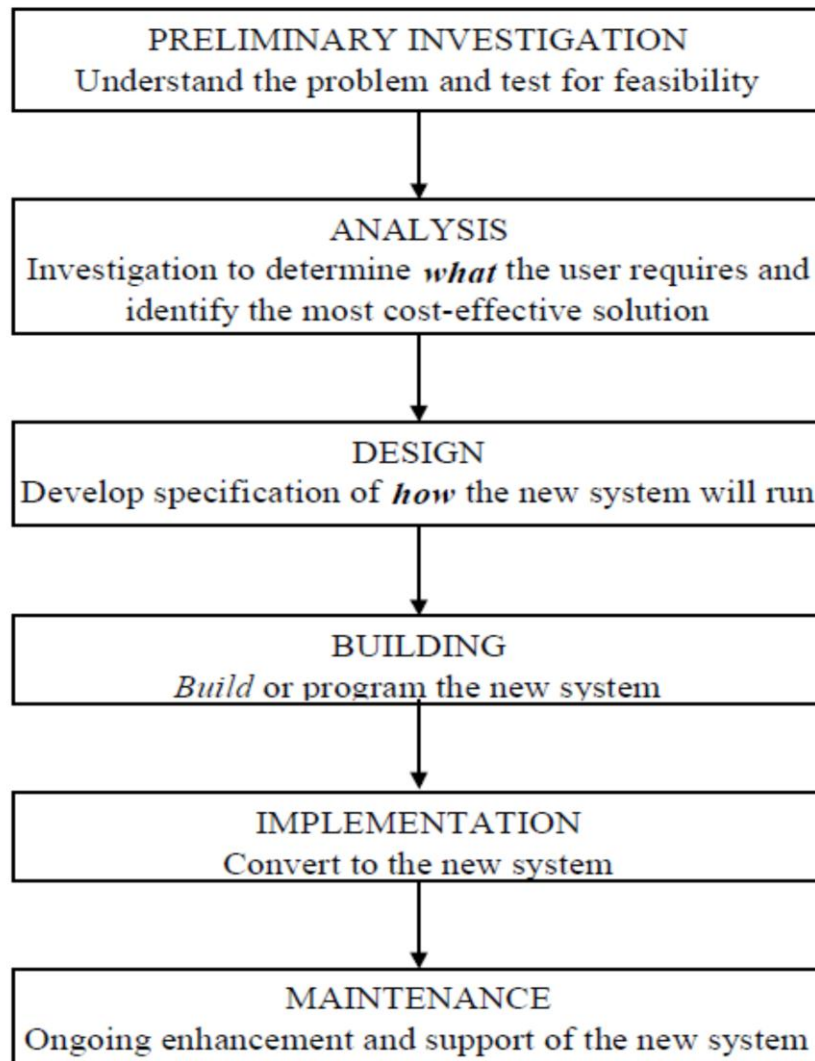


6.1 System Development:

Systems Development Life Cycle (SDLC)

Systems development could be seen as the simple process of writing programs to solve the needs of the user. Unfortunately the user knows what he wants but has no technical expertise while the programmer understands the computer but not the user environment. This communication gap between the customer and the service provider must be handled by middle, the systems analyst. The systems analyst translates user's needs into detailed specifications for implementation by the programmer. The SDLC normally covers the activities shown in figure below, each with a primary purpose.



Systems Development Process

1- Preliminary Investigation

The **preliminary investigation** is carried out to determine the scope and objectives of the new system and to investigate whether there is a feasible solution. At this stage an analyst or small project team is authorized to investigate the real potential of the new application. During this brief study the analyst must investigate the problem and the existing system sufficiently to be able to identify the true extent and purpose of the new application.

2- Systems Analysis

In this stage the analyst investigates the needs of the user and develops a conceptual solution to the problem. The analysis phase should include the following discrete steps: **Understand** how the existing system operates. **Document** the current physical system. **Define** the problem areas. **Identify** new requirements. **Identify** possible solutions. The conclusion of the analysis stage is the preparation of the formal **user requirement specification** (URS) that incorporates a logical model of a system that will meet the user's requirements. Management is required to **review** the status of the project and to make its go/no-go decision.

3- Systems Design

The objective of the **design stage** is to determine exactly how the new system will work, and to communicate this information in a document referred to as the detailed systems specification. There are three main objectives which the designer has to bear in mind while evolving and evaluating a design:

- **Performance.** How fast the design will be able to do the user's work given a particular hardware resource.
- **Control.** The range to which the design is secure against human errors, machine malfunction.
- **Changeability.** The ease with which the design allows the system to be changed to, for example, meet the user's needs to have different transaction types processed.

4- Systems Build

In this stage we program the new system. The programming stage can be undertaken as a number of separate tasks, performed in parallel. Programmers can code, data base administrators set up the database, hardware suppliers install and test networks and equipment, and we can begin to train the end-users to prepare them for the implementation phase. The analyst must develop a detailed project implementation plan to ensure tasks are scheduled and delays are quickly identified and addressed.

