**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 decision- making, coordination, and control in an organization.

**Goals of Information Systems:**

1. **Collecting Data**: Information systems gather data from various sources, ensuring accurate and relevant information.
2. **Processing Data**: They process and transform raw data into meaningful insights, enabling decision-making.
3. **Storing Information**: Information systems organize and store data efficiently for easy retrieval.
4. **Disseminating Information**: They distribute information to users, whether through reports, dashboards, or real-time updates.

/////////// я не знаю где найти примеры, поэтому просто в chatgpt кинул и вот что он мне дал

1. **Transaction Processing System (TPS)**:
   * **Application Examples**:
     + **Point of Sale (POS) Systems**: Used in retail stores for processing sales transactions, inventory management, and generating receipts.
     + **Online Banking**: Handles fund transfers, balance inquiries, and bill payments.
     + **Airline Reservation Systems**: Manages flight bookings and ticketing.
2. **Management Information System (MIS)**:
   * **Application Examples**:
     + **Sales Reports**: Provides data on sales performance, customer trends, and inventory levels.
     + **Financial Analysis**: Generates financial statements, budget reports, and cost analysis.
     + **Human Resources (HR) Systems**: Tracks employee records, payroll, and benefits.
3. **Decision Support System (DSS)**:
   * **Application Examples**:
     + **Business Intelligence Tools**: Helps analyze historical data, create forecasts, and identify trends.
     + **Healthcare Diagnostics**: Assists doctors in diagnosing diseases based on patient symptoms and medical history.
     + **Investment Portfolio Management**: Provides insights for investment decisions.
4. **Expert Systems**:
   * **Application Examples**:
     + **Medical Diagnosis**: Expert systems can assist doctors by suggesting potential diagnoses based on symptoms.
     + **Legal Advice**: Helps lawyers with legal research and case analysis.
     + **Quality Control in Manufacturing**: Identifies defects and recommends corrective actions.

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

**Transaction Processing System (TPS)**:

* It provides a way to collect, process, store, display, modify, or cancel transactions. Most of these systems allow many transactions to be entered simultaneously.

**Management Information System (MIS)**:

* 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.

**Decision Support System (DSS)**:

* It helps people make decisions by directly manipulating and accessing data from external sources, generating statistical projections, and creating data models of various scenarios.

**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.

**Blockchain technology**

Blockchain is a public ledger that records all Bitcoin transactions, eliminating the need for a third party to process payments. Think of it as a full history of banking transactions. Blocks, or 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. 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. Blockchain is seen as Bitcoin's main technological innovation. Since it provides proof of each transaction, it can review transaction histories to determine how much value a particular address owned at any time.

Each computer that's connected to the Bitcoin network receives a copy of the blockchain upon joining the network. Blockchain.info provides access to the entire Bitcoin blockchain.

**SDLC and its core phases.**

The SDLC has a set of four fundamental phases: planning, analysis, design, and implementation. Different projects might emphasize different parts of the SDLC or approach the SDLC phases in different ways, but all projects have elements of these four phases. Planning, analysis, design, implementation, planning in the system development life cycle, SDLC.

Planning refers to the phase of creating a detailed plan for how the project will be executed, including the schedule budget and resources required.

Analysis, the analysis phase in the system development life cycle, SDLC, is the process of gathering and evaluating information about the requirements of the system being developed to produce a clear understanding of the problem and requirements.

Design in the System Development Lifecycle, SDLC. Design refers to the phase of creating a plan for building the system, including defining the architecture interfaces and data structures. Implementation in the system development life cycle, SDLC, refers to the phase of actually building and developing the software system according to the design specifications created in the previous phases.

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

1. **Goal of the Planning Phase**:
   * The primary objective of the planning phase is to **create a comprehensive Project Development Plan**. This plan serves as a roadmap for the entire project and provides a clear direction for subsequent phases.
   * Before moving beyond the planning phase, the Project Development Plan undergoes review and approval by management.
2. **Main Activities in the Planning Phase**:
   * **Assembling the Project Team**:
     + During this step, the project manager identifies and brings together the necessary team members. These individuals contribute their expertise and skills to the project.
   * **Project Justification**:
     + The planning phase involves assessing the need for the project. This includes:
       - Providing a **short project description**, outlining its scope and purpose.
       - **Justifying the project** by estimating costs and potential financial benefits. This helps stakeholders understand the project’s value.
   * **Choosing a Development Methodology**:
     + The team selects an appropriate development approach (such as Agile, Waterfall, or hybrid methods) based on project requirements, constraints, and organizational context.
   * **Producing a Project Development Plan**:
     + The plan includes details such as:
       - **Scope**: What the project aims to achieve.
       - **Project Costs**: Estimated expenses related to development, implementation, and maintenance.
       - **Potential Benefits**: Expected gains (financial or otherwise) from successful project completion.
       - **Project Team Participants**: Listing team members and their roles.
       - **Project Schedule**: An outline of phases, milestones, and deadlines.

