

Semester-2

Created by Sudhanshu sharma

Unit-1

System Concept

Definition-

- The term system may be defined as an orderly arrangement of a set of interrelated and interdependent element that operate collectively to accomplish some common purpose or goal.
- For example – human body is a system, consisting of various parts such as head, heart, hands, legs and so on.

The various body parts are related by mean of connecting networks of blood vessels and nerves and the system has a main goal of “living”. Thus, a system can be described by specifying its parts, the way in which they are related, and goals which they are expected to achieve.

- A business is also a system where economic resources such as people, money, material, machines, etc are transformed by various organizational processes (such as production, marketing, finance etc.)

Characteristics-

A component

- an irreducible part or aggregation of parts that make up a system, also called a subsystem.

Interrelated components

- Dependence of one subsystem on one or more subsystems.

Boundary

- The line that marks the inside and outside of a system and that sets off the system from its environment.

Purpose

- The overall goal or function of a system.

Environment

- Everything external to a system that interacts with the system.

Interface

- Point of contact where a system meets its environment or where subsystems meet each other.

Constraint

- A limit to what a system can accomplish

Input

- Whatever a system takes from its environment in order to fulfill its purpose

Output

- Whatever a system returns from its environment in order to fulfill its purpose

Elements of System-

A system has three basic elements input, processing and output. The other elements include control, feedback, boundaries, environment and interfaces

Input: Input is what data the system receives to produce a certain output.

Output: What goes out from the system after being processed is known as Output.

Processing: The process involved to transform input into output is known as Processing.

Control: In order to get the desired results it is essential to monitor and control the input, Processing and the output of the system. This job is done by the control.

Feedback: The Output is checked with the desired standards of the output set and the necessary steps are taken for achieving the output as per the standards, this process is called as Feedback. It helps to achieve a much better control in the system.

Boundaries: The boundaries are nothing but the limit of the system. Setting up boundaries helps for better concentration of the activities carried in the system.

Environment: The things outside the boundary of the system are known as environment. Change in the environment affects the working of the system.

Interfaces: The interconnections and the interactions between the sub-systems is known as the Interfaces. They may be inputs and outputs of the systems.

Physical And Abstract System-

Physical– These are tangible entities that may be static or dynamic in operation. For example- parts of a computer center are the desks, chairs etc. that facilitate operation of the computer. They are static and a programmed computer is dynamic.

Abstract System – These are conceptual or non physical entities. For example- the abstract conceptualization of physical situations. A model is a representation of a real or planned system. A model is used to visualize relationships.

Open And Closed System-

Open system

A system that interacts freely with its environment, taking input and returning output

For example- The education system or any business process system will quickly change when the environment changes. To do this, an open system will interact with elements that exist and influence from outside the boundary of the system.

Closed system

A system that is cut off from its environment and does not interact with it

For example- Consider a 'throw-away' type sealed digital watch, which is a system, composed of a number of components that work in a cooperative fashion designed to

specific task. This watch is a closed system as it is completely isolated from its environment for its operation. Such closed system will finally run down or become disorganized. This movement to disorder is termed on increase in entropy.

Man Made Information System-

- Information for a particular use. These information systems will be made up of hardware, software, technology and people.
- A common misconception revolved around information systems is that they are made up entirely of computers and technology. However - people or staff are equally as important to the system if it wants to operate correctly and efficiently.
- A good example of this would be something that is known as a Management Information System or MIS for short. An MIS is a collection of people, processes and resources that are used together in order to help managers and senior members of staff to make effective decisions.
- To give you an example in context, you could consider a school. The MIS system of this school will operate to give the head teacher and members of the school council the information they need to make effective decisions.

System Development Life Cycle-

- System Development Life Cycle (SDLC) is a conceptual model which includes policies and procedures for developing or altering systems throughout their life cycles.
- SDLC is used by analysts to develop an information system. SDLC includes the following activities –

Requirements
Design
Implementation
Testing
Deployment
Operations
Maintenance

Various Phase of System Development-

- Systems Development Life Cycle is a systematic approach which explicitly breaks down the work into phases that are required to implement either new or modified Information System.