5- Systems Implementation:

This requires the transition of the completed system into the operational environment, and includes the following tasks (some of which will already have been started in earlier phases):

- Installation and testing of any new hardware, systems software and network infrastructure.
- Train users and operations staff.
- Transfer data (data conversion) from the manual or old system to the new database where necessary.
- Perform acceptance testing. This requires careful planning to ensure all data flows, error procedures, interfaces, controls and manual procedures are tested.
- Complete project documentation.

6- Maintenance

Finally resources will be required to maintain and enhance the system over its operational life which can vary between 4 and 10 years. There are many systems in existence that are still supported by the original developer; and all knowledge of the system exists only in that individual's head. The problem is that when this person leaves, there is no one with any knowledge of the system and the organization is at risk. Research has shown that this is the most expensive stage of the life cycle.

6.2 Critical success factors:

A number of factors have been identified that are critical to ensuring the success of a systems development project:

- Well defined system objectives.
- Careful test of possibility.
- Top management support.
- User involvement to ensure strong commitment.
- Hard analysis to ensure detailed, unambiguous user requirements.
- Complete detailed design to ensure an efficient, quality, maintainable system.
- Project management to ensure the development team is managed and controlled.

6.3 Using Information System:

Many factors can affect the ability of an information system to achieve its goal of supporting business processes. Before an information system is developed, a cost benefit study should be completed, and user requirements must be carefully analyzed to ensure that it will provide the appropriate functionality. During the system development process, organizational standards need to be followed. But over and above these planning issues, the final measure of success for an information system depends on how it is *used* – are employees happy to incorporate it into their data processing activities; does it deliver the information that they need; is the integrity of information guaranteed; can human or technical problems be identified and corrected? No matter how carefully a system has been developed, there are still potential problems associated with its use in the real world, which need to be included in an IS management strategy.

6.3.1 Change Management

One of the main reasons that information systems fail, is that users resist change. Many individuals believe that their skills and experience will be of less value in an automated environment, which threatens their job or status. Users may refuse to adapt to new methods of working, or while using the new system may attempt to weaken its efficiency. Acceptance of the system can be improved through the implementation of a change management strategy.

6.3.2 Ethics

The increased use of information systems in business has given rise to new chances for behavior that could affect the organization, its employees and its customers. Four major areas of ethics that are affected by information technology are *privacy, property, accuracy* and *access*.

6.3.2.1 Privacy

Most companies store information about their customers and staff in business databases – not only details like names and addresses, but also transaction histories, payment records, etc. One ethical issue respects the *privacy* of that information.

6.3.2.2 Property

Computer software and data has been the subject of a number of ethical issues related to *property*. Software piracy (the copying of copyrighted software) is illegal, if you are confident that you can get away with copying your friend's tutorial preparation, do you think that it is acceptable to do so? Copying of other people's ideas without acknowledgement is *stealing*, which is generally regarded as unethical even if society does not always consider it to be illegal.

6.3.2.3 Accuracy

Accuracy of information at the transactional level can be controlled through validation checks within the database and software design. Individuals are allowed by law to check and correct personal information that is stored in business databases. Since the users of information systems are human and fallible, the use of technology alone will not prevent the production of inaccurate information, either purposely or by accident. Again, the growth of the Internet has made the distribution of incorrect information extremely difficult to control.

6.3.2.4 Access

Access to information can be protected through the use of technology, such as passwords, electronic and biometric controls. Databases can allow or limit access for different types of users. Employees who have access to organizational computing resources are often guilty of harming the privilege by using company time and equipment for personal searches such as emailing and web searching.

6.3.3 Data Processing Controls

An important function in computer auditing is the review and analysis of information systems security. One element of this is physical access control; another is software-based data processing controls that are intended to prevent data errors from occurring, to identify any errors that have occurred, and to assist with recovery from errors. Validation checks may be built into the database structure, or coded as part of a software application, to apply business rules. Network and database access may be limited, and network monitoring software keeps track of which users log on to the system, what files they access, and what changes they make.

6.3.4 Disaster Recovery

Natural disasters, theft, viruses – any of these can result in damage to, an organization's information systems. A disaster recovery plan is needed to document how the business would be able to recover from either the total loss of computing capabilities, or else the interruption of critical services.

Regular **backup** of data and programs is the first essential for recovery from accident. Backups should be kept off-site and in a fireproof container or safe, and should be tested at intervals to ensure that the restore procedures function successfully.

Some disasters can be minimized through avoidance and early warning systems. An *uninterrupted power supply (UPS)* will prevent data corruption resulting from power points, and in the event of a total power failure, can run the system for a limited period before shutting it down without data loss.

Temperature control systems, smoke detectors and water sprinklers or gas fire suppression systems should be installed to reduce fire risk, while physical controls such as door locks and alarm systems will protect against unauthorized intruders.

Expert systems can be used to monitor the network for faults and to protect against communications threats such as viruses and hackers.

6.3.5 How IS Affects You

Perhaps the best way to illustrate the importance of IS, is to consider the impact that it has on your own life. Try to imagine what your daily life would be like without information systems:

Can you also imagine no television, no cellphone, no fax, and the end of mass air travel as we know it, the failure of the banking system...? Most of our lives would be affected dramatically.

Technology alone is not the solution to business problems – computers are simply one element of a complete system intended to support the flow of information within a business environment.