Informasjonssystemer

Chapter 1: An introduction to information systems

Informations systsem (IS): a set of interrelated components that collect, manipulate, store, and disseminate data and information and provide a feedback mechanism to meet an objective.

Information concepts:

- **Data:** raw facts
- **Information:** a collection of facts organized and processed so that they have additional value beyond the value of the individual facts.
- **Process:** a set of logically related tasks performed to achieve a defined outcome
- **Knowledge :**the awareness and understanding of a set of information and ways that information can be made useful to support a specific task to reach a decision. (understanding relaionship in information)
- **Knowledge workers (KWs):** are people who create, use , and disseminate knowledge and are usually professionals in science, engineering, business, etc.
- **Knowledge management system (KMS)**: is an organized collection of people, procedures, software, databases, and devices used to create, store, and use the organization's knowledge and experience.

The characteristics of valuable information:

- The value of information is directly linked to how it helps decision makers achive their organization's goals.
- **Valuable information:** complete, secure, simple, economical, relevant, etc.

Intranet vs. Extranet:

- Intranet: Internal network that allows people within an organization to exchange information and work on projects.
- Extranet: a network based on web technologies that allow selected outsiders, such as business partners and customers, to access authorized resources of a compays intranet.

System concepts:

- **System:** is a set of elements or components that interact to accomplish goals. The elements themselves and the relationship among them determine how the system works. The system have *inputs, processing mechanisms, outputs and feedback.*
- **System example:** washing a dirty car
    - **Inputs:** dity car, water, and various cleaning ingredients time, energy, skill and knowledge also serve as inputs to the system because they are needed to operate it).
    - **Processing mechanisms:** first select washing program and communication with the machine.
    - **Feedback:** how clean the car is. Feedback depends on where in the washing process the car is.
    - **Output:** clean car

System performance and standards

- **Efficiency:** a measure of what is produces divided by what is consumed.
    - Example: the efficiency of a motor is the energy produced divided by the energy consumed
- **Effectiveness:** a measure of the extent to which a system achieves its goals.
    - Example: a company might want to achieve a net profit of 100millions for the year using a new information system. Actual profit is maybe 85 millions. In this case the effectiveness is 85%.
- **System performance standard:** a specific objective of the system
    - Example: a system performance standard for a manufactoring process might be to provide no more than 1 percent defective parts.

What is an information system?

- **An information system (IS)** is a set of irrelated elements or components that collect (input), manipulate (process), store, and disseminate (output) data and information and provide a corrective reaction (feedback mechanism) to meet an objective. The feedback mechanism is the component that helps organizations achieve their goals, such as increasing profits or improving customer service.
- **Input:** the activity of gathering and capturing raw data
- **Processing:** Converting or transforming data into useful outputs.
- **Output:** Production of useful information
- **Feedback:** output that is used to make changes to input or processing activities.
- **Forecasting:** predicting future events to avoid problems

Manual and computerized information systems

Computer-based information systems (CBIS): a single set of hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information. Here are the components of a CBIS:

- **Hardware:** the physical components of a computer that perform the input, processing, storeage, and output activities of the computer.
- **Software:** the computer programs that govern the operation of the computer
- **Databases:** an organized collection of facts and information
- **Telecommunication:** the electronic transmission of signals for communicatios.
- **Networks:** to able electronic communication
- **Internet:** the worlds largest computer network. (intranet and extranets)
- **People and Procedures**

Business information systems (BIS): are often integrated in one product and can be delivered by the same software package. Here are some BIS:

