CHAPTER 2

INTRODUCTION TO SYSTEM DEVELOPMENT

2.1 INTRODUCTION

New computer systems are implemented to replace existing manual systems, often to address specific challenges identified by the organization. Over time, these systems may also be upgraded or replaced by newer systems as solutions to emerging needs. Such challenges may arise if management and employees recognize that the organization is underperforming, or if there's a need to seize new opportunities to enhance success.

The process of developing a new system aimed at improving the previous one is known as the ***system life cycle***. This cycle comprises several key stages: system analysis, system design, programming, testing, conversion, and production and maintenance. This chapter provides a comprehensive overview of system development, focusing on various methods, including the system life cycle, which will be examined in detail.

2.2 SYSTEM ANALYSIS AND DESIGN

Before purchasing and installing a computer system, the organization must first identify the application areas it intends to support, such as word processing, accounting, or budgeting. Additionally, it's important to assess the specific needs of end users to select suitable application packages for each area.

This approach can work well for smaller businesses that require basic computer-assisted support for routine tasks. However, it may not be adequate for developing more complex systems, especially in large organizations where substantial data processing is needed.

Large organizations are more likely to develop their own systems or hire specialists to design custom information systems. Information specialists assess the organization's requirements and design a system that meets these needs. Key activities in system analysis and design include hardware acquisition and installation, program development, system testing, and making necessary adjustments. Staff training is also organized to ensure smooth system adoption.

Once the system is operational, ongoing maintenance is essential, requiring experts in various areas to ensure its continued performance and adaptability.

2.3 GENERAL OVERVIEW OF SYSTEM DEVELOPMENT

The term system development refers to all the series of activities that go into producing an information system as a solution to the challenge or problem facing the organization. These activities are:

(1). Systems Analysis

The term system analysis is a problem-solving technique that decomposes a system into its component pieces for the purpose of studying how well those component parts work and interact to accomplish their purpose. (Definition Courtesy of Whitten, J. L. et al 2001)

The stage describes the early phase of system development which consists of the definition of the problem, identifying the cause, specifying the solution and recognizing the information requirement that must be met by the system solution.

Some other activities involved in this phase are

- ***Feasibility study***: Systems analysis also involves a feasibility study which is to determine whether the solution is feasible or achievable given the organization resources and other constraints.
- ***Information Requirement***: This is the most difficult aspect of the system analysis which defines the specific information requirement that must be met by the system solution selected. In most level the basic information requirements of a new system involves identifying who needs what information where, when and how. Requirement analysis also states the objectives of a new or improved system, economic, technical and time constraints, as well as the organization goals, procedures, and decision processes.

(2). System Design

This is also referred to as *systems synthesis* and is a complementary problem -solving technique to system analysis that reassembles system's component pieces into a complete system which is hoped to be an enhanced system. Systems design details how a system will meet the information requirements as determined by the systems analysis. This may involve adding, deleting and changing component pieces relative to the original system.

The design of an information system can be sub-divided into logical and physical design specification.

- ***Logical Design***: This spells out the component parts of the system and their relationship to one another as they would appear to users. Logical design also describes the control input, outputs and processing actions to be performed and controls that the system solution will do logically and not the physical implementation.
- **Physical Design**: This is the process of transforming the abstract logical design into the required technical design as the new system. Physical design also provides the specifications for hardware, software, manual procedure and transformation of the abstract logical design into a functioning system.

(3). Programming

At this stage the design specifications that were prepared during the design stage are now translated into program code required by the machine.

(4). Testing

Testing provides the answer to the problem "*will the system produce the desired result under known conditions*"? Comprehensive testing must be carried out on the designed system to ascertain whether it produces the right results. Testing is a time-consuming exercise, and costly because as

much as fifty percent of the entire development budget may be spent at this stage. Testing has to be carefully prepared, result reviewed and correction made where 13

necessary. In some cases, part of the system may have to be redesigned. Testing an information system can be grouped into three activities.

