Lisbon School of Economics & Management
Universidade de Lisboa

U LISBOA
UNIVERSIDADE DE LISBOA

KEY SYSTEMS APPLICATIONS

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Learning Goals

- Students will be able to:
  - Describe and analyze IT in the context of society and organizations
  - Propose, select, choose and build solutions of IT infrastructure and **IT applications**
  - Reflect and evaluate IT management and development

Table of Contents

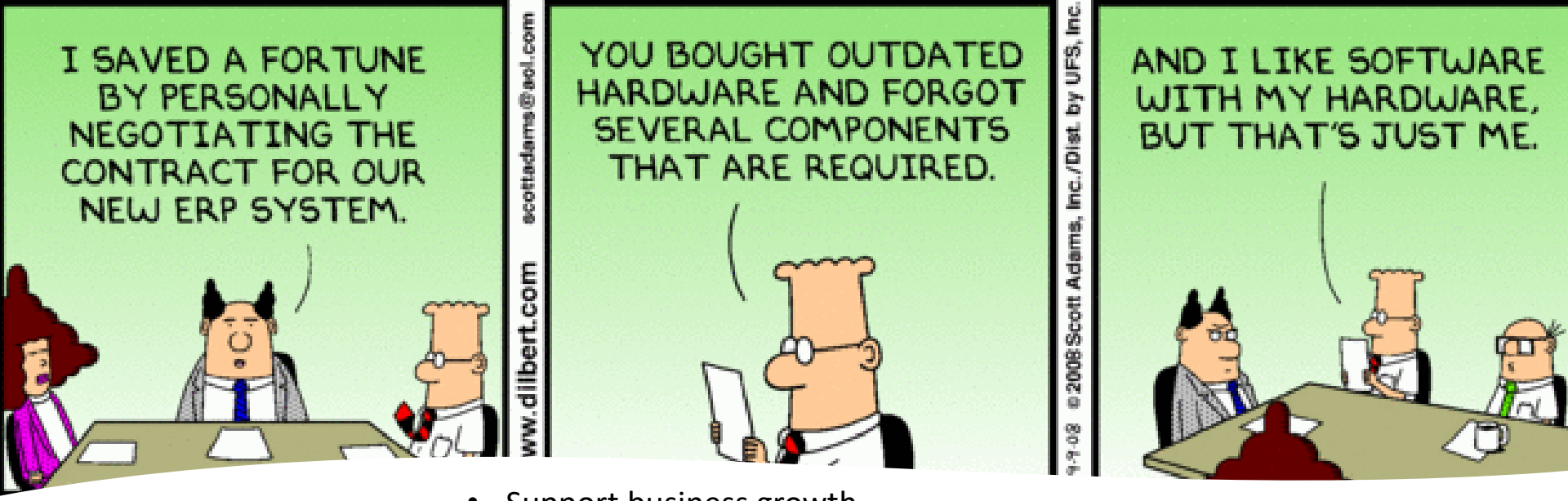
Enterprise Applications

ERP Evolution

1960s	• Inventory Control Packages
1970s	• Material Resource Planning (MRP)
1980s	• Manufacturing Resource Planning (MRP II)
1990s	• Enterprise Resource Planning (ERP)
2000s	• ERP II (Internet-enabled), Cloud ERP
2010s	• ERP processes data in real-time, machine learning, IoT

Concept

- *Enterprise Resource Planning*
- Set of very integrated programs
- Information is introduced just once in the system
- Allows integration of information and processes supported in information
- Is supported in DBMS
- Customizable



Advantages of ERP

- Support business growth
- Change Legacy systems
- Improve business processes
- Reduce maintainance
- Reduce administrative Costs
- Prevent input of redundact data
- Decrease stoks maintance costs
- Decrease data entrance errors
- Multi currency systems are possible
- Decrease system operation costs
- Prevent delays and error in client orders
- Integrate applications
- Standardize processes

Figure 1: Magic Quadrant for Cloud ERP for Service-Centric Enterprises

ERP: larger International Players

ERP: Portuguese Players

ERP Open Source

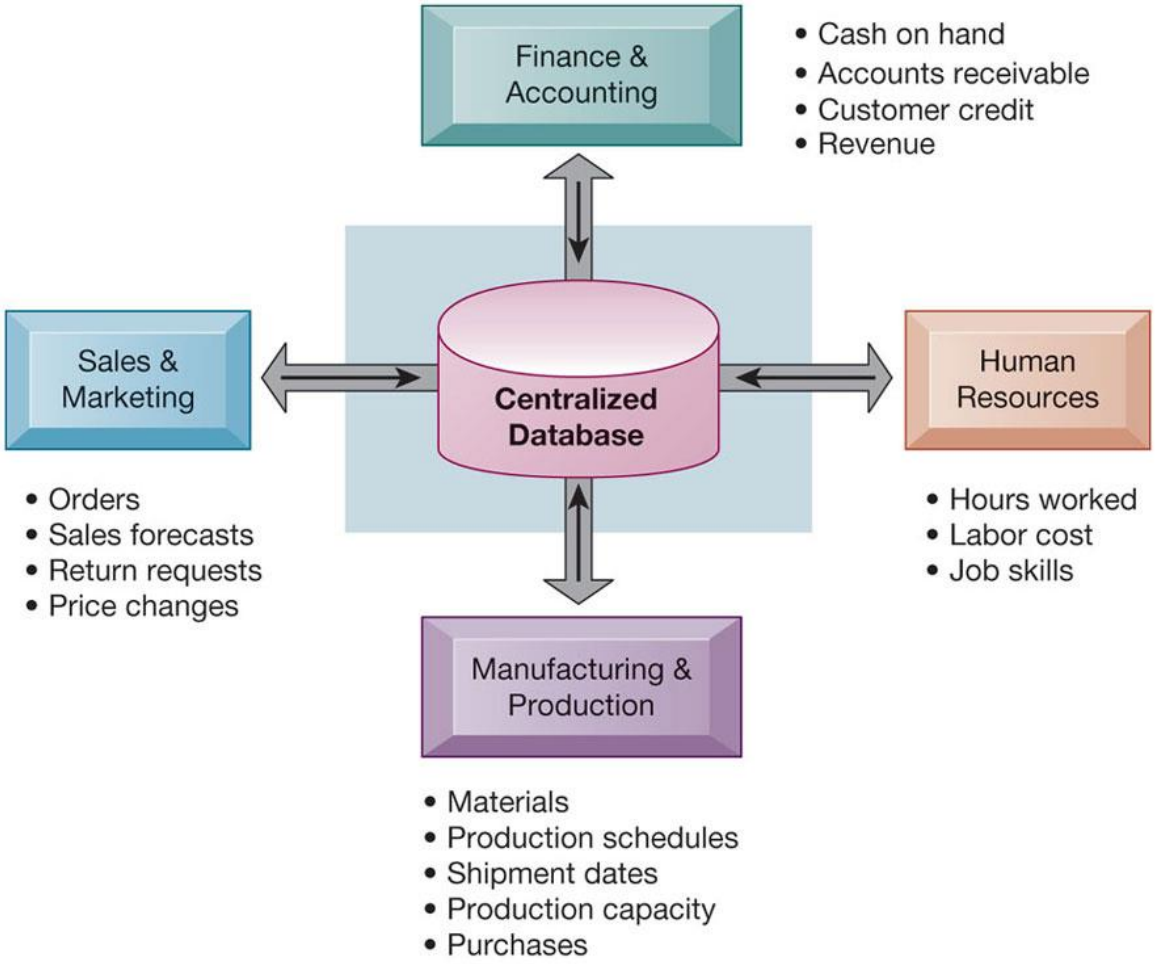
Invoice software certification (Portugal)