- **Electronic and mobile commerce:**
    - **e-commerce:** any business transaction executed electronically between:
        - companies (business-to-business, B2B)
        - companies and consumers (business-to-consumers, B2C)
        - consumers and other consumers (consumer-to-consumer, C2C)
        - business and the public sector
        - consumers and the public sector
    - **mobile commerece (m-commerce):** the use of mobile, wireless devices to place orders and conduct business.
    - **electronic business (e-business):** using information system and the internet to perform all business related tasks and functions.
- **Enterprice systems:**
    - **Transaction processing systems (TPS):** an organized collection of people, procedures, software, databases, and devices used to perform and record business transactions. A transaction is any business-related exchange such as payments to employees, sales to customers, or payment suppliers.
    - **Enterprise resource planning (ERP):** a set of integrated programs capable of managing a company's vital business operations for an entire multisite, global organization.
- **Information and decision support systems**
    - **Management information systems (MIS):** an organized collectio of people, procedures, software, databases and devices that provide routine information to managers and decision makers.
    - **Decision support systems (DSS):** n organized collectio of people, procedures, software, databases and devices used to support problem-specific decision making.
- **Specialized business information systems:**
    - Knowledge management, Artificial intelligence, Expert systems, Virtual reality

System development: the activity creating or modifying business systems

- **System investigation:** understanding problem
- **System analysis:** understanding solutions
- **System design:** select and plan best solution
- **System implementation:** place solution into effect
- **System maintenance and review:** evaluate results of solution

Information systems in society, business and industry

- Security, privacy, and ethical issues in information systems and the internet
- Computer and information systems literacy
- Information systems in the functional areas of business
- Information systems in industry

Global challenges in information systems

- Computer literazy and information system literacy:

- Computerr literacy: knowledge of computer systems and equipment and the ways they function
- Information system literacy: knowledge of how data and information are used by induviduals, groups, and organizations. This is important to know how to apply systems to busines to increase revenue reduce costs, inccrease efficiency, etc..

- Benefits from using informations systems: increase revenue, reduce costs, increase information flow and/or availability, increase security.

Chapter 2: Information systems in organizations

Oranizations and information systems:

- **Organization:** a formal collection of people and other resources established to accoplish a set of goals.
- **Value chain:** a series (chain) of activities that includes inbound logistics, warehouse and storage, production, finished product storage, outbound logistics, marketing and sales, and customer service.
    - Supply chain management (SCM)
    - Customer relationship management (CRM)
- **Supply chain:** the link between value chains. A supply chain is a system of product or services from supplier to customer.

- Organizational structure: organizational subunit and the way they relate to the overall organization.

- **Traditional organizational structure:** an organizational structure in which the hierarchy of decision making and authority flows from the strategic management at the top down to operational management an nonmanagement employees.
    - **Flat organizational structure:** reduced number of layers from bottom to top.
    - **Empowerment:** giving employees and their managers more responsibility and authority to make decisions. take certain actions, and have more control over their jobs.
- **Project and team organizational structures:** a structure centered on major products or services.
    - **Team organizational structure:** a structure centered on work teams or groups.
- **Virtual organizational structure and collaborative work:** a structure that uses individuals, groups, or complete business units in geographically dispersed areas; these groups can last for a few weeks or years.

- Thee stage organizational change model:

- **unfreezing:** Ceasing old habits and creating a climate that is respective to change.
- **Moving:** learning new work methods, behaviors, and systems
- **Refreezing:** involves reinforcing changes to make the new process second nature, accepted and a part of the job.

- Organizational culture and change:

- **Culture:** a set of major understandings and assuptions shared by a group.
- **Organizational culture:** the major understandings and assuptions for a business, corporation, or other organizations.
- **Organizational change:** how for-profit and nonprofit organizations plan for, implement and handle changes
- **Change model:** a representation of change theories that identifies the phases of change and the best way to implement them.
- **Organizational learning:** the adaptions to new conditions or adjustments based on experience and ideas over time.