- ***Unit Testing***: This is also referred to as program testing. It is the process of testing, each unit or program that makes up a system separately. The purpose of this testing is to guarantee that programs are error free, but this may be practically difficult to achieve.
- ***System Testing***: It involves testing the functioning information system as a whole whether the units or modules will function together as planned. Some examined areas include performance time, capacity for file storage, recovery and restart capabilities.
- ***Acceptance Testing***: This test provides final clearance or certification that the system can commence operation in a production setting. Systems tests are evaluated by end-users and reviewed by the management. When all parties are satisfied with the new system that it conforms to their specifications and standards, it is then formally accepted for installation.

(5). Conversion

This is the process of changing from the older existing system to the newly developed system. Conversion provides an answer to the question. "*Will the new system work under real conditions?*" There are four major conversion strategies that can be used.

- ***Parallel Strategy***: This strategy involves bringing both the old system and its potential replacement to run together for some time until everyone is assured that the new system is functioning correctly. This mode of conversion is the safest approach because in case there is any error or processing disruption with the new system, one can easily reverses back to the old system. Although, the strategy is very expensive since additional staff or resources may be needed for the entire system.
- ***Direct Cutover Strategy***: This is a very risky conversion method where the new system completely replaces the old one. There will be no other system to fall back if there is any problem with the new system.
- ***Pilot Study Strategy***: In this method of conversion, new system is introduced to a limited area in the organization until it is proved to be functional.
- ***Phased Approach Strategy***: This introduces the new system in stages, either by function or by organizational units. For example, if it is by function, a newly introduced payroll system may start with casual or hourly workers that are paid daily, later those paid weekly, followed by those paid monthly. If the system is introduced by organizational unit, the head office might be converted first, followed by regional office and later their branches.

(6). Production and Maintenance

After installing a new system and completing the conversion, the ***production phase*** begins. During this stage, end-users and technical specialists review the system's performance against its original goals. Adjustments to hardware, software, documentation, or procedures to fix issues, meet new requirements, or enhance efficiency are referred to as ***maintenance.***

REVIEW QUESTIONS ON CHAPTER ONE

1. (a) Define the term system

   (b) State four characteristics of a system.

   (c) Differentiate between a system environment and system boundary

2. Briefly explain the following elements of system:

   (a) Input (b) Process (c) Output

3. (a) What do you understand by a system

   (b) Write short notes on the following system classification

   (i) Adaptive System (ii) Probabilistic System (iii) Deterministic System

4. Distinguish between the following pairs of systems:

   (a). Closed or Open (b). Formal or Informal (c). Physical or Abstract (d). Manual or Automated

5. Briefly explain the following terms:

   (a) System planning (b) System control (c) System coordination

REVIEW QUESTIONS ON CHAPTER TWO

1. What is the purpose of implementing new computer systems to replace existing manual systems?

2. Describe the key stages of the system life cycle and their significance in system development.

3. Explain the difference between logical design and physical design in the system design phase.

4. What are the three types of testing conducted in the testing phase, and what is the primary purpose of each?

5. Outline the four major conversion strategies in system development and provide one advantage and disadvantage of each.

CHAPTER 3

ROLES OF INFORMATION SYSTEMS IN SYSTEMS DEVELOPMENT

3.1 INTRODUCTION

This chapter describes the fundamental concept of information system and takes a look at its benefits and limitations. Also to be discussed are the roles and classification of information systems.

3.2 DEFINITION OF AN INFORMATION SYSTEM

Information system is defined as the total apparatus or set of interrelated components that collects, process, store and distribute information within the organization for coordination and decision making.

Information system can also be described as an arrangement of people, data, processes and interfaces that are collectively involved in daily business operations. Information system contains information about significant people, places and things within the organization or its environment.

It can also defined as a combination of hardware, software, infrastructure and trained personnel organized to facilitate planning, control, coordination, and decision making in an organization.

