**Information systems**

**Definition, Goals, and Applications**

IS is a set of computer-based tools for collecting, storing, and processing data to provide relevant, accurate, and timely information. It automates everyday tasks and connects suppliers with customers. Components: networks, software, hardware, databases, and people.

**Types of IS**

**Transaction Processing System (TPS) –** collects, processes, and manages transactions.

**Management Information System (MIS)** – analyzes data for decision-making.

**Decision Support System (DSS)** – helps make decisions using external data.

**Expert System** – provides recommendations.

**SDLC and Its Phases**

**Analysis** – study current systems, define requirements.

**Planning** – assemble team, justify project, set schedule.

**Design** – evaluate hardware/software solutions.

**Implementation** – coding, debugging, testing, deployment.

**Maintenance** – update system, apply patches, release new versions.

**Planning Phase**  
Goal: create a project plan including scope, costs, participants, and timetable.  
Activities: assemble team, justify project, select methodology, create timetable.

**Analysis Phase**  
Goal: define system requirements.  
Activities: study current system, determine requirements, create report.

**Design Phase**  
Goal: satisfy system requirements with hardware/software solutions.

**Hardware and Software Alternatives**

**Hardware**: device needs, network type, storage (cloud/in-house), automation level.

**Software**: development tools, custom-built systems, application software, turnkey systems.

**Implementation Phase**  
Goal: develop and deploy the system.  
Activities: coding, debugging, testing, conversion.

**Types of Testing**

**System** – ensures compatibility with other software/hardware.

**Acceptance** – performed by users or analysts.

**Unit** – tests individual modules.

**Integration** – checks module interactions.

**Business-Level** – ensures compliance with requirements.

**Types of Conversion**

**Direct** – immediate switch (risky but fast).

**Parallel** – old and new systems run together.

**Phased** – step-by-step activation of modules.

**Pilot** – testing in a single branch before full deployment.

**Maintenance Phase**

Goal: verify system performance and usability.  
Activities: user support, bug fixes, system updates, backups.

**Types of Modifications**

**Major** – large-scale changes.

**Routine** – small internal adjustments.

**Emergency** – urgent fixes.

**Software Patches** – significant updates.

**Quality of Service (QoS) Metrics**

**Throughput** – data processed per unit time.

**Accuracy** – system error rate.

**Downtime** – system unavailability.

**Capacity** – user/storage limits.

**User Levels** – peak, average, and low usage.

**Response Time** – system speed in delivering data.

**Threats to IS**

Natural disasters, power outages, equipment/software failures, human errors, security breaches, malware, war.

**Protection Measures**

**Deterrents –** passwords.

**Preventive** – firewalls.

**Corrective** – hardware inventories.

**Detection** – antivirus software.