- Reengineering and continuous improvement:

- **Reeingeneering (process redesign):** the radical redesign of business processes, organizational structures, informations systems, and values from the organization to achieve a breakthrough in business results.
- **Continuous improvement:** constantly seeking ways to improve business processes to add value to products and services

- User satisfation and technology acceptance:

- **Technology acceptance model (TAM):** a model that describes the factors leading to higher levels of acceptance and usage of technology
- **Technology diffusion:** a measure of how widely technology is spread throughout the organization.
- **Technology infusion:** the extent to which technology is deeply integrated into an area or department (hvor høyt/lavt i hierarkiet).

- Quality: the ability of a product or service to meet or exceed customer expectations.
- Total quality management (TQM): involves a keen awareness of customer needs, adopting strategic vision for quality, empowering employees, and rewarding employees and managers for producing high quality products.
- Six sigma: is a business management strategy, originally developed by Moterola. It is a statistical term that means products and services will meet quality standard 99.9997 of the time. (six standardderivations).

Outsourcing, on-demand computing, and downsizing:

- **Outsourcing:** contracting with outside professional services to meet specific business needs
- **On-demand computing:** is an extension of the outsourcing approach. On-demand computing, also called on-demand business and utility computing, involved rapidly respond to an organization's flow of work as the need for computer resources varies.
- **Downsizing:** reducing the number of employees to cut costs

Competitive advantage

Competitive advatage: A significant and ideally long-term benefit to a company over its competition.

Factors that lead firms to seek competitive advantage:

- **(five-forces model):** a widely accepted model that identifies five key factors that can lead attainment of competitive advantage, including:
    1. the rivalry among existing competitors:
    2. the threat of new entrants
    3. the threat of substitute products and services
    4. the bargaining power of buyers
    5. the bargaining power of supplieres

Strategic planning for competitive advantage

- **Cost leadership:** deliver the lowest possible cost for products and services.
- **Differentiation:** deliver different products and services. This strategy can involve producing a varity of products, giving customers more choices, or delivering higher quality products or services.
- **Niche strategy:** deliver to only a small, niche market.
- **Altering the industry structure:** change the industry to become more favorable to the company or organization.
    - **Strategic alliance/partnership:** an agreement between two or more companies that involves the joint production and distribution of goods and services
- **Creating new products and services:** introduce new products or services periodically or frequently
- **Improving existing product lines and services**
- **Other strategies:**

Performance-based information systems

Productivity: is a measure of the output achived divided by the input required

Return of investment and the value of information systems:

- **Return on investment (ROI):** one measure of IS value that investigates the additional profits or benefits that are generated as a percentage of the investment in IS technology.
    - **Earnings growth:** another measure of IS value is the increase in profit, or earnings growth, the system brings.
    - **Market share and speed to market:** is a percentage of sales that products or services has in relation to the total market. If installing a new online catalog increases sales, it might help a company increasing its market share by 20%.
    - **Customer awareness and satisfaction**
    - **Total cost of ownership (TCO):** is the sum of all costs over the life of the information system, including the costs to acquire components such as the tehcnology, technical support, administrative costs, and end-user operations.

Careers in information systems

Roles, functions, and careers in IS

- Operations
- System development
- Support
- Information service units

Typical IS titles and functions

- Chief information officer (CIO)
- LAN administrators
- Internet careers

Working in teams

- Tota cost of ownership: the sum of all cost over the life of the information system.

- Chief information officer (CIO): employs the IS department's equipment and personnel to help the organization attain its goals.

Chapter 8: Electronic and Mobile Commerce

Electronic and Mobile Commerce

- **Mobile commerce (m-commerce):** relies on the use of mobile, wireless devices, such as cell phoness and smart phones, to place orders and conduct business.

- Electronic Commerce (e-commerce): Conducting business activities (e.g distribution, buying, selling, marketing, and serviceing of products or services) electronically over computer networks.

