### **1 Definition of an information system, its goals, and examples of applications.**

An information system can be defined as a set of interrelated components that collect, process, store, retrieve, and distribute information to support decisionmaking, coordination, and control in an organization.

The information system is made up of five fundamental components: hardware, software, data, networks, and people.

Hardware resources consist of all physical devices and materials used for input, output, and processing of data.

Software resources not only include the programs to control and coordinate the hardware but also the procedures, which are operating instructions for the people who will use an information system.

The third component is data. By itself, data is not really very useful. But aggregated, indexed, and organized together into a(n) database, data can become a powerful tool for businesses.

Technically, communications networks are made up of hardware and software, but they are such a core feature of today's information systems that they have become its own category. Network resources include communications media, networks and network support.

The final and probably the most essential component of an information system is people without whom the previous four components can’t function. Human resources include two types of people - the end-users, also called users or clients who use an information system or the information it produces, and the information systems specialists like computer operators, analysts, programmers, etc. who develop and operate information systems.

Examples of apps:

* + Travel and Hospitality
  + Manufacturing
  + Local Government
  + Education
  + Communication
  + Health Care
  + Retail

### **2 Types of information systems and their main characteristics.**

* + DSS (Decision support system). It helps people make decisions by directly manipulating and accessing data from external sources, generating statistical projections, and creating data models of various scenarios.
  + TPS (Transaction processing system). It provides a way to collect, process, store, display, modify, or cancel transactions. Most of these systems allow many transactions to be entered simultaneously.
  + Expert system. It's sometimes referred to as a "knowledge-based system"; it's a computer system designed to analyze data and produce a recommendation, diagnosis, or decision based on a set of facts and rules.
  + MIS (Management information system). It is used to derive various reports from transaction data. Managers depend on these reports to make routine business decisions in response to structured problems.

### **3 SDLC and its core phases.**

SDLC – System Development Life Cycle.

It refers to how information systems are developed and what phases it goes throw.

Изображение выглядит как текст, Шрифт, снимок экрана, линия

Автоматически созданное описание

### **4 Planning phase, its goal, and main activities.**

Planning Phase Activities:

* Assemble the project team.
* Justify the project.
* Choose a development methodology.
* Develop a project schedule.
* Produce a project development plan.

The goal of these activities is to create a Project Development Plan. Before the project proceeds beyond the planning phase, the Project Development Plan is usually reviewed and approved by management.

This planning document includes:

- a short description of the project, including its scope.

- a justification for the project, which includes an estimate of the project costs and potential financial benefits.

- a list of project team participants.

- a schedule for the project, including an outline of its phases.

### **5 Analysis phase, its goal, and main activities.**

The goal of the analysis phase is to produce a list of requirements for a new or revised information system. Tasks for the analysis phase are listed in the box below.

Most new information systems are designed to replace a system or process that is already in place. It is important to study the current system to understand its strengths and weaknesses before designing a new system.

Some members of the project team might have first-hand experience with the current system. They can often provide an overview of the system and identify key features, strengths, and weaknesses. To obtain additional information about the current system, project team members can observe the system in action and interview people who use it.

Analysis Phase Activities:

* Study the current system.
* Determine system requirements.
* Write a requirements report.

### **6 Blockchain technology.**

A blockchain is a public ledger that records all Bitcoin transactions eliminating the need for a third party to process payments. Blocks with the most recent transactions being recorded are like an individual banking statement. Each completed block is added to the chain and another block begins forming the constantly growing blockchain. Bitcoin isn't regulated by a central authority. Instead, its users dictate and verify transactions when one person pays another for goods or services. The completed transaction is publicly recorded into the blockchain where it is verified by other Bitcoin users.

### **7 Definition of the design phase; its purpose and activities.**

In the SDLC design refers to the phase of creating a plan for building the system, including defining the requirements, interfaces, and data structures.

The design phase in the System Development Life Cycle (SDLC) involves creating a detailed plan for building the system. This includes defining requirements, interfaces, and data structures.