1- System Planning

The Planning phase is the most crucial step in creating a successful system, during this phase you decide exactly what you want to do and the problems you're trying to solve, by:

- Defining the problems, the objectives and the resources
- Studying the ability of proposing alternative solutions after meeting with clients, suppliers, consultants and employees. 🏢 Studying how to make your product better than your competitors'.

2- System Analysis

- Gather, analyze, and validate the information.
- Define the requirements and prototypes for new system.
- Evaluate the alternatives and prioritize the requirements
- Examine the information needs of end-user and enhances the system goal.

3- System Design

- Includes the design of application, network, databases, user interfaces, and system interfaces.

- Transform the SRS document into logical structure, which contains detailed and complete set of specifications that can be implemented in a programming language.
- Create a contingency, training, maintenance, and operation plan.

4- Implementation

- Implement the design into source code through coding.
- Combine all the modules together into training environment that detects errors and defects.
- A test report which contains errors is prepared through test plan that includes test related tasks such as test case generation, testing criteria, and resource allocation for testing.

5- System Testing and Integration

- Bringing different components and subsystems together to create the whole integrated system, and then introducing the system to different inputs to obtain and analyze its outputs and behavior and the way it functions. Testing is becoming more and more important to ensure customer's satisfaction, and it requires no knowledge in coding, hardware configuration or design.

6- System Maintenance

- In this phase, periodic maintenance for the system will be carried out to make sure that the system won't become obsolete, this will include replacing the old hardware and continuously evaluating system's performance, it also includes providing latest updates for certain components to make sure it meets the right standards and the latest technologies to face current security threats.

System Planning

Base For Planning A System-

Dimention of Planning-

- Long-term planning is something of a rarity amongst event organizers, and is therefore one of the key areas where our clients sees the most significant improvements upon using our services. Strategic planning stems from the vision, objectives, philosophy and policy formulation of the firm and extends its influence over longer time periods. Implementing a strategy entails making changes to current operations with future goals in mind.

Unit-2

Initial Investigation

- The initial investigation is the first step in the analysis phase of your project. It is a fact-finding mission in which you aim to find out as much as you can about your user, the current problem and what the user needs from a computer system in order to solve the problem. You will use a variety of methods of fact-finding in order to give you as full a picture as possible.
- What you find out from your investigation will form the basis of the rest of the analysis phase and the design phase and it is therefore essential that it is thorough and well-planned. It is extremely difficult to create an appropriate and useful computer system and to write a quality project report without first carrying out a genuine, well-planned and comprehensive initial investigation with a real user or users.

Determining Users Requirements And Analysis

Requirements analysis involves frequent communication with system users to determine specific feature expectations, resolution of conflict or ambiguity in requirements as demanded by the various users or groups of users, avoidance of feature creep and documentation of all aspects of the project development process from start to finish. Energy should be directed towards ensuring that the final system or product conforms to client needs rather than attempting to mold user expectations to fit the requirements.

Requirements analysis is a team effort that demands a combination of hardware, software and human factors engineering expertise as well as skills in dealing with people.

Fact Finding Process And Techniques-

Fact finding is process of collection of data and information based on techniques which contain sampling of existing documents, research, observation, questionnaires, interviews, prototyping and joint requirements planning. System analyst uses suitable fact-finding techniques to develop and implement the current existing system. Collecting required facts are very important to apply tools in System

Development Life Cycle because tools cannot be used efficiently and effectively without proper extracting from facts. Fact-finding techniques are used in the early stage of System Development Life Cycle including system analysis phase, design and post implementation review. Facts included in any information system can be tested based on three steps: data- facts used to create useful information, process- functions to perform the objectives and interface designs to interact with users.

- Fact-finding techniques
- There are seven common fact-finding techniques
- Sampling of existing documentation, forms and databases
- Research and Site visits
- Observation of the work environment
- Questionnaires
- Interviews
- Prototyping
- Joint requirements planning

Feasibility Study

- A feasibility study is research, testing and experimentation designed to determine if a strategy, design, product or process is possible and practical.

Determination Of Feasibility Study-

- Feasibility is defined as the practical extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software. Information such as resource availability, cost estimation for software development, benefits of the software to the organization after it is developed and cost to be incurred on its maintenance are considered during the feasibility study.