Information system can be grouped as either as **formal** or **informal** information systems. Informal information system works on unstated rules of behavior. There is no rule on what is information or on how it will be stored or processed. An example is office gossip. Formal information system operates in accordance with predefined rules that are relatively fixed.

Also, formal information systems can be either computer-based or manual. Manual based system makes use of paper and pen. Computer based information system in contrast, rely on the use of a computer system to process and distribute information. Our interest in this book is the formal organizational computer-based information system (CBIS)

Benefits of Information Systems

(i). Information system can process data faster than people, since its operation is automatic.

(ii). Through information system the internet can distribute immediately to millions of people across the globe.

(iii). It has made possible new advances in surgery, radiology and patient monitoring.

(iv). It provides new efficiencies through services such as automated teller machines (ATMs), telephone systems or computer controlled airplanes and terminals, and checking of result online.

Limitation of Information Systems

(i). Activities that were previously carried out manually are now replaced with information systems this may eliminate job.

(ii). The use information system may allow the organization to collect the details of the people that may violate their privacies.

(iii). Breakdown of system can cause shutdowns of businesses.

(iv). Heavy users of information systems may suffer repetitive stress injury (RSI), techno stress and other related health hazard.

(v). Illegal copies of software, books, articles and intellectual property are disseminated.

3.3 THE ROLE OF INFORMATION SYSTEM IN AN ORGANIZATION

Information system provides the management, managers and the stakeholders with tools for more precise planning, forecasting, monitoring and controlling of business. More so, the use of powerful computers, software and networks information systems have helped organizations to become flexible, removing layers of redundant managements, separate work from location and also restructuring work flows.

In order to maximize the advantages of information system in today's highly globalized and information based economy there is a greater need to plan the organization's information architecture and infrastructure.

3.4 CLASSIFICATION OF INFORMATION SYSTEM

There are six major types of information system. These are:

1. Transaction Processing System (TPS)

This is also referred to as data processing system. It performs the essential role of collecting and processing the daily transactions of the organization. They serve at operational levels of the organization. Examples of transactions include purchases payroll, reservation, invoices, payments, shipping, registrations, orders and sales.

Characteristics of Transaction Processing System

(i). It has a pre-specified system meaning that their functions, decision rules and output format cannot usually be altered by the end-user.

(ii). Transaction processing system are directly related to the structure of the organization's data.

(iii). It can cope with voluminous and wide range of data types and output formats.

(iv). To change the data processed or function performed by the transaction process system, it will require the intervention of information system specialists such as system analysts and programmers. 3

(v). It makes use of any readily available application package.

2. Management Information System (MIS)

This is an application of information system that provides management oriented report in predetermined fixed format. MIS helps managers on planning monitoring and controlling business operations by providing weekly, monthly or yearly results and not daily activities. Examples of MIS are budget fore-casting and analysis, financial reporting, inventory reporting, production scheduling, salary analyses, sales forecasting and sales reporting.

3. Decision Support System (DSS)

It is an application of information system that helps users to make decisions by providing useful information that supports unstructured decisions (i.e. decision making situations that cannot be predicted) whenever a decision making situation arises. DSS also serve at the management level of the organization. When it is applied to executive managers, these systems are sometimes called executive information system (EIS).

Decision support system does not actually make decision or solve problems but people do. It is only concerned with the provision of useful information to support the decision process. Users and Managers use DSS tools to access data warehouse to get relevant information. A data warehouse is a read-only informational database that contains detailed information generated by other transaction and management information systems.

4. Expert System

This is an extension of the decision support system. It is a programmed decision-making information system that captures and reproduces the knowledge and expertise of experts and then simulates the thinking or actions of that expert to help users with less expertise. These applications are implemented with Artificial intelligence (AI) technology. Artificial intelligence is a computer based technology that has the ability to behave like humans, learn languages and emulate human expertise and decision making.