- Business-to-business (B2B) E-Commerce: a subset of e-commerce in which all the participants are organizations
- Busuness-to-consumer (B2C) E-Commerce: a subset of e-commerce in which customers deal directly with an organization and avoid inermediaries.
- Consumer-to-consumer (C2C) E-Commerce: a subset of e-commerce that involves consumers selling directly to other consumers.
- e-Government: the use of information and communications technology to simplify the sharing of information, speed formerly paper-based processes, and improve the relationship between citizens and government

- **Buy-side e-commerce:** an organization that purchases products and services from its suppliers.
- **Sell-side e-commerce:** the organization sells the products to its consumers.

- Multistage model for E-Commerce:

- **Search and identification:** kjøper må kunne velge og søke i ønskede produkter.
- **Purchasing products and services electronically:** velge ønskede produkter og diskutere pris og levering. Det å diskutere pris og levering er en typisk B2B. Ved B2C er det ofte "take it or leave it".
- **Purchasing:** betale for valgte produkter/tjenester. Dette gjøres ofte litt andeledes og det er B2B eller B2C. B2B er ofte faste kunder og betales mest sannsynlig ikke med kredittkort, men sendes ofte en automatisk regning til firma. En vanlig B2C kunde vil vanligvis betale sine produkter ved hjelp av et kredittkort.
- **Product and service delivery:** noen produkter er levert elektronisk, som feks musikk, video, bilde, etc, mens noen produkter/tjenester må leveres på andre måter.
- **After-sales service:** lagrer informasjon om kunden slik at de kan hjelpe kunden etter slaget. Dette kan være at kunden ikke er fornøyd med produktet, ikke får det til eller annet. Her har de salgshistorie og kundeservice som kan svare på spørsmål.

- E-Commerce challenges

- Defining an effective e-commerce model:
- Dealing with consumers Privacy concerns
- Overcoming consumers Lack of trust
- Overcoming Global issues

- **Identity theft:** someone using your personally idenifying information without your permission to commit fraud or other crimes. Tips for online shoppers to avoid identity theft are:

- Se om nettstedet bruker autoriserte sikre betalingstjenester
- Se om nettstedet bruker sikker overføring:https
- Ikke oppgi personlig informasjon til usikre kilder
- The website policy for return of products
- Before downloading, check the browsers advanced settings to disable access to all computer areas.

-Thrust building strategies for an organization to gain the thrust of consumers:

- Give first buy price
- Demonstrate that the company have been in the business for a long time
- Provide brand endorsements from wll known experts or well respected individuals
- Demonstrate participation in approperiate regulary programs or industry associations

- Overcoming global issues:

- Cultural challenges
- Language challenges
- Time and distance challenges (customer service)
- Infrastructure challenges (wide varity of hardware and software devices)
- Currency challenge (prices and payment)
- State, regional, and national law challenges (trademarks, patents, products, taxes and fees)

Electronic and Mobile Commerce Applications

- Retail and wholesale: "If you sell your products directly to the end user whether through eBay, a website, craft shows or in a storefront, then you probably sell retail.
If you sell your products to a middleman who then sells them to the consumer, then you sell wholesale.

- Manufactoring:

- **Electronic exchange** Is a electronic forum where manufacturers, suppliers, and competitors buy and sell goods, trade market information, and run back-office operations.

- Marketing:

- **Market segmentation:** the identification of specific markets to target them with advertising messages.
- Det var vanskelig å finne nok informasjon om bruker, men nå har **Nielsen(marketing and media information company)** laget en "business-facts" database som inneholder informasjon om 13millioner businesser.

- Advertising: Cost pr click, cost pr action, etc

- Price comparison
- Couponing

- **Wireless Application Protocol:** standard sett av spesifikasjoner for internett applikasjoner sokjører på håndholdte, trådløse devices.