- Law:
  - Portaria n.º 363/2010, de 23 de Junho
  - Portaria n.º 22-A/2012, de 24 de janeiro
  - Portaria n.º 340/2013, de 22 de novembro
  - Especificação dos requisitos técnicos – Despacho n.º 8632/2014 de 03 de julho, do Diretor-Geral da AT
  - http://info.portaldasfinancas.gov.pt/pt/apoio_contribuinte/CertificacaoSoftware.htm
- List of certified software
  - https://www.portaldasfinancas.gov.pt/pt/TC/Out/consultaProgCertificadosM24.action?&pagina=22

Invoice

- *Invoice*
- Legal definition**(código art. 36º CIVA)**
  - **http://info.portaldasfinancas.gov.pt/pt/informacao_fiscal/codigos_tributarios/civa_rep/iva36.htm**
- Issueing of copy of invoice till 5 days after transaction
- Data and numbers sequencial order
- Name of company, Address and Tax Number
- Quantities and Item names
- Price without taxes and tax rate applied
- Date where itens were supplied to client

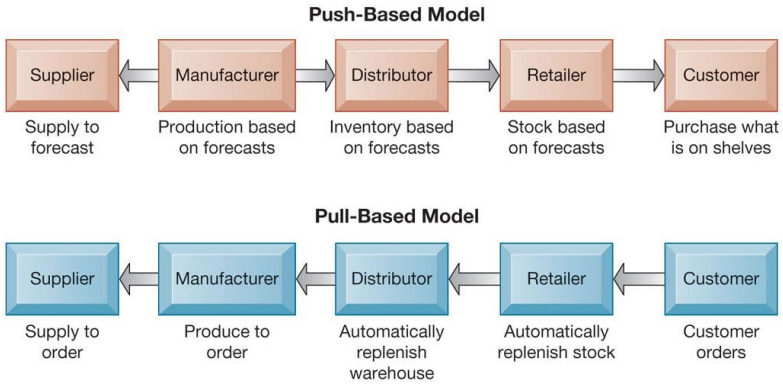
Enterprise systems

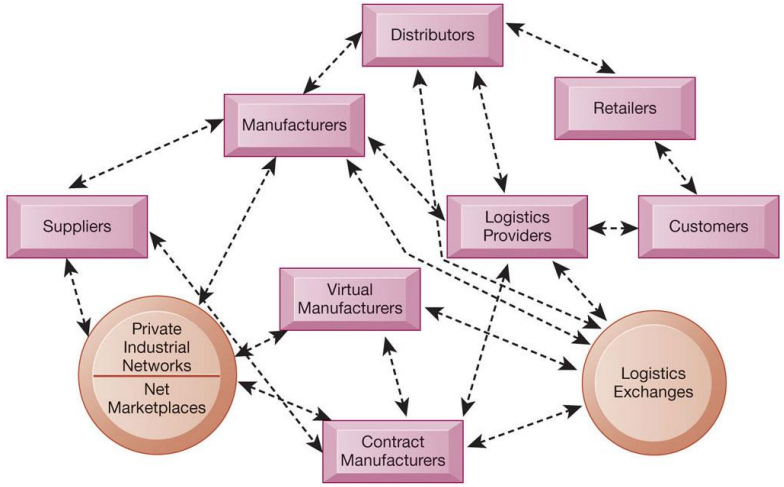


Supply chain management systems

- Supply chain planning systems
  - Model existing supply chain
  - Enable demand planning
  - Optimize sourcing, manufacturing plans
  - Establish inventory levels
  - Identify transportation modes
- Supply chain execution systems
  - Manage flow of products through distribution centers and warehouses

How do supply chain management systems coordinate planning, production, and logistics with suppliers?





- Match supply to demand
- Reduce inventory levels
- Improve delivery service
- Speed product time to market
- Use assets more effectively
  - Total supply chain costs can be 75 percent of operating budget
- Increase sales

Challenges

Customer Relationship Management (CRM)

Types of CRM

- Operational CRM
  - Marketing automation
  - Sales automation
  - Customer service
- Analytical CRM
  - data, analysis, and reporting
- Collaborative CRM
  - Contact management
  - Channel management

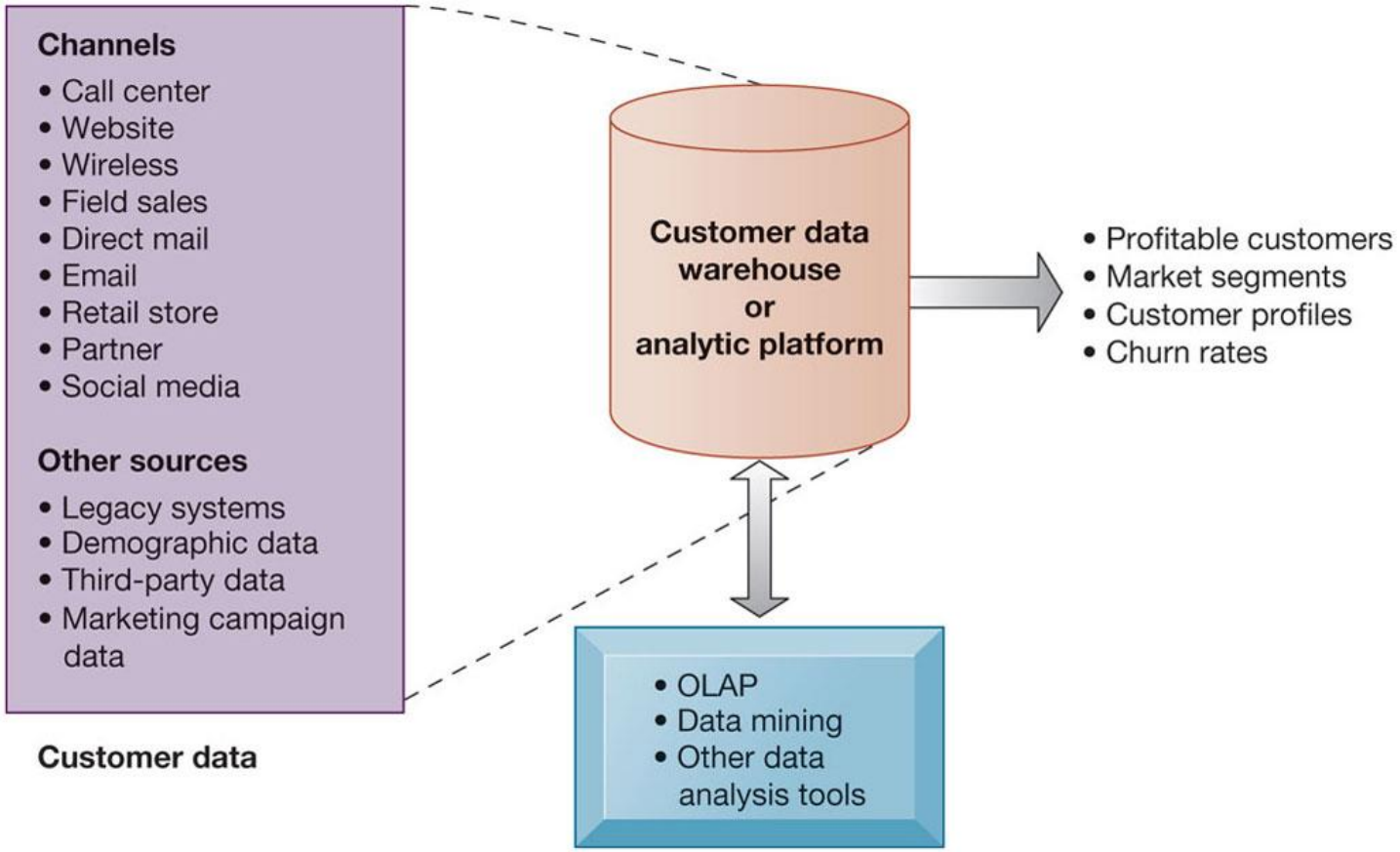
CRM Delivery Processes (1)