5. Office Automation System

This system supports a wide range of business activities. Office systems are applications designed to improve workflow and communicate among workers regardless of their physical locations. Typical office system handles and manages document (through word processing, desktop publishing, document imaging and digital filings), scheduling (through electronic calendars) and communication (through electronic mail, voice mail and video conferencing).

6. Personal and Work Group Information Systems

Personal Information System is the system designed to meet the needs of a single user while work group system is to meet the needs of a workgroup and to increase the productivity of the group.

3.5 INFORMATION SYSTEMS ARCHITECTURE

System architecture can be defined as a set of conventions, rules and standards employed in a computer system's technical framework including customer requirements and specifications, that the system's manufacturer (or a system integrator) follows in designing (or integrating) the system's various components (such as hardware, software and networks). 4

Information system architecture on the other is the unifying framework into which various people with different perspective can organize and view the fundamental building blocks of information. Figure 2.1 shows an information systems framework with each group of stakeholders and their view of information system. The stakeholders in information system architecture are: system owners, system users, system designers, system designer and system analyst.

Classification of Stakeholders

1. System owners

System owners are those people responsible for the budgeting of money and time to develop, build and maintain the system. They own the system, set priorities for the system and determines policies for its use. In some cases, system

2. System Users

These are the people that actually use the information system to perform or support the work to be completed. System users define the business requirements and performance expectations for the system to be built.

3. System Designers

They are the technical specialist that designs the system to meet the user's requirements. They may also be system builders. They design the computer files, database, inputs, output, screen networks and programs which respond to requirements and constraints.

4. System Builders

These are the technical specialists that construct, test and deliver the system into operation.

5. System Analyst

The role of system analyst is to facilitate information systems development by analyzing different views of each stakeholder and ease the communication between the various stakeholders.

Analysis of Different Views of Stakeholders

System Owners View: An average system owner is not interested in raw data. He is only interested in information that adds new business knowledge.

System User' View: Users are very familiar data capturing, storing, processing and editing. They manipulate data of the system on regular basis and they are concerned with current data

implementation. System users are also responsible for defining the data requirements i.e. representations of users' data in terms of entities, attributes, relationship and rules.

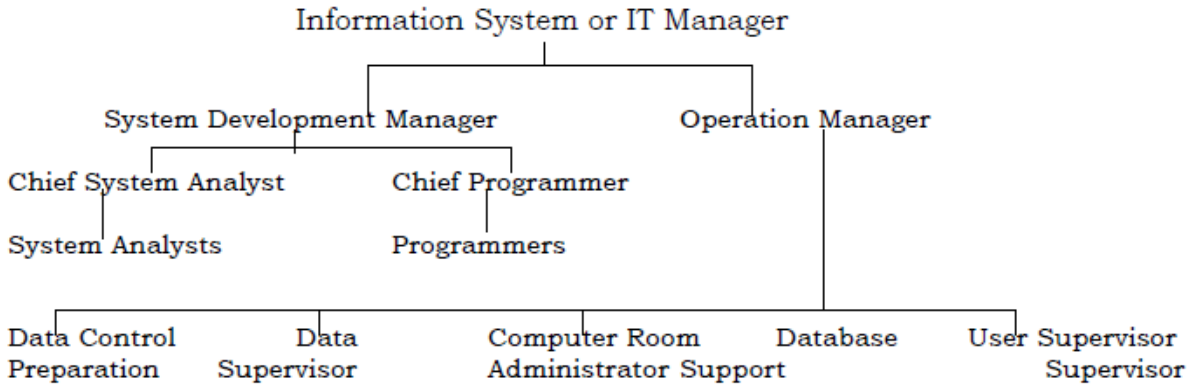
System Designer's View The view of designer is limited by the technology used by their information systems. Chosen technology has to be used, and the designer are responsible for translating users' data requirements into computer files and focuses on an application scheme i.e. a model that communicates how selected business processes are, or will be implemented using the software and hardware.