Threats to electronic and mobile commerce

- Security
- Theft of intellectual property: includes works of the mind such as books, films, music, processes, and software, which are unique and are owned or created by a single entity
- **Click fraud:** a problem arising in a pay-per-click online advertisig environment where additional clicks are generated bayond those that com from actual, legitimate users
- Clickstream data: the data gathered based on the web sites you visit and the items you click.
- Man må følge regler til alle land når man selger ting på nett
- Man må følge regler for taxes

- Maintaining and improving your web site:

- Rapporter viser at kunder forventer at tjenestene/opplevelsene på nett skal være bedre enn eller lik som i butikk.
- Irriterende om ting går tregt eller ikke fungerer--> kan miste kunder av det
- Trender kommer og går, dette må følges med på!
- Personalization --> feks personlig reklame
- Technological advances

- Digital Certificates and certificate authorities: er et viktig ledd for å kunne tilby sikker

betaling til kunder gjennom mobile devicer.

- **Digital certificate:** an attachment to an e-mail message or data embedded in a web site that verifies the identity of a sender or web site
- **Certificate authortity(CA):** a thrusted third party organization or company that issues digital certifiactes

- Electronic payment systems:

- **Credit card:** har en beløpsgrense basert på brukerens credit-historie. Brukeren betaler tilbake i etterkant, men må betale renter om det ikke skjer raskt nok.
- **Charge card:** nesten det samme som kredittkort, men har ingen beløsgrense.
- **Debit card:** som kredittkort, metrekker pengene med en gang fra konto.
- **Smart card:** som kredittkort, me med microchip for bedre sikkerhet
- **P-card:** et kort som vanligvis gis ut til utvalgte ansatte spm kan inneholde en beløpsgrense eller andre restriksjoner. Betalingsoversikten blir overvåket.

- **Technology infrastructure required to successfully implement e-commerce within an organization:**

- Hardware
- Server OS
- Web server software
- E-commerce software
- High-speed connection to network
- Electronic payment systems

Chapter 9: Enterprise Systems

- Enterprise system: a system central to the organization that ensures information can be shared across all business functions and levels of management to support the running and managing of a business.

Transaction Process systems

- Data processing:

- Batch processing system: is a form of data processing whereby business transactions are accumulated over a period of time and prepared for processing as a single unit or batch
    - Can be used to update employee earnig records, create checks,
- Online trasaction processing: a form of data processing where each transaction is processed immediately, without the delay of accumulating transactions into a batch
    - Can be used by airlines, ticket agencys, stock investment firms, etc.

- A TPS typically includes the following types of systems:

- Order processing systems
- Accounting systems
- Purchasing systems

- Transaction Processing Activities

- Data collecting: capturing and gathering all data necessary to complete the processing of transactions
- Data editing: the process of checking data for validity and completeness
- Data correlation: the process of reentering data that was not typed or scanned properly
- Data manipulation: the process of performing calculations and other data transformations related to business
- Data storage: the process of updating one or more databases with new transactions
- Document production: the process of generating output records and reports.

- TPS for small and medium size enterprises (SME's)

- Employees between 50 and 250
- The TPS for SME's needs to be easy to install and operate, low cost of ownership

Enterprise resource planning and customer relationship management

- Enterprise resource planning (ERP): is a set of integrated programs that manage a company's vital business operations for an entire organization.

- Advantages of ERP:

- Improved access to data for operational decision making
- Elimination of costly, inflexible legacy programs
- Improvement of work process
- Upgrade of technology infrastructure

- Disadvantages of ERP systems

- Expense and time in implementation
- Difficulty implementing change
- Difficulty integrating with other systems
- Difficulty in loading data into new ERP systems
- Risks in using one vendor
- Risk of implementation failure

- Supply chain management (SCM): a system that includes planning, executing, and controlling all activities involved in raw material sourcing and procurement, converting rawmaterials to finished products, and warehouse and delivering finished product to consumer.