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

**SDLC: Analysis Phase**

Analysis Phase Activities:

✓ Study the current system

✓Determine system requirements

✓ Write a requirements report

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.

System requirements are the criteria for successfully solving problems identified in an information system. These requirements guide the design and implementation for a new or updated information system. They also serve as an evaluation checklist at the end of the development project; because of this, they are sometimes called success factors. A new or updated information system should always meet the requirements defined by the project team.

The project team determines requirements by interviewing users and studying successful information systems that solve problems similar to those in the current system. Another way to determine requirements is to construct a prototype as a trial version of an information system. Often the prototype is not a fully functioning system because it is designed to demonstrate only selected features that might be incorporated into a new information system. A systems analyst shows the prototype to users, who evaluate which features of the prototype are important for the new information system.

After the project team studies the current system and then determines what the new system should do, system requirements are incorporated into a document called a System Requirements Report that describes the objectives for an information system.

**2)**

**Definition of the design phase; its purpose and activities**

Its main **activities** are identifying potential solutions, evaluating them and selecting the best, developing application specifications, obtaining approval to implement the new system. Design phase is about designing, prototyping and making. Its **purpose** of Design Phase is to understand how the new system will fulfil the requirements specified in the system requirements report.

There are 6 phases in SDLC^ planning, analisys, design, coding, testing, implementing.

The design phase can be reffered to as the transformation phase whem am idea is actually transformed into a real working system. Phase 2 comes to an end when once a customer agreed an signed off system. Once this happens the building begins. Data is formed into charts an the design team uses those charts to decide the best way to data be moved and stored. All of the components and security pieces of the system are also determined during the design phase. There is more to the design phase than just drawing up plans. First along with the system there needs to be a book that explains how the system can be installed, its components and system requirements(maintenance manual). User manual explains how to operate and use the new system once it is implemented. Before the system can move on to the 4 phase the customer again need to sign off. This allows essuranse? That the design team met the requirements and is on track to fulfilling the customer needs.

**Hardware and software solutions**

A lot of **hardware** options are available for information systems, project team has to consider the architecture based on device requirements, network technology, cloud hosting and level of automation.

***Device requirements****(to considering about all questions about customer’s hardware related to the developed system)*

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. System analysts have to consider if users sre accesing 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? There are some of the hhardware questions that will be answered in design phase.

***Network technology****(is about the choosing the network types for the system*)

Virtualy every information system requires a network, so the project team must examine different alternatives, such as LANs, extranets, Intranets and the Internet. Manny information systems require a complex mixture of networks, such as 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 addressd during the desing phase. Rather that 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 Amazo, Microsoft or Google

***Level of automation(****how different levels of system automation will affect all aspects of the system*)

The project team should consider the pros and cons of different levels of automation because they affect all aspects of the planned information system. A point-of-sale system, a magnetic strip reader, a pressure-sensitive degitising pad…

Also there are 4 different **software solutions**

**Application development tool** is so called cake mix which contains many of the ingredients necessary for quick and easy baking. It contains system blocks that optimize the process of development. It contains ingradients necessary for quick and easy development of the modules for an information system. It has some customization options, but cannot be modified to exactly meet every system requirement.

**System from scratch** Baking a cake allows you some flexibility in the ingredients you choose-margarine instead of shortening. It requires a lot of time and work to sift the flour, mix all// it is costly, but you devise everything on your own and can choose how to do it. It is significantly long.

**Application software** it is equivalent to buying a pre-made cake that you simply slice and serve. You can get constant updates from a software publisher in the future to meet system requirements better. It need evaluation to determine how well it meets the system requirements.

**Turnkey system**  it is like going out to dinner and simply ordering your choice of cake for dessert. It saves your time, money and resourses. You can almost immediately start using this software.

**Definition of the implementation phase; its purpose and activities**

The next phase is an **Implementation phase**. The main **activities** of this stage are installing hardware and software, creating and testing applications, finishing documentations, testing development tools, etc.

Its **goal** is to make sure that the information system is completely documented so that it can be used effectively and modified easily.

**Testing** is an essential part of the Implementation. There are **4** types of testing: **System Testing….**

**Types of testing**

Testing is an essential part of the Implementation.