- Campaign Management
  - To generate leads or potential clients
- Sales Management
  - To convert lead into potential clients
- Service Management
  - Provide ongoing support for the client and assist in the operation of product or services
- Complaint Management
  - To improve customer satisfaction

CRM Delivery Processes (2)

- Market Research
  - Focuses on systematic design, collection, analysis and reporting of data relative to sales activity
- Loyalty Management
  - Provides the processes to optimize the duration and intensity of relationships with customers
- Customer Profiling
  - Marketing profile of every customer
- Feedback Management
  - Gather, analyze and share customer information

Analytical CRM



CRM Software

Source: Gartner (June 2021)

E-commerce

Features of e-commerce

- Internet and digital markets have changed the way companies conduct business
- Information asymmetry reduced
- Search and transaction costs reduced
- Dynamic pricing enabled
- Switching costs
- Delayed gratification
- Disintermediation

Trends

- Augmented Reality Shopping Experiences
- Blockchain For Supply Chain Transparency
- Customized Loyalty Programs
- Eco-Friendly E-Commerce
- Stronger Security And Privacy Measures
- More Personalized Subscription Models

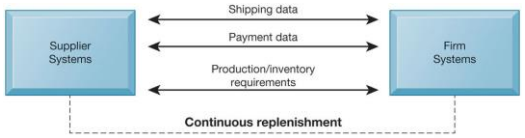
M-commerce

- M-commerce in 2017 is 35 percent of all e-commerce
- Fastest growing form of e-commerce
  - Growing at 20 percent or more per year
- Main areas of growth
  - Mass market retailing (Amazon, eBay, etc.)
  - Sales of digital content (music, T V, etc.)
  - In-app sales to mobile devices

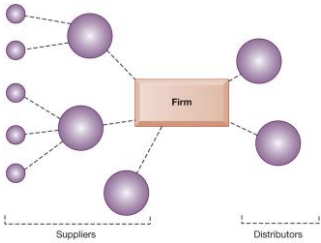
How has e-commerce transformed marketing?

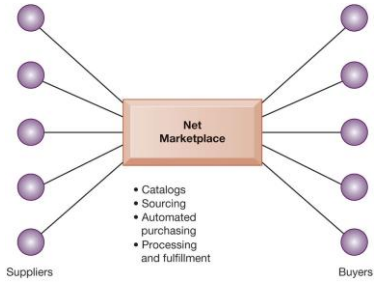
- Internet provides new ways to identify and communicate with customers
- Long tail marketing
- Internet advertising formats
- Behavioral targeting
  - Tracking online behavior of individuals
- Social commerce

How has e-commerce affected business-to-business transactions?

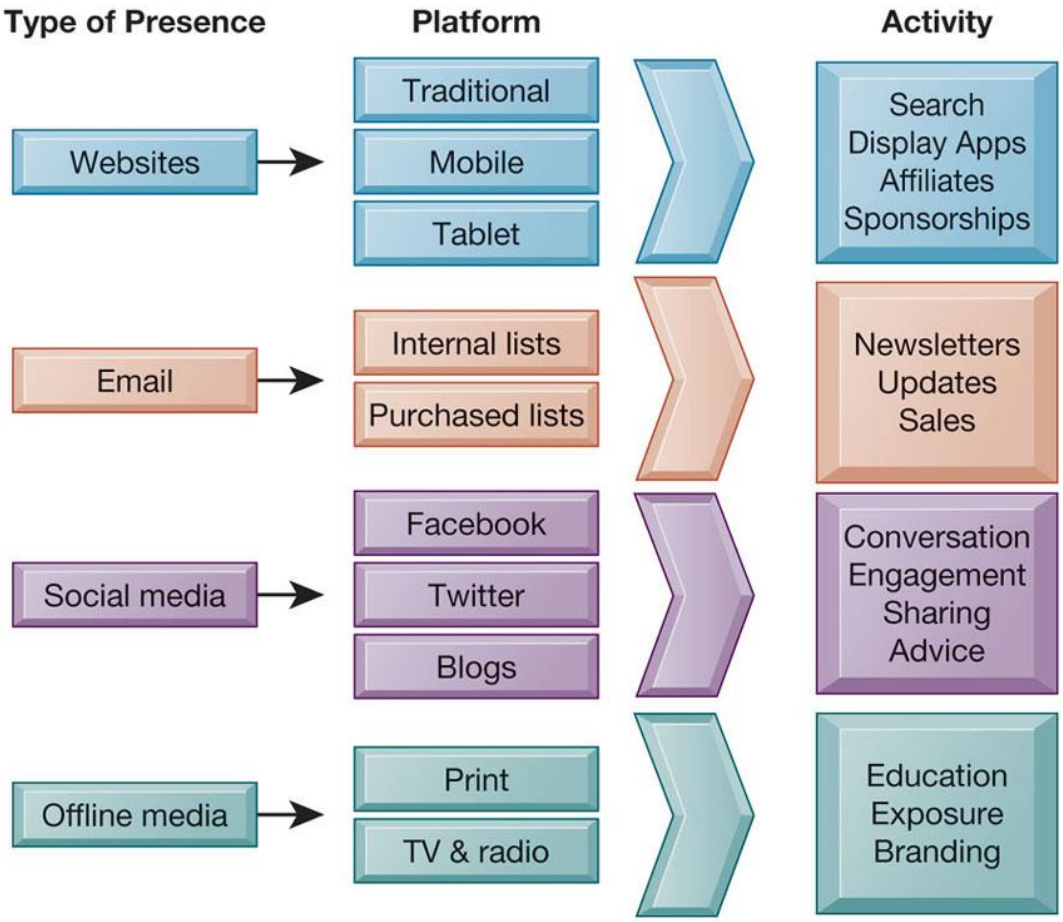


- U.S. B2B trade in 2020 was $14.5 trillion
  - U.S. B2B e-commerce in 2019 is $6.7 trillion
- Internet and networking helps automate procurement
- Variety of Internet-enabled technologies used in B2B
  - Electronic data interchange (EDI)
  - Private industrial networks (private exchanges)
  - Net marketplaces
  - Exchanges





What issues must be addressed when building an e-commerce presence?