System Builder's View They implement data in details and precise language. Their view of the data is the most technological oriented way and closest to the database technology foundation such as structured query language (SQL).

3.6 INFORMATION SYSTEMS DEPARTMENT

In most organization there is always a separate unit that is responsible for the maintenance of their hardware, software, data storage technology and networks comprising the firm's information technology (IT) infrastructure. This unit is called the information system department.

The essence of this section is to briefly look into a typical information system department and the responsibilities of the people who staff it. Rather than calling it information system, some organizations call it data processing, IT or information system department.



Organization Chart of Information Systems or IT Department

A. Information System Manager

The information system or data processing manager is the overall boss of the department that is expected to play a part in deciding the overall goals and plans of the organization and in ensuring that information system department runs smoothly.

Responsibilities of Information System Manager

(i). He or she is the key figure in the organization with the responsibilities of all the data processing activities.

(ii). He ensures that the data processing needs of the organization are met within the policy guidelines laid down.

(iii). He prepares the annual budgets for the computer or data processing department.

(iv). The manager generates program that can develop the staff e.g. trainings, seminars and workshops.

(v). He or she interprets and executes policies defined by the directors or board of directors of the organization. 6

B. System Development Manager

The system development manager is responsible for the overall development of new project and the maintenance of existing software and the database. He also sets up standards for system design, programming and documentation, and allocates staff analysts and programmers to projects.

C. System Analysts

These are specialists that determine the information needs of the system users and produce a system design in accordance with these. He is charged with the important task of bridging the gap between the system user and the technical designer.

Responsibilities of System analyst

(i). A system analyst understudies existing system with a view to their application to a computer.

(ii). To design a computer-based system implementation and review.

(iii). To carry out feasibility studies on potential computer application and determine its economic viability.

(iv). He is responsible for the preparation of outline system specification to demonstrate how new system would operate.

(v). He coordinates the activities under his jurisdiction.

D. Programmers

These are highly trained technical specialists who write software instructions.

Responsibilities of Programmers

(i). Encodes and tests the procedures detailed in the design in a language suitable for the specified computer.

(ii). Liaise with the analyst and the user to ensure logical correction of program.

(iii). Produces all necessary program documentation.

(iv). Makes periodic checks in order to ensure operational systems meet up with the laid objectives.

(v). Preparation of progress schedules and target data for program testing and completion.

E. Operation Manager

The operation manager is responsible for the daily execution of the organization's data and information processing. Today the role is often much broader and include the responsibility of the following personnel:

- Data control staff
- Data preparation Staff
- Computer room staff
- Database Administrator
- User Support

Responsibilities of Data a Control Staff

(i). They ensure smooth flow of work through operations unit.

(ii). They are responsible for the co-ordination of all computer processing operations.

Responsibilities of Data Preparation Staff

(i). To prepare floppy disks from source documents or through other means e.g. direct data entry on-line.

(ii). To operate computer supporting devices such as floppy disk units, papers busters etc.

Responsibilities of Computer room staff

(i). They are in control of the day-to-day activities of the computer room.

(ii). Directs the work of the operators under him.

Responsibilities of Computer Operator

(i). Handles the hardware in the computer room e.g. input and output media.

(ii). Ensure that installation runs smoothly and step in when things go wrong.

User Support

They provide help for the users of computer devices such as workstation, personal computers and word processors in the form of installation and use of application packages, training in the correct use of devices etc

Database Administrator (DBA)

A database administrator (DBA) is a senior member of the computer centre staff that has acquired an extensive technical knowledge and experience in database management system and software.

Responsibilities of DBA

(i). To ensure that the data in the database meets the information needs of the organization.

(ii). He is responsible for the security of the database.

(iii). Ensures the appraisal of data held in the database that is complete, accurate and not duplicated.

(iv). Documentation of the data dictionary and manuals describing the facilities the database offers and how to make use of these facilities.