*System testing* unsures that new modules work with the rest of the system hardware and software

*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.

*Unit testing* ensures that each module of the new system works correctly

*Integration testing* ensures that all the modules work together correctly

*Business Level testing* is done by multiple business analysts or professional testers to ensure it complies with the requirements.

**Types of conversion**

**-Direct conversion**

It means that the old system is completely deactivated, and the new system is immediately activated. It usually takes place during non-peak hours to minimize disruption to normal business routines. It is risky, however, because if the new system does not work correctly, it might need to be deactivated and undergo further development or testing. In the meantime, the old system must be reentered into the old one.

**+** It is less costly,it is not very time consuming

- It is very difficult to detect small errors in the new system. If the system has not been implemented properly, the new system may fail to work and this will affect the whole organisation

**-Parallel conversion**

It avoids some of the risk of the 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. It often requires that all entries be made in both the new and old systems, which is costly in terms of time, computer resources, and personnel. It offers a good safety net in case a new information system fails to operate reliably or accurately.

+ Risk is reduced. Small minor errors can be easily seen. Companies are able to fix any problems with the new system before ending the previous system

- It is very costly as 2 systems are being operated simultaneously. It is also very time consuming and can be stressful

**-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. In it, however, each module of the new system must work with both the old and new systems, which greatly increases the complexity and cost of application development

+ As the system is tested at every stage, there is very little chance of error

- It takes a lot of time to implement the whole new system to the entire organisation

**-Pilot conversion**

It works well in organisations 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. To prepare for it, system developers must devise methods to integrate information from branches using the new system with information from branches still using the old system.

+ It allows to see whether the new system meets the organization needs in one department/location before using it throughout the entire organization.

* Too much time is involved in testing in one location, there is also increased development and labour costs.

**Scope creep**

**Scope creep** – uncontrolled changes to the scope due to interference from stakeholders or due to misunderstandings from the project manager.

-investigate why it is happening

-change control

-priority matrix

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 are building a product for your own business, such as an app, it is important to stay focused on creating a strong minimum viable product and ship it. You can always add features later on after you get back 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 need, and their wants; know what problem you are solving, and for what user. Prioritise all features in your product according to the needs of your users. It is recommended to use the jab-to-be-done framework to identify the key features that offer the most value to your target audience.

**3) SDLC: Maintenance Phase. System Security** (

1) goal and key activities of the maintenance phase;

considerations that should be taken during the maintenance phase;

2) types of modification during the maintenance phase;

3)quality of service and the metrics being used to measure it;

4)potential threats to information systems;

5)measures to protect data and information systems;

6)advantages of electronic government).

1. The last phase of SDLS is **Maintenance phase**.

There are such **activities** as making modifications and upgrades, fixing bugs and making the system easier to use.

The **goal** of Maintenance phase is to keep product working and upgrade it.

The **main considerations** that should be taking during this phase can be distribute in 3 categories: **efficiency**, **usability**, **appropriateness**.

(

The first is about the **speed** and **quality** of work of the system.

**Usability** can be described with the question “How easy can we use it?”. **Appropriateness** is about the meeting of requirements.)

1. One of the essential parts of Maintenance stage is **modification**, and there are 4 types of them:

* **Major modifications** - that is about significant functional changes to the existing system.
* **Routine modifications** - which correct problems or enhance security.
* **Emergency modifications** as an answer for a crucial problem, that must be made quickly.
* **Software patches** - program modifications involving externally developed software.

1. The level of performance of any information system defines as **quality of service**. It can be measured with the help of metrics, such as **throughput** - the amount of data processed in a particular time interval.

* **accuracy** – the amount of errors occurring in a time interval for a function, **downtime** – the amount of time system isn’t available for processing, **capacity** – available storage space, **number of users**, etc., **user levels** – number of users on at different times, and **response time** – time period between user’s request and its fulfilling.

1. There are a lot of things that can **ruin the information system**. The main threats for it are **natural disasters**, **power outages**, **equipment failures**, **human errors**, **software failures**, **security breaches**, **acts of war and malware**. But the project team always consider about the ways they can prevent or fix the problems with their information system. Usually they use passwords, firewalls, encryption, disaster recovery plans, antiviruses, biometric security, file updates, data backups and hardware inventories.

5)

1. Back up your data

You **should** back up your data regularly. If you’re using an external storage device, keep it somewhere other than your main workplace – encrypt it, and lock it away if possible. That way, if there’s a break-in, fire or flood, you’ll minimise the risk of losing all your data.