Technical-

- Technical feasibility study is the complete study of the project in terms of input, processes, output, fields, programs and procedures. It is a very effective tool for long term planning and trouble shooting. The technical feasibility study should most essentially support the financial information of an organization.

Operational & Economic Feasibilites-

- The purpose of an economic feasibility study (EFS) is to demonstrate the net benefit of a proposed project for accepting or disbursing electronic funds/benefits, taking into consideration the benefits and costs to the agency, other state agencies, and the general public as a whole. ... Cost Benefit Analysis.

System Performance Constraints-

- A constraint, in project management, is any restriction that defines a project's limitations; the scope, for example, is the limit of what the project is expected to accomplish. ... A project's scope involves the specific goals, deliverables and tasks that define the boundaries of the project.
- Check the performance of any system is known as system performance.

Determination Of Feasibility Study-

- Feasibility is defined as the practical extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software. Information such as resource availability, cost estimation for software development, benefits of the software to the organization after it is developed and cost to be incurred on its maintenance are considered during the feasibility study. The objective of the feasibility study is to establish the reasons for developing the software that is acceptable to users, adaptable to change and conformable to established standards. Various other objectives of feasibility study are listed below.

Identification Of System Objectives-

- Obtaining systematic information from experimental observations is a key aspect of any scientific work. The obtained information leads to the formulation of a model of the system under consideration. Such a model is some form of pattern that explains the observed experimental results and allows for predictions of future system responses to be made.

In our research in the field of system identification we address the problem of deriving mathematical models to describe dynamical systems. In particular, we attempt to derive tools and methods to construct dynamic models for control purposes.

Feasibility Report-

Feasibility report

- A feasibility report is the results of a feasibility study. This report details whether or not a project should be undertaken and the reasons for that decision.
- Report Content
 1. Introduction/Executive Summary
 2. Background
 3. outline of project
 4. Methodology/method of analysis
 5. Overview of alternatives
 6. Conclusion
 7. Recommendation

For More Info Visit

Cost/Benefits Analysis

- Cost–benefit analysis (CBA), sometimes called benefit costs analysis (BCA), is a systematic approach to estimate the strengths and weaknesses of alternatives (for example in transactions, activities, functional business requirements or projects investments); it is used to determine options that provide the best

Data Analysis-

- Data analysis is a primary component of data mining and Business Intelligence (BI) and is key to gaining the insight that drives business decisions. Organizations and enterprises analyze data from a multitude of sources using Big Data management solutions and customer experience management solutions that utilize data analysis to transform data into actionable insights.

Cost And Benefit Analysis Of A New System-

- Cost–benefit analysis (CBA), sometimes called benefit costs analysis (BCA), is a systematic approach to estimate the strengths and weaknesses of alternatives (for example in transactions, activities, functional business requirements or projects investments); it is used to determine options that provide the best

Categories Determination Of System Proposal-

The System Proposal

proposal

- Combines all material created in planning & analysis
- Included sections:
 - Executive summary
 - Provides all critical information in summary form
 - Helps busy executives determine which sections they need to read in more detail
 - The system request
 - The workplan
 - The feasibility analysis
 - The requirements definition
 - Current models of the system (expected to evolve)

Unit-3

Tools Of Structured Analysis

Logical And Physical Models

Logical Data Model-

- The logical data model is an evolution of the conceptual data model towards a data management technology such as relational databases. Actual implementation of the conceptual model is called a logical data model. To implement one conceptual data model may require multiple logical data models. Data modeling defines the relationships between data elements and structures

Physical Data Model-

- Physical data model is a representation of a data design which takes into account the facilities and constraints of a given database management system. Physical data model represents how the model will be built in the database. A physical database model shows all table structures, including column name, column data type, column constraints, primary key, foreign key, and relationships between tables.

Context Diagram-

- Also known as data flow diagram.
- A context diagram is a top level (also known as "Level 0") data flow diagram. It only contains one process node ("Process 0") that generalizes the function of the entire system in relationship to external entities.

Data Dictionary-

- Data dictionary is a place where store the structure of the data.