Activities:

* System Architecture: Determine how data will flow and be stored within the system.
* Manual Creation: Develop maintenance and user manuals for future reference.
* Customer Sign-Off: The design phase starts when stakeholders approve the plan.

### **8 Hardware and software solutions.**

* Device requirements. Servers and personal computers are the most commonly used components in information systems, but handheld devices, mainframes, and even supercomputers can also play a role. Systems analysts have to consider if users are accessing the system at the office or in the field. How much mobility is required? How much processing power and storage are required? Will screen size be an issue?
* Network technology. Virtually every information system requires a network, so the project team must examine different alternatives, such as LANs, extranets, Intranets and the Internet. Many information systems require a complex mixture of networks, such as a LAN in each branch office connected to a company Intranet, with customers accessing selected data via the Internet.
* Types of hosting. The availability of these services offers yet another hardware option that can be addressed during the design phase. Rather than install an information system on costly in-house equipment, a viable alternative might be to install it in the cloud on equipment that is maintained by a cloud hosting company such as Amazon, Microsoft or Google
* Level of automation. The project team should consider the pros and cons of different levels of automation because they affect all aspects of the planned information system.

### **9 Definition of the implementation phase; its purpose and activities.**

It’s all about turning the project plan into reality. The primary purpose is to coordinate and direct project resources effectively to meet the objectives outlined in the project plan. It transforms design specifications into working software or hardware components.

Activities:

* + Purchase and install hardware and/or software.
  + Create applications.
  + Test applications.
  + Finalize documentation.
  + Train users.
  + Convert data.
  + Convert to the new system.

### **10 Types of testing.**

1. Unit testing. Ensures that each module of the new system works correctly.
2. Integration testing. Ensures that all the modules work together correctly.
3. System testing. Ensures that new modules work with the rest of the system hardware and software.
4. Business Level testing. Is done by business analysts or professional testers to ensure it complies with requirements and predict expected result.
5. Acceptance testing. Is designed to verify that the new information system works as required; it is done by users or systems analysts often with real data.

### **11 Types of conversion.**

* Direct conversion. It means that the old system is completely deactivated, and the new system is immediately activated. It's risky, however, because if the new system doesn't work correctly, it might need to be deactivated and undergo further development or testing.
* Parallel conversion. It avoids some of the risk of direct conversion because the old system remains in service while some or all of the new system is activated. Both the old and new systems operate in parallel until the project team can determine whether the new system is performing correctly.
* Phased conversion. It works well with large, modularized information systems because the new system is activated one module at a time. After the project team determines that one module is working correctly, the next module is activated, and so on, until the entire new system is operational.
* Pilot conversion. It works well in organizations with several branches that have independent information processing systems because the new information system is activated at one branch at a time. If the new system works correctly at one branch, it is activated at the next branch.

### **12 Scope creep.**

Feature creep, more commonly known as scope creep, refers to when you add excessive features to a product that make it too complicated or difficult to use. Any additional features you introduce into your product add to the complexity of your design. In turn, this can diminish the usability of your product. Feature creep is typically the result of poor planning, insufficient product strategy, and misaligned priorities. Typically, requests for new features are added after the project has started, are out of scope, and the changes are not properly reviewed. If you're building a product for your own business, such as an app, it's important to stay focused on creating a strong minimum viable product (MVP) and ship it. You can always add features later on after you get feedback from your merchants and/or users. To help focus your project on core features, you need to: start with user and market research; identify your target audience, their needs, and their wants; know what problem you are solving, and for what user. Prioritize all features in your product according to the needs of your users.

### **13 Goal, key activities, considerations of the maintenance phase.**

Once the new system is in place the work doesn’t stop. The maintenance phase continues until the system is no longer in place. During this phase the system is monitored to ensure that it's working properly and is meeting the goals established during the analysis phase. If any errors or bugs are found, they are fixed in the maintenance phase. In addition, the system may be modified to accommodate new needs that arise. If the new need cannot be met by the original system, the cycle starts over to design a significant modification to the system or to implement a new system. It continues until a new system is in place that meets the needs of its users.