(v). Administers the company's database.

SUMMARY

Information system can be defined as the total apparatus or set of interrelated components that collects, process, store and distribute information within the organization for coordination and decision making.

The six major types of information system are: 1. Transaction Processing system (TPS), 2. Management Information System (MIS), 3. Decision Support System (DSS), 4. Expert 8

System, 5. Office Automation System and 6. Personal and Work Group Information *System*

Information system architecture is the unifying framework into which various people with different perspective can organize and view the fundamental building blocks of information. The stakeholders in information system architecture are: system owners, system users, system designers and system analyst.

In most organizations there is always a separate unit that is responsible for the maintenance of their hardware software, data storage technology and networks comprising the firm's information technology infrastructure.

The various people who staff it are: Information system Manager, System Development Manager and operation Manager. Also included are Chief system analyst, chief programmer, system analysts and programmer; data control supervisor, database administrator, user support, data control staff and computer operator.

REVIEW QUESTIONS ON CHAPTER THREE

1. (a) Draw a hierarchical structure of a computer department.

   (b) Briefly outline the responsibilities performed by the following staff:

(i) Information system / technology manager

(ii) System analyst

(iii) Programmer

(iv) Data Preparation Supervisor

(v) Data Control Supervisor

2. (a) Define the term information system

(b) State the merits and limitations of an information system

3. Write Short notes on the following types of information system

(i) Transaction processing system

(ii) Management Information System

(iii) Expert System

(iv) Office automation system

(v) Personal and work group information systems

4. State the three functions each of the following IT personnel

(i). Computer programmer

(ii). Computer Analyst

(iii). Computer Librarian

CHAPTER 4

DEVELOPING AN INFORMATION SYSTEMS

4.1 METHODS OF SYSTEM DEVELOPMENT

There are so many methods of system development. Some of these are:

(1) System Life Cycle

(2) Prototyping

(3) Application Software Packages

System Lifecycle

System lifecycle is a traditional methodology used in developing an information system which divides the development process into formal stages that must be completed sequentially with a formal division of labour between end user and information system specialists.

This method of system lifecycle is the oldest for building information system and is still very in use till today. The method assumes that an information system has a lifecycle akin to that of a living organism with a beginning, middle and an end. The lifecycle of an information system has six stages with each stage completed before the commencement of the next one.

Stages in System Lifecycle

The stages involved in system lifecycle starts from the physical aspects of the existing system (system investigation) through logical analysis (system analysis) and logical design (system design) on to the physical aspects of the new system (i.e. detailed design, implementation and evaluation.

Stage 1: System Investigation

This is the stage that determines whether an organization has a problem. And if it has, can it be solved by modifying the existing system or by building a new system? Moreover, the stage identifies its general objectives, scope of the project and proposes a project plan to the managements.

Stage 2: System Analysis

This stage analyses the problems of the existing systems in detail. It also identifies the objectives to be attained by the solution to these problems and alternative solution. Moreover, the stage examines the feasibility of each of the solution and the alternative for review by the management. This stage requires extensive information about the existing system which will be used to determine the information systems requirements. This information can be obtained through the following reports and work papers produced by the existing system:

- Polling the user with questionnaire and conducting interviews.
- Observation of how the system works
- Sifting through documents.

Stage 3: The Design Stage

This stage produces the logical and physical specifications for the solution to the proposed system. The lifecycle emphasizes formal specification and paper work, and also employs so many design and documentation tools such as data flow diagrams, program structure charts or flowcharts.

Stage 4: Programming

At this stage the design specifications produced during the design stage are translated into program code.

Stage 5: Installation

The stage consists of testing, training and conversion from the old system to a new or modified system. During installation the system as specified is physically created. The hardware is purchased and installed; and the written programs are tested together. Then the end users and technical specialists are trained on how to use the new system. From this stage, the detailed documentation and procedure that will govern the operation of the new system are drafted.