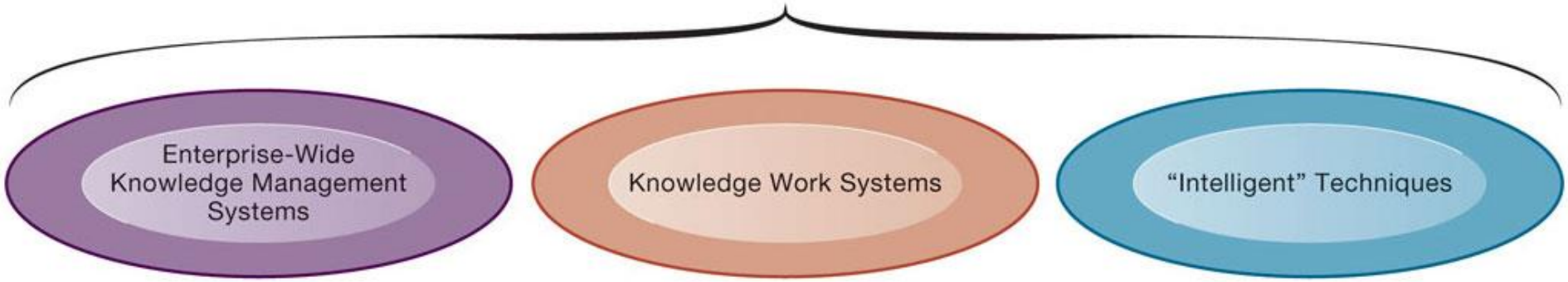


Managing Knowledge and Artificial Intelligence

Knowledge Management Systems

- Knowledge management systems among fastest growing areas of software investment
- Information economy
  - 37 percent U.S. labor force: knowledge and information workers
  - 55 percent U.S. GDP from knowledge and information sectors
- Substantial part of a firm's stock market value is related to intangible assets: knowledge, brands, reputations, and unique business processes
- Well-executed knowledge-based projects can produce extraordinary ROI

Types of Knowledge Management Systems



General-purpose, integrated, firmwide efforts to collect, store, disseminate, and use digital content and knowledge

Enterprise content management systems
Collaboration and social tools
Learning management systems

Specialized workstations and systems that enable scientists, engineers, and other knowledge workers to create and discover new knowledge

Computer-aided design (CAD)
Virtual reality

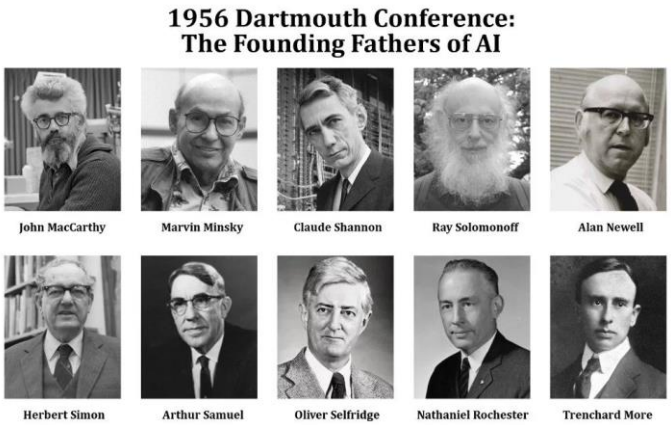
Tools for discovering patterns and applying knowledge to discrete decisions and knowledge domains

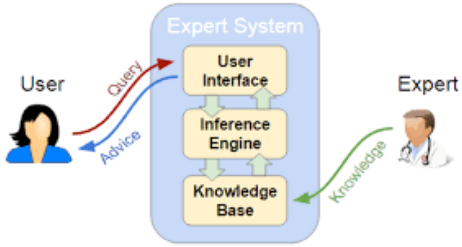
Data mining
Neural networks
Expert systems
Machine learning
Natural language processing
Computer vision systems
Robotics
Genetic algorithms
Intelligent agents

WHAT IS A.I.?

Artificial intelligence

- refers to the development of computer-based solutions that are able to perform tasks which mimic human intelligence.





