Web Engineering

Lecture 5

Web Based Applications Architecture

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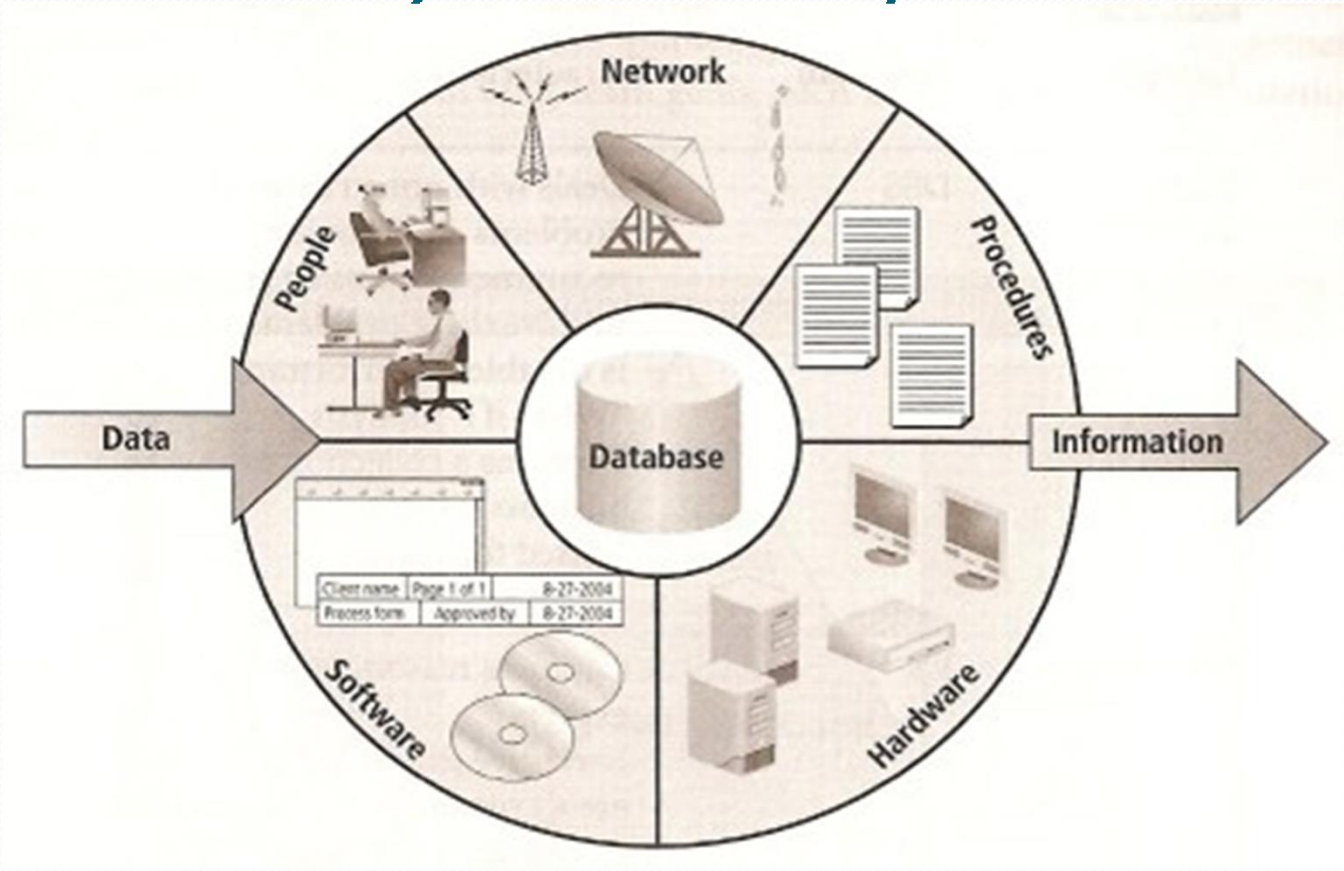
Information System

- A collection of components that work together to process **data** into accurate **information** using the information processing cycle
- **Information processing cycle –** involves:
  - **Input**
  - **Processing**
  - **Output**
  - **Storage**

Information System Components

- The main components of an information system are:
  - **Data** – collected data and facts used as inputs for system processing
  - **Procedures** – manual procedures, guidelines, business rules, and policies implemented in the system
  - **Hardware** – computer systems and devices
  - **Software** – applications, operating systems, and any other utilities used
  - **Network** – communication infrastructure to connect client processes to the system
  - **People** – users, managers, database administrators, programmers, systems analysts, systems administrators

Information System Components…



Information System Usage

- A collection of components that work together to process **data** into accurate **information**
- Can be categorized based on usage
  - **Lower-level management** – uses information system to assist management and employees with operational tasks like inventory systems
  - **Middle-level management** – uses information systems that deal with midterm goals like forecasting
  - **Upper-level management** – works with information systems that assist with long-term decision-making goals

Information System Usage…

Information System Usage Categories

- Information systems are classified mainly into the following distinct categories based on their usage:
  - **Transaction-processing systems (TPS)** – used for operational tasks like order tracking, customer service, payroll, etc
  - **Decision-support systems (DSS)** – used for tactical management tasks like sales forecasting, risk management, etc
  - **Expert systems (ES)** – captures reasoning of human experts like loan experts, market analysts, etc

Architecture

- High-level plan or strategy for building applications
- Can have a number of tiers (usually up to 5 tiers)
  - The tiers may place **data management**, **application logic**, and the **user interface** into separate processes or combine them in some manner

One-Tier Architecture

- Combines data management, application logic, and the user interface into a single executable file
- Many old data processing applications like COBOL programs use this architecture
- Current desktop (PC) applications like MS Access applications also use this architecture

Two-Tier Architecture

- Organizes an application into two layers
  - **User interface layer**
  - **Data management services layer**
- The application/business logic may be in either or both layers
- Often used in conjunction with client-server computing which has:
  - **Clients** – sends requests to the server
  - **Server** – manages requests from clients

Three-Tier Architecture

- Cleanly separates data management, application logic, and the user interface into different layers
  - **User interface** – manages forms and reports
  - **Data management** – holds the database structure
  - **Application layer** – holds the application logic

Tiered Architectures