- SCM busniess process: inbound movement of raw materials → supplier → manufacturer → outbound movement of finished products → wholesaler → retailers → end customers
- Material requirement planning (MRP): determine the amount of timing for replacing raw material orders with suppliers.
    - Ensure materials are available for production and products are available for delivery to customers.
    - Maintain the lowest possible material and product levels in store
    - Plan manufacturing activities, delivery schedules and purchasing activities.
    - Purchasing uses the information from MRP to place purchase orders for raw materials with quantified suppliers. Typically, purchase orders are released so that raw materials arrive just in time to be in production and minimize warehouse and storage costs
    - MRP answears this:
        - *What* items are required?
        - *How many* are required?
        - *When* are they required?
    - Examples of problems:
        - If a company purchases insufficient quantities of an item used in

manufacturing (or the wrong item) it may be unable to meet contract obligations to supply products on time.
    - If a company purchases excessive quantities of an item, money is wasted
    - Beginning production of an order at the wrong time can cause customer deadlines to be missed.

- Financial and managerial accounting and ERP

- A general ledger is a book containing all the accounts for recording transactions relating to a company's assets, liabilities, owners' equity, revenue, and expenses. In modern accounting softwares or ERP, the general ledger works as a central repository for accounting data transferred from all subledgers or modules like accounts payable, accounts receivable, cash management, fixed assets, purchasing and projects. The general ledger is the backbone of any accounting system which holds financial and non-financial data for an organization.
- Financial accounting consists of capturing and recording all the transactions that affect a company’s financial state and then using these documented transactions to prepare financial statements to external decision makers, such as stockholders, suppliers, banks, and government agencies. These financial statements include the profit and loss statement, balance sheet, and cash flow statement.
- Managerial accounting involves using “both historical and estimated data in providing information that management uses in conducting daily operations, in planning future operations, and in developing overall business strategies”.

- Business Intelligence and ERP

- Customer Relationship Management (CRM): a system that helps a company manage all aspects of customer encounters, including marketing and advertising, sales, customer service after the sale, and programs retain loyal customers. Benefits can be improved customer satisfaction, increased customer retention, reduced operating costs and the ability to meet customer demand.

- International issues with for multinationa corporations must address in planning, building and operating their ERP systems:

- Different languages and culture:
    - Languages → forskjellig
    - Culture → different workprocess (teams etc)
    - Globale organisasjoner som opererer worldwide trenger ofte dyre skreddersydde systemer.
- Disparties in information infrastructure:
    - Telecommunications → some countries does not provide a fast communication lines and inexpencive customer service
    - Bare strømforsyning kan være forskjellig og skape problemer!
- Varying laws and customs rules
    - Recording of worker performance data er i noen land ikke lov
    - Dataprotecction makes limits for sharing data
    - Import and export (flow of goods)
- Multiple currencies
    - transaksjoner må føres i forskjellige enheter.
    - Translating from one currency to another

Chapter 10: Information and Decision Support Systems

Decision making and problem solving

- Decision making is a part of the problem solving phase. The decision making includes intelligace,design and choice stage. The problem solving phase consists of the decision making phase + implemation stage and monitoring stage:

- Intelligence stage: identify and define potetial problems or oppertunities
- Design stage: develop alternative solutions to the problem and evaluate their feasibility
- Choice stage: requires selecting a course of action
- Implementation stage: a solution is put into effect
- Monitoring stage: the final stage of the problem solving process, in which decision makers evaluate the implementation

- **Decision making vs problem solving:** decision making is the first part of problem solving, including three stages: intelligence, design and choice. Problem solving includes and goes beyond decision making. It also include implementation stage, when the solution is put into effect.

- Programmed vs. nonprogrammed decisions:

- Programmed decisions: a decision made using a rule, procedure, or quantitive method.
- Nonprogrammed decisions: a decision that deals with unusual or exceptional situations.

- Structured vs. unstructured problem:

- Structured problem: are repetitive and routine decisions and have a definite procedure for handling them. Structured decisions do not have to be treated as if they are new.
- Unstructured problems: nonroutine decisions in which the decision maker must provide judgement. Evaluation, and insight into the problem definition; there is no agreed upon procedures for making such decisions.