Symbolic AI

Euristic Search

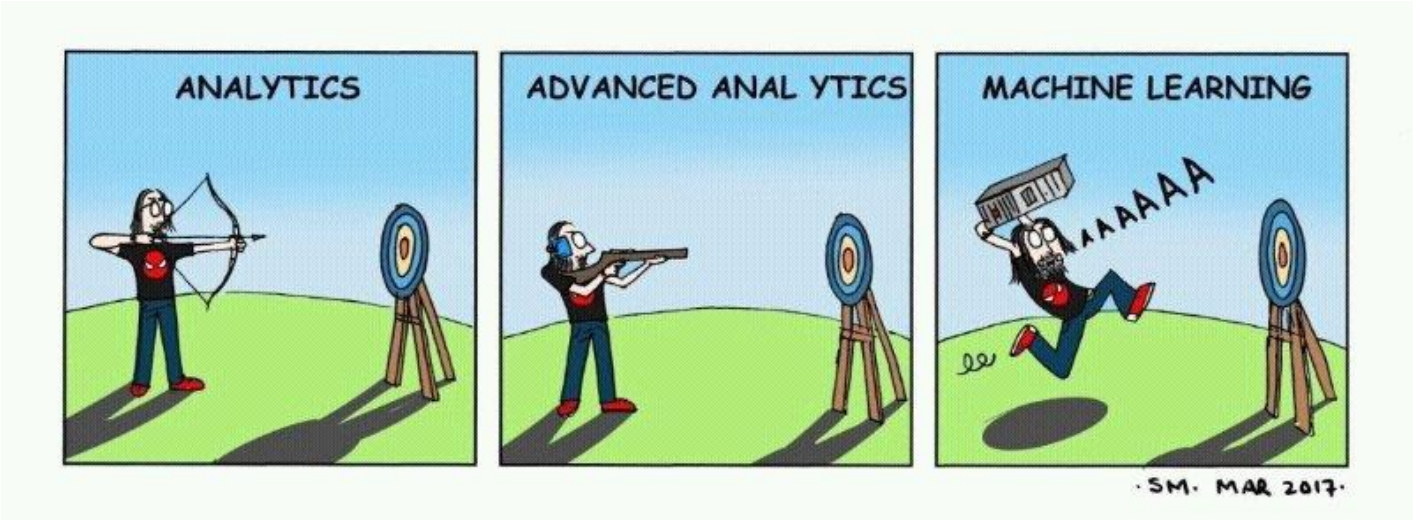
Winter 1

Expert Systems

Knowledge Engineering

Winter 2

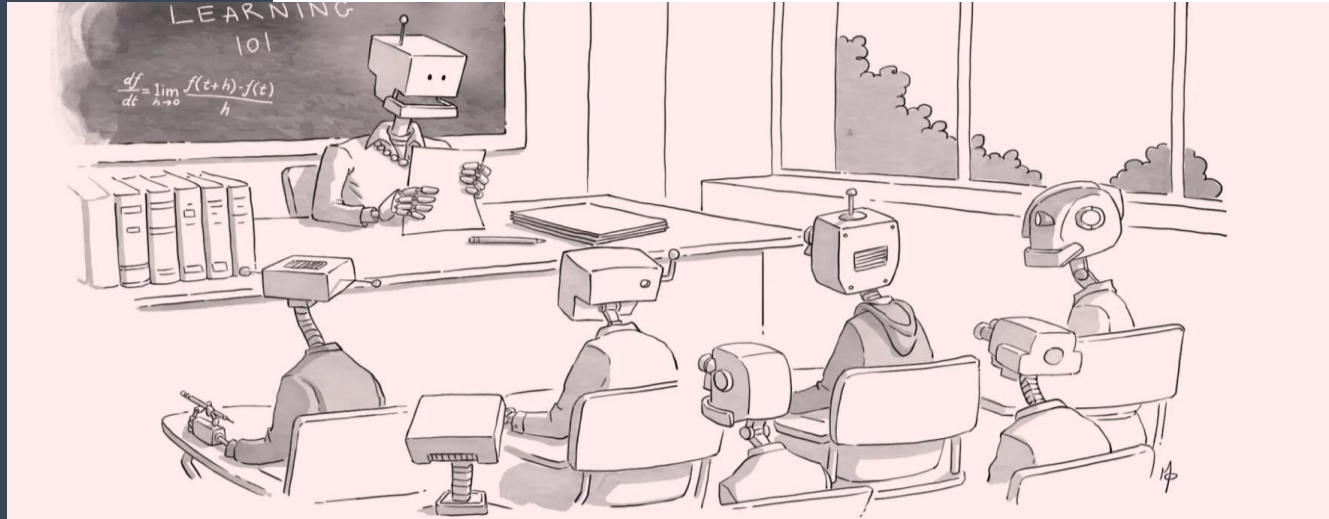
1950 1960 1970 1980 1990 2000 2010 2020



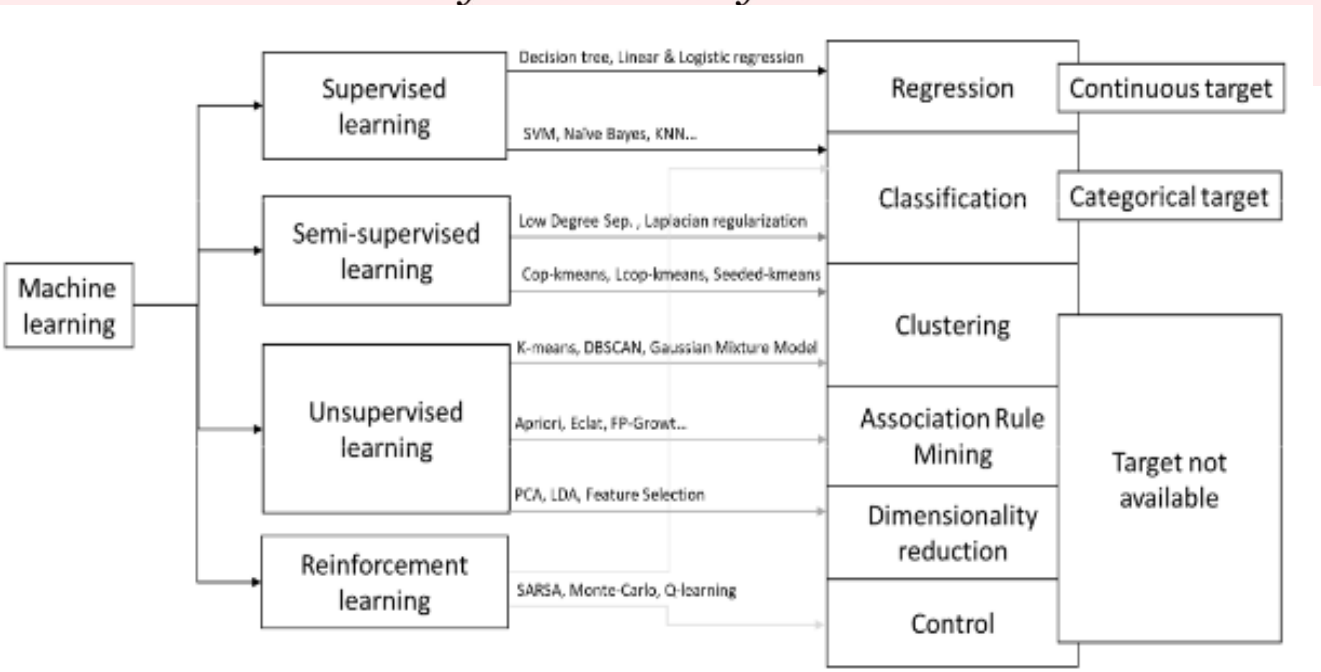
Machine Learning

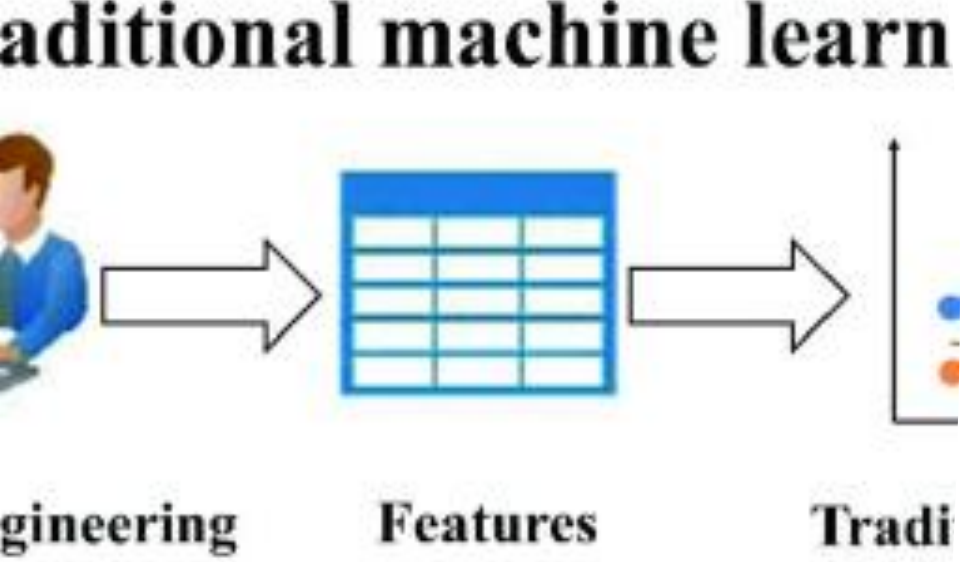
- It is as a subset of artificial intelligence that enable systems to learn patterns from data and subsequently improve from experience.