Stage 6: Post Implementation

This is the final stage of the system lifecycle in which the system is used and evaluated while in production. Users and technical specialists go through this stage to determine how well the new system has met its original objectives, whether there is any need for revisions or modifications.

Benefits of Lifecycle Approach

(i). System Lifecycle can be used to build large transaction processing system (TPS) and management information system (MIS)) where requirements are well structured and well defined.

(ii). System lifecycle approach is very appropriate for complex technical systems such as space launches, air traffic control and refinery operations.

Limitations of System Lifecycle

(i). System lifecycle is not a suitable approach for decision oriented application where decision makers will need to concretize their experiments to ascertain the kinds of decisions they wish to make.

(ii). This method of system development is costly and time consuming as a lot of time is spent from the preliminary stage to the post implementation stage.

(iii). The method is not flexible hence it does not encourage the development of a new system. This is because whenever an error occurs in the course of developing a new system the sequence of the life cycle activities may have to be repeated.

4.2 PROTOTYPING

Prototype is a small-scale but working sample of a desired system designed for the purpose of demonstration and evaluation. Prototyping consists of building an experimental and inexpensive system for end user to evaluate. Once the model is certified to conform with the user's requirements, the prototype can then be converted to a polished production system. 11

The process of building a preliminary design involves trying, refining and trying again is referred to as *iterative process* of systems development. This is because the steps required to build a system can be repeated over and over again (Laudon, K.C. et a,l 2001). Prototyping is more iterative than the conventional lifecycle and it encourages system design changes.

Steps in Prototyping

This method of system development is a four-step model consisting of the following:

Step 1: Identification of the User's Basic Requirements

At this initial stage the system designer which is expected to be an information specialist and familiar with the end user of the existing system capture the information needs.

Step 2: Development of an Initial Prototype

The system designer builds a working model (prototype) using fourth generation programming language, interactive multimedia computer aided software engineering (CASE).

Step 3: Use of the Prototype

At this level the users are encouraged to experiment the prototype to know whether it meets their requirements or make suggestions for improving the prototype.

Stage 4: Revision and Enhancement of the Prototype

The system builder takes note of all the changes the user requests and refines the prototype. After the revision of the prototype, the cycle returns to step 3. And step 3 and 4 are repeated until the user is satisfied. When there is no more iteration, the approved prototype then becomes an operational prototype that furnishes the final specifications for the application.

Benefits of Prototyping

(1). This method of systems development is valuable for the design of an information system where the end user interacts with the system.

(2). Prototype is very useful when there is uncertainty about the requirements or design solutions.

(3). The method is flexible as it enables end-user involvement throughout the systems development.

(4). Prototyping method produces systems that fulfill user requirement.

Limitations of Prototyping

(1). The approach is not suitable to build a complex technical system that relies on heavy calculations.

(2). The system does not accommodate large number of users in a production environment.

(3). Because the system changes easily, proper documentation may not be kept up to date.

(4). Prototyping system may end up with poor control since focus is on what the user wants. 12

4.3 APPLICATION SOFTWARE PACKAGES

Another alternative method of developing an information system is by purchasing an application software package. As already discussed in chapter six, an application software package is a prewritten and pre-coded suites of programs which are commercially made available for individuals and organizations to carry out their business functions thereby eliminating the need for them to write their own software programs.

This approach is flourishing because there are many applications packages that are common to all business and a generalized system will fulfill the requirements of many organizations such as payroll general ledger or inventory control. The advantages and disadvantages of this approach have been discussed in chapter six.

4.4 FEASIBILITY STUDY AND REPORT

Feasibility Study is a process of defining exactly what a project is and what strategic issues need to be considered to access its likelihood of succeeding. Also, it is a part of system analysis process that determines whether the solution is achievable given the organization resources and constraints.