- Optimizzation, Satisficing, and Heuristic Approaches

- Optimization model: a process to find the best solution, usually the one that will best help the organization meet its goals
- Satisficing model: a model that will fina a good, but not necessarily the best, solution to the problem. Why not always use the optimization model? It can often be to costly in tim or money to use a optimization model, and the satisficing model will bee “good enough”.
- Heuristics: commonly guidelines or procedures that usually find a good solution.

Management Information Systems (MIS)

- Management Information System (MIS): is an integrated collection of people, procedures, databases, and devices that provides managers and decision makers with information to help achive organizational goals. The goal is to provide the right information to the right people in the right format at the rigth time.

- Input to a MIS: the most significant internal data sources for an MIS are the organizations various TPS and ERP systems.

- Outputs of a MIS: the outputs of a MIS is a collection of reports that are distrubuted to managers.

- Scheduled Reports: a report produced periodically, such as daily, weekly, or monthly. Key-indicator report summarizes the previous day's critical activities.
- Demand Reports: a report developed to give certain information at somone's request rather than on a schedule
- Exception Reports: a report automatically produced when a situation is unusual or requires management action
- Drill-Down Reports: a report providing increasingly detailed data about a situation

- Functional aspects of the MIS

- Financial MIS: an information system that provides financial for executives and for a broader set of people who need to make better decisions on a daily basis.
    - integrate financial and operatioanl information
    - provide easy access to data for users
    - Make financial data immediately available
    - enable analysis of financial data along multiple dimensions
    - Analyze historical and current financial activity
    - profit/loss ans cost systems
- Manufacturing MIS
    - Design and engineering: manufactoring companies often use computer-aided design with new or existing products
    - Master production scheduling: scheduling production and controlling inventory are critical for any manufacturing company
    - Inventory control: most techniques are is used to minimize inventory costs.
    - Process control: managers can use a number of technology to control and streamline the manufacturing process
    - Quality control and testing: a process that ensures that the finished product meets the customers goal.
- Marketing MIS: an information system that supports managerial activites in product development, distribution, pricing decisions, promotional effectivness, and sales forecasting. Location analysis in a marketing research MIS: her kan man promotere riktig

reklame til personer når personer befinner seg ved de respektive stedene.
- Human Resource MIS: an information system that is concerned with activities related to previous, current, and potentional employees of an organization.
- Accounting MIS: an information system that provides aggregate information on accounts payable, accounts receivable, payroll, and many other applications
- Geographical information system (GIS): a computer system capable of assembling, storing, manipulating, and displaying geographical information, that is, data identified according to its location.

Decision Support Systems (DSS)

- Decision Support System (DSS): is an organized collection of people, procedures, software, databases, and devices used to help make decisions and solve problems.
Karakteristikker: Rask tilgang til mye informasjon, begandler MYE data fra forskjellige kilder, tilbyr rapporter og presentasjoner når det trengs,tekstilig og grafisk fremstillinger og støtter "drilldown" analyse.
- **Data-driven DDS:** kvalitativ analyse basert på organisasjonens database
- **Model-driven DDS:** kvantitativ og matematiske analyser

- Capabilities of a Decision support system:

- Components of a Decision support system:
- Database
- The model base: part of a DSS that allows managers and decision makers to perform quantitive analysis on both internal and external data.
- Model Management software (MMS): software that coordinates the use of models in a DSS
- The User Interface
- Access to the internet, networks and other computer-based systems

- DDS and social networks

Group Support Systems (GSS)

- **Group Software Systems (GSS):** is a software application that consists of most elements in a DSS, plus software to provide effective support in group decision making

- GSS vs DSS: GSS skal (som DSS) letteregjøre besluttningsprosesser, men her med fokus på gruppesamarbeid og gruppebeslutninger

- GSS og sosiale nettverk: man kan hente inn mye objectiv data fra andre parter til hjelp i besluttningsprosesser

Executive Support Systems (ESS)

- **DSS:** An organized collection of people, procedures, software, databases, and devices working to support managerial decision making.