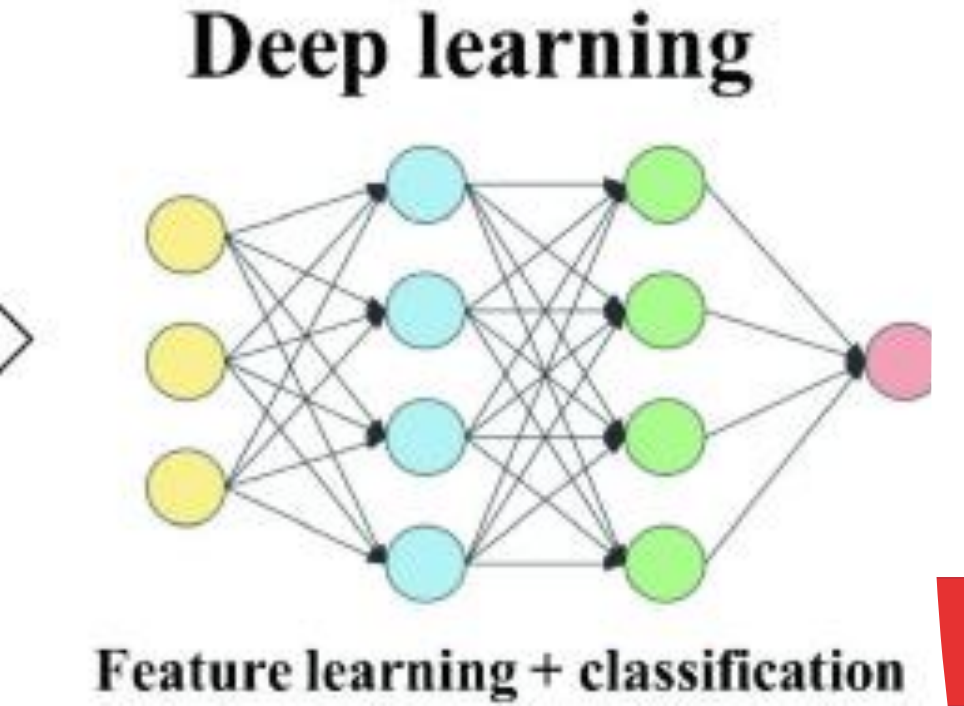
Machine Learning Algorithms



"Be sure to turn in your Turing tests before the end of class."







Deep learning

- is a subfield of machine learning
- focuses on the development and application of artificial neural networks, particularly deep neural networks.
- composed of layers of interconnected nodes (artificial neurons) that can learn and make decisions.
- The term "deep" refers to the use of multiple layers in the neural network.

Generative AI

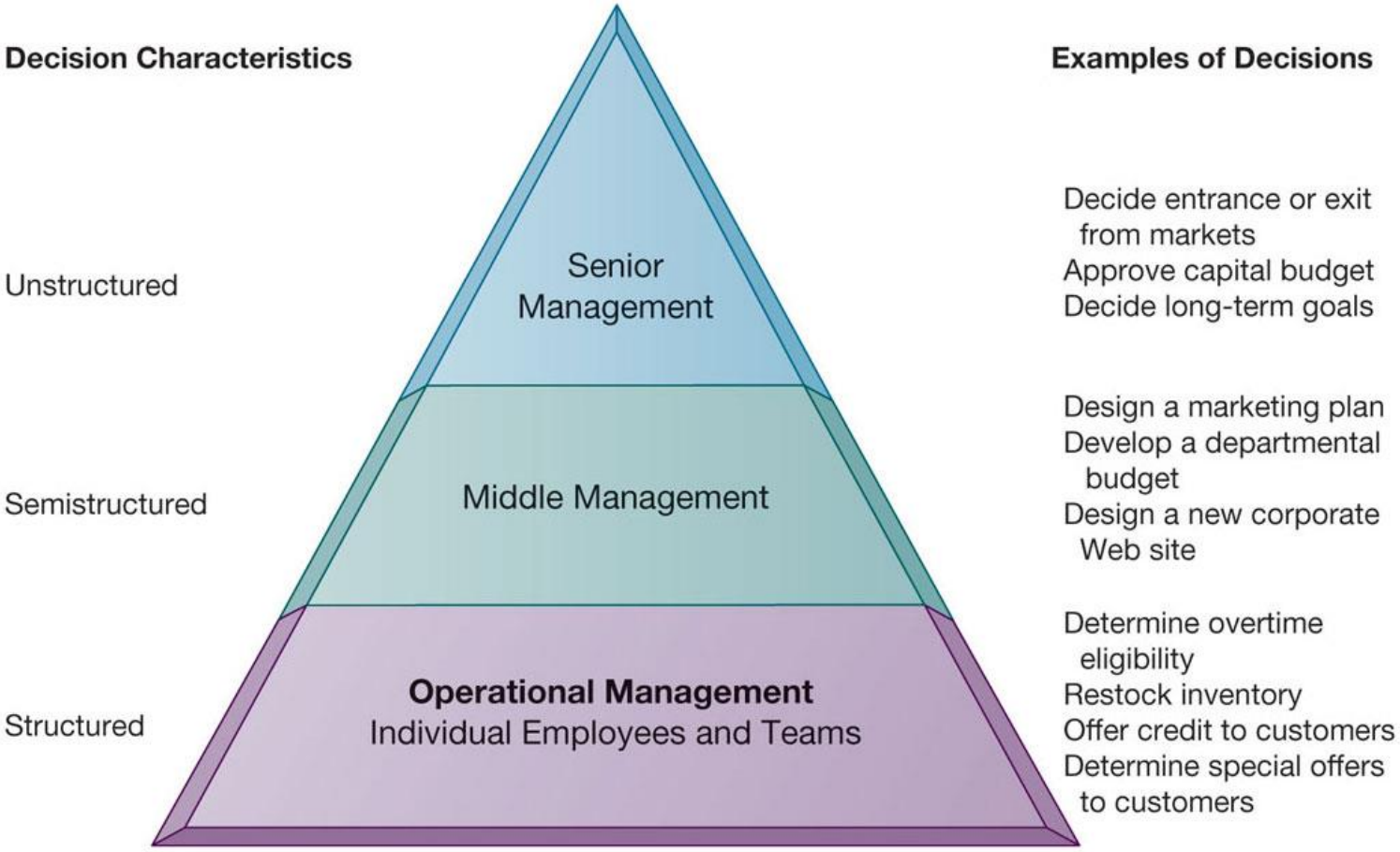
- Class of AI algorithms and models that are designed to generate new, original content.
- Gen AI learn the underlying patterns and structures in the data and can generate novel outputs.
- *Instead of being trained on specific examples and then making predictions or classifications*
- These models are particularly good at creating content that resembles or is similar to the data they were trained on.