Data Diagram-

- To moving the data from one place to another place is represented by picture is called data diagram or data flow diagram.
- Data flow diagrams are used to graphically represent the flow of data in a business information system. DFD describes the processes that are involved in a system to transfer data from the input to the file storage and reports generation.

Process-

- A process receives input data and produces output with a different content or form.

Form Driven Methodology-

- Both forms and reports are the product of input and output design and are business document consisting of specified data. The main difference is that forms provide fields for data input but reports are purely used for reading.

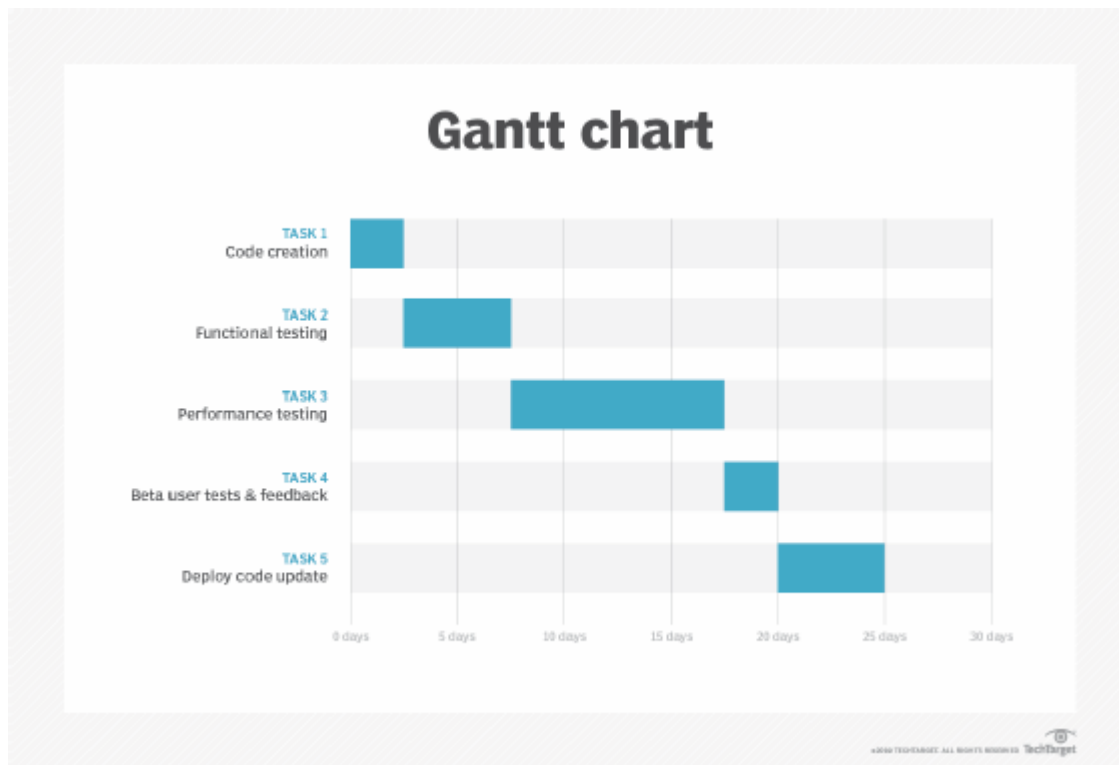
IPO And HIPO Charts-

- IPO Chart and HIPO Charts are used to distinguish the system's detail level information, which is described in a flowchart. IPO Chart is a useful technique to analyze the information requirements. HIPO Chart provides additional processing details.

Gantt Charts-

- A Gantt chart is constructed with a horizontal axis

representing the total time span of the project, broken down into increments (for example, days, weeks, or months) and a vertical axis representing the tasks that make up the project (for example, if the project is outfitting your computer with new software, the major tasks involved might be: conduct research, choose software, install software). Horizontal bars of varying lengths represent the sequences, timing, and time span for each task.



System Model-

- Basic Approach

System modeling

- System modeling is the process of developing abstract models of a system, with each model presenting a different view or perspective of that system.
- System modeling has now come to mean representing a system using some kind of graphical notation, which is now almost always based on notations in the Unified Modeling Language (UML).
- System modelling helps the analyst to understand the functionality of the system and models are used to communicate with customers.






to

Pseudo Codes-

- Pseudocode (pronounced SOO-doh-kohd) is a detailed yet readable description of what a computer program or algorithm must do, expressed in a formally-styled natural language rather than in a programming language. Pseudocode is sometimes used as a detailed step in the process of developing a program.