One of the reasons for carrying out a system investigation is to establish the feasibility of introducing a computer system. This will provide some estimates of the likely costs and benefits of a proposed system. The reason for this study to establish whether at an early stage the project is realistic, which has to be done with minimum expenditure.

The major categories of feasibility are:

- ***Technical Feasibility***: This is a measure of practicality of the proposed technical solution with the availability of technical resource and expertise.
- ***Economic Feasibility***: It is a measure of the cost effectiveness of a project or the solution. It determines whether the benefit of a proposed solution outweighs the costs. This is often referred to as *cost benefits analysis.*
- ***Operation Feasibility***: This determines how well the solution will work in the organization, and a measure of how people feel about the project.
- ***Schedule Feasibility***: This measure how reasonable the project timetable is.

Feasibility Report

This is a report that is written by an analyst and presented to the management for consideration before allowing the project to continue. The feasibility report to be presented must incorporate the following:

- Principal work area of the project
- Need for specialist staffs in the later stages
- Possible improvement of the existing system
- Recommendation

4.5 FACTS FINDING METHODS

The analyst needs to gather all the information or facts about an existing system in order to discover the flaws in it and possibly eliminate them in the course of designing a new system. The various ways in which an analyst can use to gather information are:

(1). Interviews

This is probably the most important and widely used techniques an analyst can use to obtain facts. Interviewing is more of an art and improves with experience. During 13

the process of an interview the information about what is happening in a system is revealed with the opinions of the interviewee regarding the flaws in the system.

Moreover, the analyst must have a personal contact and co-operation of the interviewee and letting them to have the feeling that they have an important contribution towards the design of a new system procedure. Though, the major limitations to this method is that the interviewer because of the fear of job de-skilling or inability to cope with the new technology.

(2). Questionnaire

This is another fact-finding method used by the analyst. This method is very useful when little information is required from numerous people. Questionnaires save the time of the analyst, but are difficult to design and respond to. In designing questionnaire, it is very important to make the questions simple, straight forward and equitable. The analyst should also have a clear idea of the information required from the questionnaire.

(3). Observation

Observation is another source of information for the analyst and is best employed in conjunction with other techniques. It is a very direct method and provides a clear understanding of the procedures involved in an existing system to the observer. However, this method is time consuming for the analyst and does not reveal the viewpoint and attitude of people involved.

(4). Documentation

Most business organizations have charts, procedures, manuals and statistics that can reveal much useful information about a system to an analyst. The drawback with this method is that the analyst

has to read extensively in order to obtain small amount of useful information, unlike interviews where the analysts get direct information from the provided questions.

(5). Measurement

The system analyst can also gather information from the statistical information about the working of an exciting system. Although the information obtained through this method are not as detailed as the other methods.

SUMMARY

The term system development refers to all the series of activities that go into producing an information system as a solution to the challenge or problem facing the organization.

The various activities are: System Analysis, System Design, Programming*, Testing,* Conversion and, Production and Maintenance

Some of the methods of system development are: System Lifecycle, Prototyping and *Application software package,*

Feasibility study can be defined as the process of defining exactly what a project is and what strategic issues need to be considered to access its likelihood of succeeding. The major categories are: i. Technical Feasibility, ii. Economic Feasibility, iii. Operation Feasibility and iv. Schedule Feasibility

The various ways in which an analyst can use to gather information are: Interview, Questionnaire, Observation, Documentation and *Measurement.* 14

REVIEW QUESTIONS ON CHAPTER FOUR

1. a) What do you understand by the term system development cycle?

   b) Distinguish between system analysis and system design.

2. Briefly discuss the following methods of system development:

(a) System lifecycle (b) Prototyping (c) Application software package

3. Explain the following stages of system development in brief:

(a) Systems analysis (b) Systems design (c) Programming (d) Testing (e) Conversion

(f) Production and maintenance

4. Briefly explain the following facts finding methods:

(a) Interviews (b) Questionnaires (c) Observation (d) Documentation (e) Measurement