Generative AI

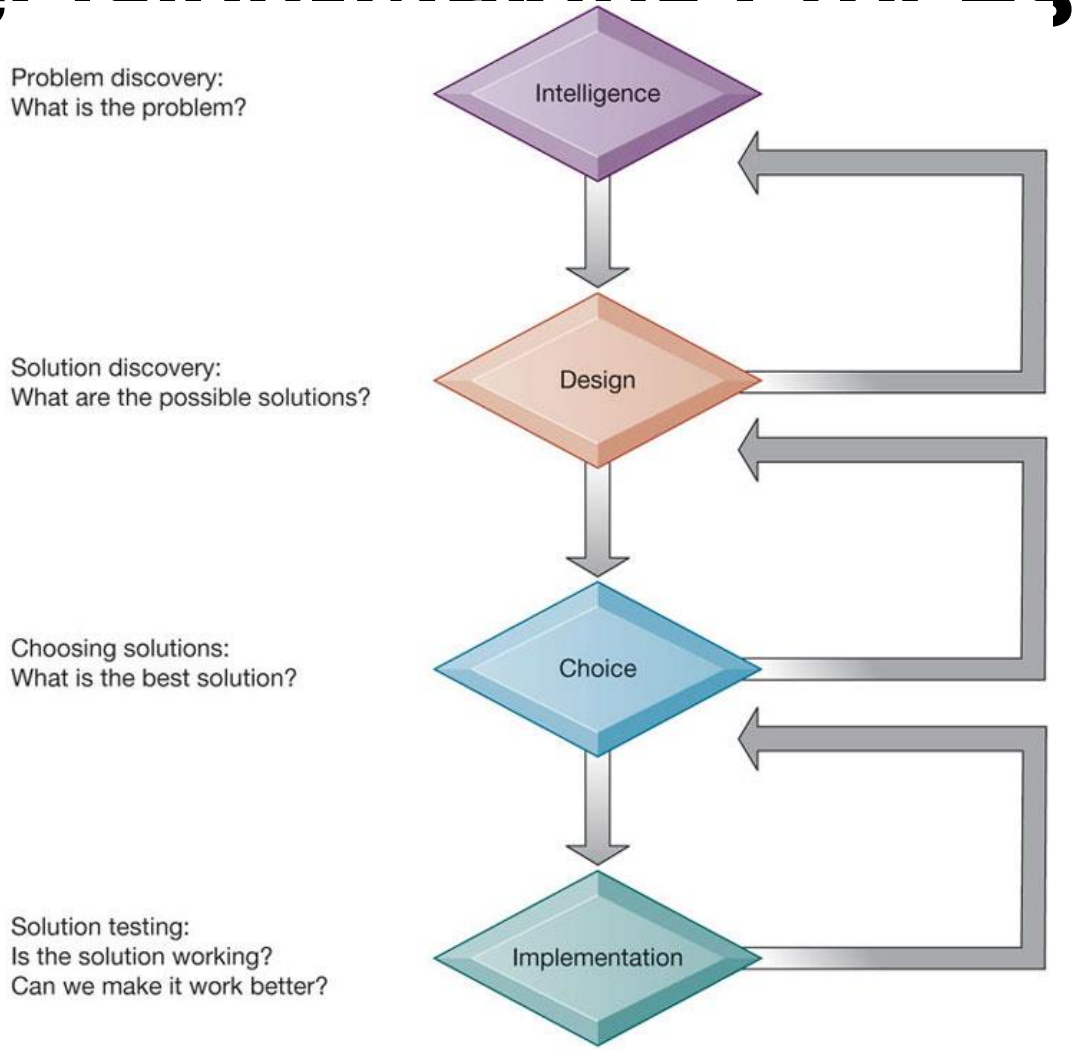
- Impacts of Generative AI
- Do your job? Replacing you?