Flow Charts-System flow chart-

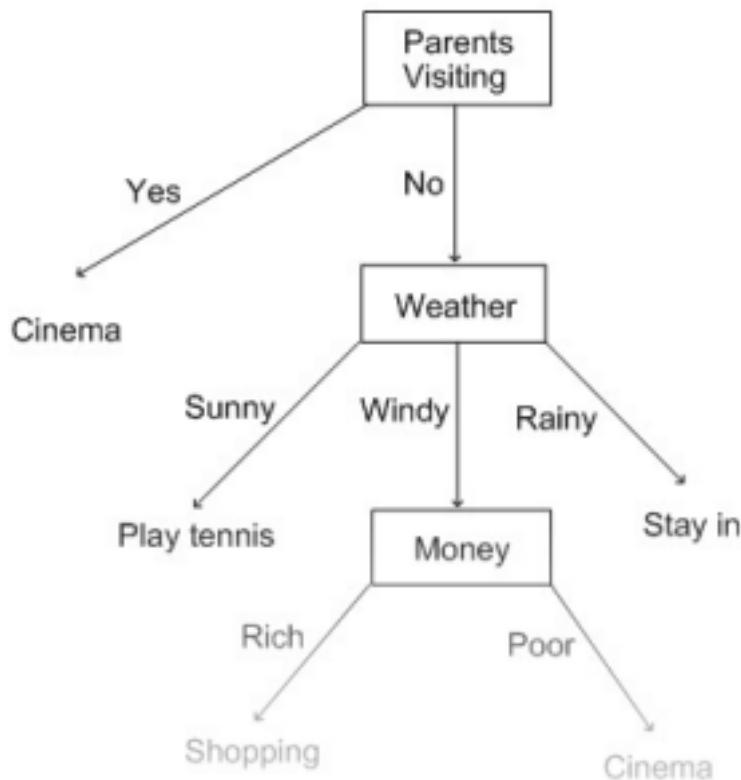
- The use of a flow chart to represent the pictorial form for execution of the program
- There are various are

Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision

Decision Tree-

- Making a decision with the help of Graphical representation.
- A decision tree is a graph that uses a branching method to illustrate every possible outcome of a decision. Decision trees can be drawn by hand or created with a graphics program or specialized software.
- A decision tree is a graphical representation of possible solutions to a decision based on certain conditions. It's called a decision tree because it starts with a single box (or root), which then branches off into a number of solutions, just like a tree.
- Decision trees are helpful, not only because they are graphics that help you 'see' what you are thinking, but also because making a decision tree requires a systematic, documented thought process. Often, the biggest limitation of our decision making is that we can only select from the known alternatives.

Decision trees help formalize the brainstorming process so we can identify more potential solutions.



Data Validation-

- To accept the data at the basis of condition.
- Data validation is a process that ensures the delivery of clean and clear data to the programs, applications and services using it. It checks for the integrity and validity of data that is being inputted to different software and its components. Data validation ensures that the data complies with the requirements and quality benchmarks.
- Data validation is also known as input validation.

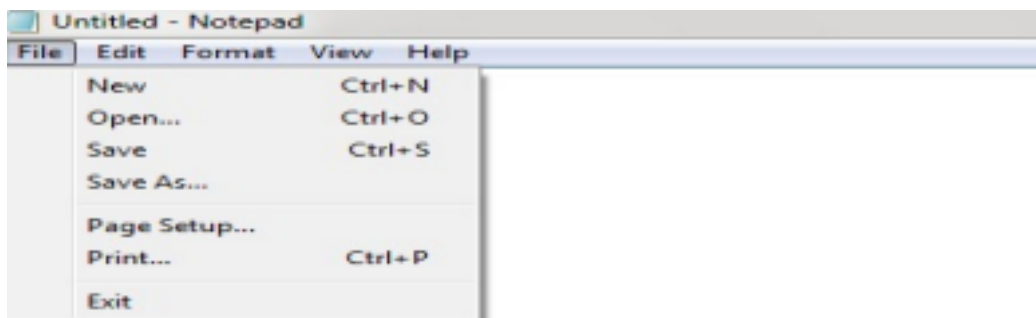
Form Design

Input And Output Form Design Methodologies-

- Input Design. In an information system, input is the raw data that is processed to produce output. During the input design, the developers must consider the input devices such as PC, MICR, OMR, etc. It should serve specific purpose effectively such as storing, recording, and retrieving the information.