2. Use strong passwords and multi-factor authentication

Make sure you use strong passwords on smartphones, laptops, tablets, email accounts and any other devices or accounts where personal information is stored. They **must** be difficult to guess.

3. Be aware of your surroundings

For example, if you’re on a train or in a shared workspace, other people may be able to see your screen. A privacy screen might help you.

4. Be wary of suspicious emails

You and your staff need to know how to spot suspicious emails. Look out for signs such as bad grammar, demands for you to act urgently and requests for payment. New technologies mean that email attacks are becoming more sophisticated. A phishing email could appear to come from a source you recognise.

5. Install anti-virus and malware protection

And keep it up-to-date.

You **must** make sure the [devices you and your employees use at home, or when you’re working away, are secure](https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/security/working-from-home/bring-your-own-device-what-should-we-consider/). Anti-virus software can help protect your device against malware sent through a phishing attack.

6. Protect your device when it’s unattended

Lock your screen when you’re temporarily away from your desk to prevent someone else accessing your computer. If you do need to leave your device for longer, put it in a secure place, out of sight.

7. Make sure your Wi-Fi connection is secure

Using public Wi-Fi, or an insecure connection, could put personal data at risk. You **should** make sure you always use a secure connection when connecting to the internet. If you’re using a public network, consider using a secure Virtual Private Network (VPN).

8. Limit access to those who need it

Different workers may need to use different types of information. Put access controls in place to make sure people can only see the information they need. For example, payroll or HR may need to see workers’ personal information, but your sales staff won’t.

9. Take care when sharing your screen

Sharing your screen in a virtual meeting may show your device to others exactly as you see it, including any open tabs or documents. Before sharing your screen, you **should** close anything you don’t need and make sure your notifications and pop-up alerts are switched off.

10. Don’t keep data for longer than you need it

Getting rid of data you no longer need will free up storage space. This also means you have less personal information at risk if you suffer a cyber-attack or personal data breach.

11. Dispose of old IT equipment and records securely

You **must** make sure no personal data is left on computers, laptops, smartphones or any other devices, before you dispose of them. You **could** consider using deletion software, or hire a specialist to wipe the data.

6)

## Advantages of E-Government

**Improved Efficiency**: One of the main advantages of e-government is the potential to improve the efficiency of the current paper-based system. By digitizing government services and information, e-government can streamline administrative processes, reduce paperwork, and save time and money.

**Better Communication**: E-government also facilitates better communication between governments and businesses, creating a more open market and a stronger economy. For example, e-procurement allows smaller businesses to compete for government contracts, while larger businesses can access information and services more easily.

**Accessibility**: As society becomes more mobile, e-government services can be accessed by citizens from anywhere in the country, at any time of the day. This increases the accessibility of public services and improves the overall customer experience.

**Transparenc**y: E-government can improve government transparency by allowing the public to be informed about what the government is working on and the policies they are trying to implement. This creates a more informed and engaged citizenry, which can lead to more accountability and better decision-making.

## Disadvantages of E-Government

**Lack of Equality in Public Access**: One of the main disadvantages of e-government is the lack of equality in public access to the internet. While many people have access to the internet, there are still many who do not, particularly in developing countries. This can create a digital divide, where some citizens are unable to access government services or information online.

**Reliability of Information**: The reliability of information on the web is also a concern. Citizens may not be able to discern between accurate and inaccurate information, which could lead to misinformation and biased public opinions.

**Hidden Agendas**: There is also the concern that government groups may have hidden agendas that could influence and bias public opinions. E-government systems must be designed to prevent this from happening and promote transparency and accountability.

**Impacts on Economic, Social, and Political Factors**: The implementation and design of e-government can have potential implications for economic, social, and political factors. E-government can lead to the disintermediation of the government and citizens, which can impact power dynamics and potentially lead to social unrest.

**Vulnerability to Cyber Attacks**: E-government systems are vulnerable to cyber attacks, which can compromise sensitive information and undermine public trust in the government. E-government systems must be designed with security in mind to prevent these types of attacks.

**Cost**: Although a large amount of money is spent on the development and implementation of e-government, the outcomes and effects of trial internet-based governments are often difficult to gauge or unsatisfactory. Technology keeps changing, and if the technology becomes obsolete, it can prohibit the effectiveness of e-government. The adoption of any technology platform needs to be assessed carefully and balanced not based on what is needed now, but also what the future requires.

**Inaccessibility**: E-government sites that provide web-based access and support often do not offer the potential to reach many users, including those who live in remote areas, have low literacy levels, or exist on poverty line incomes. Some sort of hybrid system may be required to co-exist as the e-government journey transitions.