Enhancing Decision Making

Types of Decisions



The Decision-Making Process

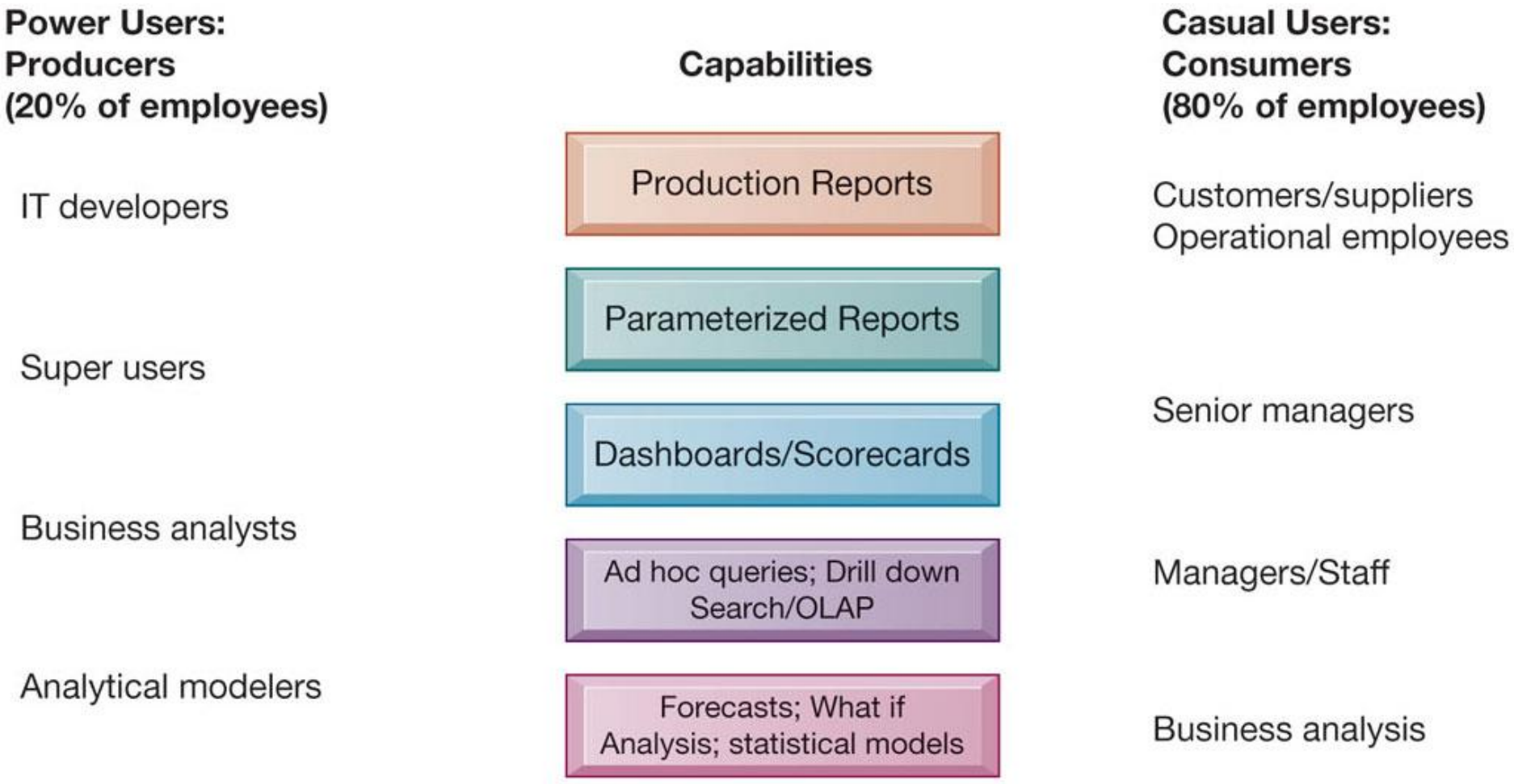


information systems & decision making

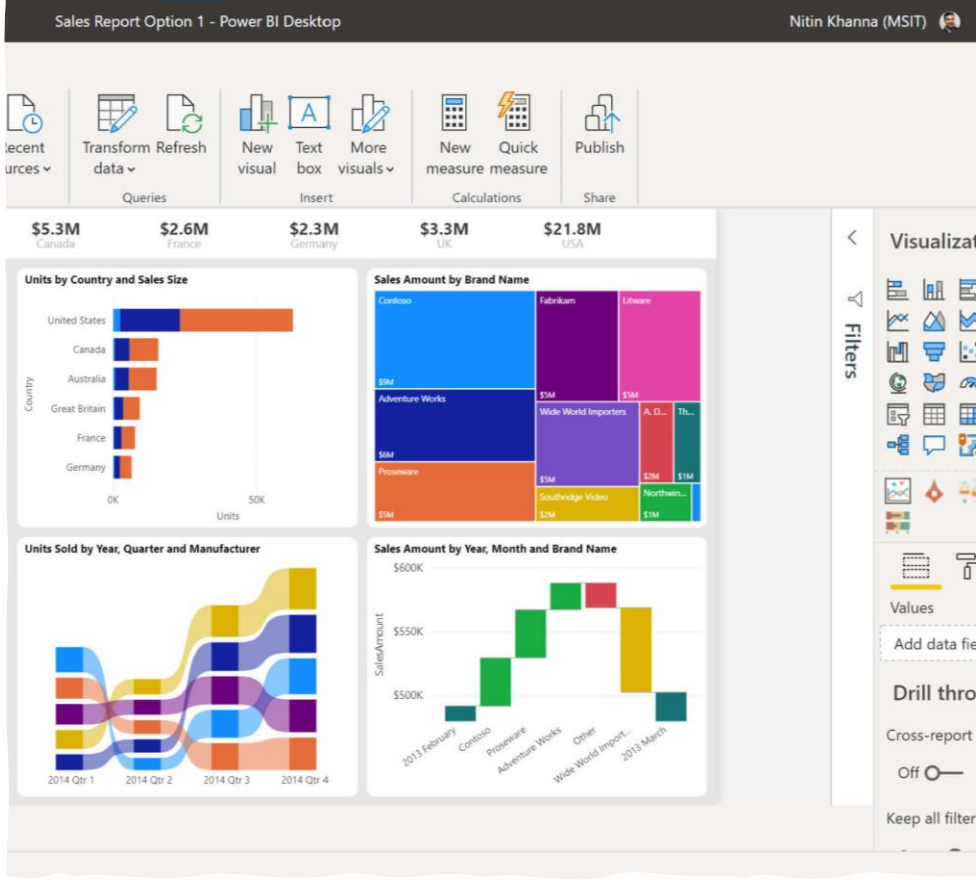
Three main reasons why investments in IT do not always produce positive results

- **Information quality**
  - High-quality decisions require high-quality information
- **Management filters**
  - Managers have selective attention and have variety of biases that reject information that does not conform to prior conceptions
- **Organizational inertia and politics**
  - Strong forces within organizations resist making decisions calling for major change

Enhancing Decision Making



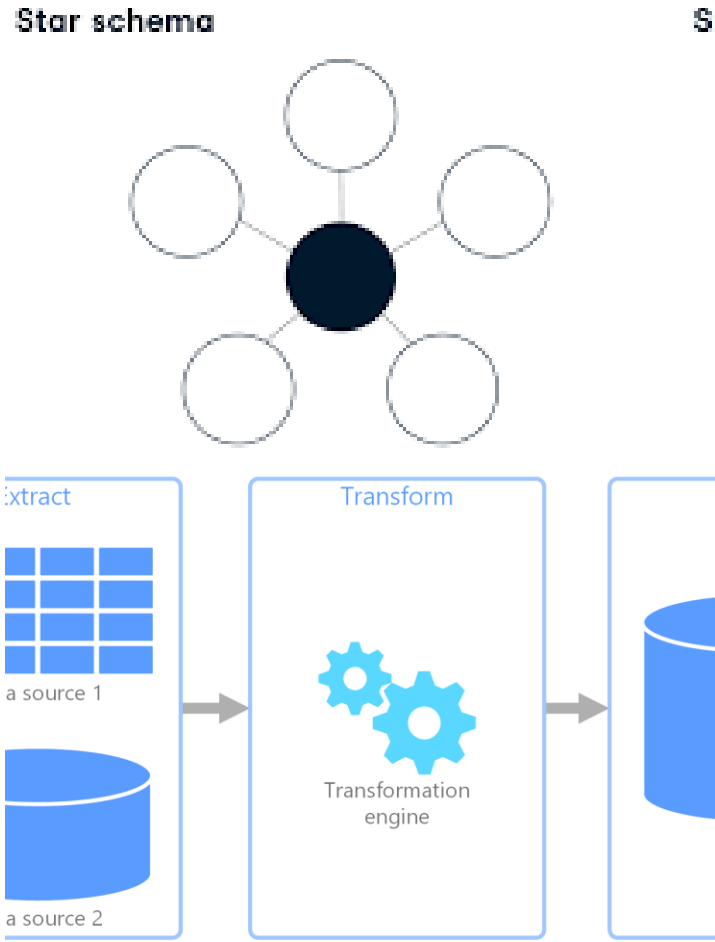
Power BI



- Create Dashboards
- Developed by Microsoft

Business Intelligence

- ETL – Extract Transform and Load
- Schema
- Types



Next Session

- IT in Business and Society
- IT Infrastructure
- Key Systems Applications
- **Build and Manage Systems**

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