- **ESS:** Specialized decision support systems designed to meet the needs of senior management.

- **(WIKIPEDIA) An executive information system (EIS):** is a type of management information system intended to facilitate and support the information and decisionmaking needs of senior executives by providing easy access to both internal and external information relevant to meeting the strategic goals of the organization. It is commonly considered as a specialized form of decision support system (DSS).

- Fundamental uses of an executive support system:

Chapter 11: Knowledge Management and Specialized Information Systems

Knowledge Management Systems

- Knowledge Management System (KMS): is an organized collecyion of people, procedures, software, databases, and devices used to create, store, share, and use the organizations knowledge and experience.

- Different types of knowledge:

- **Explicit knowledge:** is objective and can be measured and documented
- **Tacit knowledge:** er erfaring som ikke er lett og dokumenteres og må ofte oppnås via erfaring.

- Community of practice: a group of people dedicated to a common discipline or practice, such as open-source software, auditing, medicine or engineering

- Chief knowledge officer (CKO): top-level executive who helps the organization work with a KMS to create, store and use knowledge to achive organizational goals. The CKO is responsible for the organizations KMS and typically works with other executives and vice presidents.

Artificial Intelligence

- Artificial Intelligence systems: include the people, procedures, hardware, software, data, and knowledge needed to develop computer systems and machines that demonstrate characteristics of intelligence.

- Intelligent Behaviour: the ability to learn from experiences and apply knowledge aquired from those experiences, handle complex situations, solve problems when inportant imformation is missing, determine what is important and to react quickly and correctly to a new situation, understand visual images, process and manipulate symbols, be creative an imaginitive, and use heuristics.

- Robotics: the development of mechanical or computer devices that perform tasks requierng a high degree of precision or that are tedious or hazardious for humans

- Vision systems: the hardware and software that permit computers to capture, store, and

manipulate visual images.

- Natural language processing: processing that allows the computer to understand and react to statements and commands made in a "natural" language, such as english. voice recognition involves converting sound waves into words. After converting sound into words, natural language processing systems react to the words.

- Learning systems: a combination of software and hardware that allows the computer to change how it functions or reacts to situations based on feedback it receives.

- Neural Networks: a computer system that can act like or simulate the functioning of a human brain.

Expert Systems

- Expert system: beahves similary to a human expert in a particular field.

- **Knowledge base**
- **Inference engine:** part of the expert system that seeks infformation and relationships from the knowledge base and provides answears, predictions, and suggestions similar to the way a human expert would.
- **Explanation facility:** component of an expert system that allows a user or decision maker to understand how the expert system arrived at certain conlustions or results.
- **Knowledge acquisition facility:** part of the expert system that provides a convenient and efficient means of capturing and storing all the components of the knowlegde base.
- **User interface**
- **Experts and users**

- Participants in developing and usig expert systems:

- **Domain expert:** the person in the group with the expertise or knowledge the expert system is trying to capture.
- **Knowledge engineer:** a person who has training or experience in the design, development, implementation, and maintainance of an expert system.
- **Knowledge user:** the person or group who uses and benefits from the expert system.

- Rules vs cases: Rules are IF-THEN statements, cases are examples of other similar happenings and the conclusion from those cases

Multimedia and virtual reality

Specialized Systems

- Game theory:

- **Informatics:** a specialized system that combines traditional disciplines, such as science and medicine with computer systems and technology (bioinformatics and geoinformatics)

- RFID: radiofrequency identification er små chips som kan inneholde informasjon som raskt kan scannes. Kan for eksemple brukes til å merke varer i en container slik at man raskt får en oversikt over innholdet.

- Eagle eyes: et system for å overkomme fysiske handicap. Man kan styre et elektronisk system med å hodet eller øyne.

- Segway: Elektronisk scooter som