Menu-

- The use of the menu is for collect the commands in drop down approach.
- **For Example-**



Screen Design-

- User interface is the front-end application view to which user interacts in order to use the software. User can manipulate and control the software as well as hardware by means of user interface. Today, user interface is found at almost every place where digital technology exists, right from computers, mobile phones, cars, music players, airplanes, ships etc.
- User interface is part of software and is designed such a way that it is expected to provide the user insight of the software. UI provides fundamental platform for human-computer interaction.

Layout Consideration-

- Arrange the components on the screen s called Layout.
- When planning a layout it is important to consider the space around each item which is needed as 'Standing space'. For example when drying after a bath or shower, washing at the basin or using the WC all these areas have to be taken into consideration to ensure that each space is adequate to create a comfortable

Unit-4

Management Standard

- The System Management Standards provide practical guidance for organizations to establish strategic IT plans based on management strategies, to design and implement appropriate control to improve the effectiveness of IT investment, and to reduce the risks based on the IT strategic plan over the system life cycle from

System Analysis Standards-

- SSADM follows the waterfall life cycle model starting from the feasibility study to the physical design stage of development. One of the main features of SSADM is the intensive user involvement in the requirements analysis stage. The users are made to sign off each stage as they are completed assuring that requirements are met. The users are provided with clear, easily understandable documentation consisting of various diagrammatic representations of the system. SSADM breaks up a development project into stages, modules, steps and tasks. The first and foremost model developed in SSADM is the data model. It is a part of requirements gathering and consists of well defined stages, steps and products. The techniques used in SSADM are logical data modeling, data flow modeling and entity behavior modeling.

Programming Standard-

- Standards in computer programming are methods of programming that have been declared

thereafter are recommended as the approach that should be used. ... Closely tied with programming standards, best practices are simply recommended methods of writing code.

Operating Standard-

- The systems approval is a way of thinking about the analysis and design of computer based applications. It provides a framework for visualizing the organizational and environmental factors that operate on a system. When a computer is introduced into an organization, various functions' and dysfunction's operate on the user

Documentations Standards-

- Documentation process standards These standards define the process that should be followed for document production. Document standards These standards govern the structure and presentation of documents. Document interchange standards These standards ensure that all electronic copies of documents are compatible.

User Manual-

- user's manual and the help system and as one is devising test cases, particularly if it is important to deliver a ... abstraction that survives the analysis should be explained in terms of. 1. what the Fainchtein's participation in the entire requirements analysis and system design, including construction of the.

System Development Manual-

- System Analysis and Design Quick Guide - Learn System Analysis and Design in simple and easy steps starting from basic to advanced concepts with examples ... It helps in documenting current operations within short span of time as the procedure manuals and forms describe the format and functions of present system.

Programming Manual-

- Before coding, there should be a understanding on pseudo, algorithm and the high level language(C, C++, C#, Java, etc.) you want to make use of. This will aid you to designing a system for a specific purpose. Modern programming usually requires an object oriented approach to software development. Object oriented development attempts to use the classifications, relationships, and properties of objects to aid in program development. The object can be any item or concept. The objects contain both attributes and operations that interact to meet a specific need. Attributes are properties that relate to the object and operations are methods or actions that the object can perform to modify itself or data. Access to the data within an object is available only via the objects operation also known as the interface to the object.

Programming Specifications-

- In computer science, a program specification is the definition of what a computer program is expected to do. It can be informal, in which case it can be considered as a blueprint or user manual from a developer point of view, or

case it has a definite meaning defined in mathematical or programmatic terms. In practice, most successful specifications are written to understand and fine-tune applications that were already well-developed, although safety-critical software systems are often carefully specified prior to application development. Specifications are most important for external interfaces that must remain stable.