Maintenance Phase Activities:

* Operate equipment.
* Make backups.
* Provide help to users.
* Fix bugs.
* Optimise for speed and security.
* Revise software as necessary to meet business needs.

### **14 Types of modification during the maintenance phase.**

* Major modifications. They include significant functional changes to an existing system, converting to a new system, and introducing new systems or data. They should be implemented following a well-structured process similar to the SDLC.
* Routine modifications. They involve making changes to application or OS software to improve performance, correct problems, or enhance security. They can be simple or complex, but are not ofthe magnitude of major modifications, and can be deployed in the normal course of business.
* Emergency modifications. They are periodically needed to correct software problems or restore processing operations quickly. Although the changes must be completed quickly, they should also be implemented in a well-controlled manner.
* Software patches. They are program modifications involving externally developed software. Their standards should include identifying, evaluating, approving, testing, installing, and documenting changes.

### **15 Quality of service and the metrics being used to measure it.**

Metrics - a set of numbers that give information about a particular process or activity.

1. Throughput is the amount of data processed in a particular time interval.

2. Accuracy is the number of errors occurring in a particular time interval for a particular function.

3. Downtime is the amount of time during which a system isn't available for processing.

4. Capacity is available storage space, number of users, number of connections, or number of packets.

5. User levels is the number of users at peak, average, and low times.

6. Response time is a time period between when a user initiates a request for information and when the request is fulfilled.

### **16 Potential threats to information systems.**

1. Natural disasters can completely shut down a computer system, cut offservice to customers, and potentially destroy the system completely.

2. Power outages can be caused by natural disasters, overloaded power grids, planned brownouts, and rolling blackouts.

3. Equipment failures can occur in any hardware component of a computer system; the risk increases as a hardware component ages, but they can occur in brand-new hardware.

4. Human errors are mistakes made by computer operators. Common ones within an information system include entering inaccurate data and failing to follow required procedures.

5. Software failures can be caused by bugs or flawed software design.

6. Security breaches include stolen data, physical intrusions, and deliberate sabotage.

7. Acts of war can cause physical damage to computer systems; cyberterrorism can also cause damage, using viruses and worms to destroy data and otherwise disrupt computer-based operations, which now include critical national infrastructures such as power grids and telecommunications systems.

8. Malware can damage just about any computer system; you might have experienced the nuisance of rooting out a virus from your personal computer; that inconvenience pales when compared to the potential effect of a virus on a corporate information system.

### **17 Measures to protect data and information systems.**

Information systems security is responsible for the integrity and safety of system resources and activities. Most organisations in developed countries are dependent on the secure operation of their information systems. Information systems are at the heart of intensive care units and air traffic control systems.

Information systems are vulnerable to a number of threats and require strict controls, such as continuing countermeasures and regular audits to ensure that the system remains secure.

Although instances of computer crime and abuse receive extensive media attention, human error is estimated to cause greater losses in information systems operation. Disasters such as earthquakes, floods, and fires are the particular concern of disaster recovery planning, which is a part of a corporate business continuity plan. A contingency scheme is also necessary to cover the failure of servers, telecommunications networks, or software.

### **18 Advantages of electronic government.**

Electronic government (or e-government) is the application of Information and Communication Technologies (ICTs) to government functions and procedures with the purpose of increasing efficiency, transparency and citizen participation.

E-government's advantages

The e-government's ultimate objective is to offer enhanced portfolio of public services in an efficient and cost-effective way to citizens. The e-government also could provide more transparency for the government because it enables the public to be informed about what government is working on and the policies which are enforced.

The primary benefit would be replacing and optimising the paper-based system while implementing electronic government.

The implementation of e-government could also promote better communications between government and business sectors. Hence the benefit of e-government could be creating open and transparent market and a stronger economy. E-government and its capacity could be available to all people regardless of their place or social level.