Operator Manual-

- Systems operators must be trained properly such that they can handle all possible operations, both routine and extraordinary. The operators should be trained in what common malfunctions may occur, how to recognize them, and what steps to take when they come.
- Training involves creating troubleshooting lists to identify possible problems and remedies for them, as well as the names and telephone numbers of individuals to contact when unexpected or unusual problems

System Testing And

Quality System testing and Quality Assurance

Testing-

- Testing is the process or activity that checks the functionality and correctness of software according to specified user requirements in order to improve the quality and reliability of system. It is an expensive, time consuming, and critical approach in system development which requires proper planning of overall testing process.

Quality Assurance-

- It is the review of system or software products and its documentation for assurance that system meets the requirements and specifications.
- Purpose of QA is to provide confidence to the customers by constant delivery of product according to specification. 🎬
Software quality Assurance (SQA) is a techniques that includes procedures and tools applied by the software professionals to ensure that software meet the specified standard for its intended use and performance.

Steps in System Implementations

and Software Maitenance-

- Software maintenance is a part of Software Development Life Cycle. Its main purpose is to modify and update software application after delivery to correct faults and to improve performance. Software is a model of the real.

Unit-5

Organization of EDP

Introduction-

- Elements of Electronic Data Processing. A well-designed and implemented EDP system in a data processing company will generally be composed of four basic elements: ... Software: Spreadsheets, custom applications, databases, and other pieces of code used to manage and collect the data.

Job Responsibility & Duties of EDP-

- EDP stands for electronic data processing systems, and an EDP specialist has direct supervision of large-scale computer systems and related equipment. The job duties include administering routine computer support tasks and doing special projects as assigned.

Personal's-EDP Manager-

- The Role of an EDP Manager in an Organisation
- With the government's emphasis on Digital India, IT industry has been observing a boom for past few years. But a job in IT doesn't always mean you need to be developer or a programmer. There are many lucrative opportunities which can give you a promising career ahead. One such prospect happens to be a career in EDP.

- EDP or Electronic Data Processing (EDP) managers are usually hired by companies that rely on computers for their operations. With more and more firms using computers, the need of Electronic Data Processing (EDP) managers has also increased.
- From banks to educational establishments, almost all companies have EDP department nowadays. Before knowing more about EDP manager jobs; let's have a look on what does an EDP department actually do.

System Analyst-

- A system analyst is a person responsible for the development of software and hardware solution to the efficient working of the organization. Analysts study the environment and problems of an organization to determine whether a new information method can provide solution to the problem.
- The main job of system analyst is to provide right type of information, in right quantity at the right time in post effective manner to the management or the end user.

Programmers-

- Applications systems analysts/programmers are in charge of analyzing and developing programming logic for software packages in their organization. They are responsible for coding specific requirements based on company objectives.

Operators-

- Operoter are those who can perform some operation like arithmetic, logical and some other

Essential Features in EDP Organization-

- Economic Ignition-The most essential feature of an EDP organization is its objective to activate the local economy and attract, retain and expand profitable business activity. ...
- Community Collaboration. All EDPs work on a principle of cooperative effort. ...
- Economic Research and Analysis. ...
- Strategic Planning.

Selection of Data Processing Resources:

1)Purchase

2)Lease

3)Rent(Advantages & Disadvantages)

Hardware and Software

Procurement-In House Purchase v/s Hiring and Lease-

- Historically, federal IT offices had two models for acquiring software or hardware: the Ownership Model and the Leasing Model. Agencies that procure their own assets and directly manage the associated services with their own resources follow the Ownership Model. This model is ideal for risk-averse agencies that want to self-manage services, control all assets, and can accept long technical refresh cycles. Most federal agencies still employ this model for the majority of their

services, such as (but not limited to) email, end user computing (PCs), hosting, and help desk.

- The Leasing Model is similar to the Ownership Model in that the management of the service is performed by the agency, and is ideal for agencies that want to self-manage their services. In contrast to the Ownership Model, though, the equipment in the Leasing Model is leased to the federal government from a third party vendor for a limited period of time. This model is thus better suited for agencies that need to replace their equipment faster and want consistent year-over-year budget consistency.