Accounting Information Systems (AIN1501)

Part 4 - Topic 7

Study Unit 13 – System development lifecycles

This study unit deals with the development of an information system and different development lifecycles. The advantages and disadvantages of the different development approaches are discussed in detail.

What is information system development?

Information system development is the process of creating a new information system or modifying a current information system. By employing information technology to develop a system, problems or opportunities are transformed into solutions.

Reasons why an information system need to be replaced or improved

We have already said that all business systems should be open systems and these are constantly influenced by changes in the environment.

Typical changes include the following:

-Changes in technology

-Changes in decision-making policies

-Changes in the needs and demands of users and stakeholders

-Changes in the business environment

-Changes in the nature of the organisation

-Changes to maintain a competitive advantage

-Changes to improve performance and productivity

Factors affecting the success of system development

System development can be considered successful if the system meets the needs of the users and the organisation on time and within budget. System development leaders have identified the following factors that can contribute to successful system development efforts at a reasonable cost:

-The extent of changes in the system

-The involvement of users and stakeholders

The planning of the project

-The selection of the developers used to develop the new system

-The use of project management tools

-Change management achieved by the new system

Re-engineering business processes

Re-engineering involves drastically rethinking and redesigning business processes, business structures and information systems to achieve a break- through in business results and to improve performance.

Re-engineering usually takes place before a new system is developed, or it takes place in the initial phases of system development.

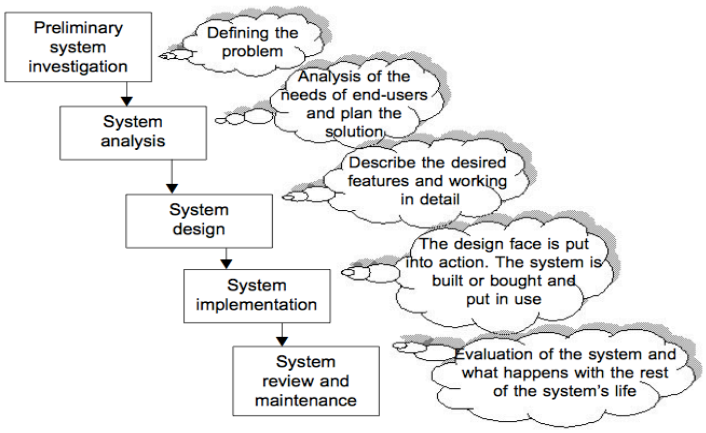
System development lifecycles

There are various approaches to the development of a new information system.

1. Traditional system development lifecycle (SDLC)

The development of an information system and meeting the needs of the business are complex, difficult and expensive endeavours.

An overview of a traditional SDLC:



Advantages and disadvantages of the SDLC:

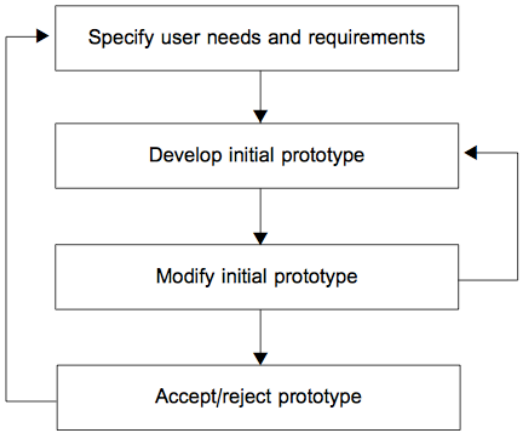
Advantages	Disadvantages
Less experienced staff can be used owing to the detailed guidelines and clearly defined stages.	Users cannot easily evaluate products to see if their needs are being met and their needs are often misunderstood because they are usually only involved in the planning stage.
Easy to manage. Control over the project is effective owing to revision at the end of each phase.	A stage cannot start before finishing the previous stage.
It ensures good documentation during all phases, simplifies maintenance and makes it possible to track system require-ments back to the organisation's needs.	Creation of documentation is expensive and time consuming and it is difficult to keep documentation current.
Consistency among all projects, which can reduce cost. Personnel can be transferred from one project to another.	Going back two or more phases is very expensive.
Progress can be measured and controlled.	It is difficult to measure the progress within the stages.

2. Prototyping

The development of new software is very expensive.

One way to cut this cost is to build a scaled-down experimental version of the new information system (Prototyping). Prototyping, also known as evolutionary lifecycle, means the end-users can identify what they do not want as opposed to what they do want.

An overview of prototyping:



Advantages and disadvantages of prototyping:

Advantages	Disadvantages
Prototyping leads to a better understanding of the user requirements.	It is difficult to contain the extent of the prototype and the project never seems to end.
Users can use the prototype system during the development process and they can provide useful feedback.	
It is more flexible than the final system and users' thoughts are stimulated and new ideas can be tested.	Each iteration builds on the previous one and the final system might only be incrementally better than the initial system.

Please refer to your study guide for more advantages and disadvantages of prototyping.

3. Rapid application development (RAD)

Rapid application development is a system development approach where work- shops and focus groups gather the requirements of the new system from the end-users. This method speeds up development. RAD makes the adapting of changes to system requirements easier and reduces paper-based documentation. User participation is facilitated and source code is automatically generated.

Advantages and disadvantages of RAD:

Advantages	Disadvantages
Time to deliver is less	Management complexity is increased
Changing requirements can be accommodated	Resource requirements may be increased
Progress can be measured	Suitable for a system that are component based and scalable
Cycle time can be short with use of powerful RAD tools	Suitable only when requirements are well known
Productivity with fewer people in a shorter period	Requires user involvement throughout the life cycle
Use of tools and frameworks	Suitable for projects requiring shorter development times

4. End-user development lifecycle

End-user development is a process where end-users develop their own applications, using existing application software, to solve their information needs.

Advantages and disadvantages of end-user development:

Advantages	Disadvantages
Encourages innovation and creative solutions	Loss of control over data
Faster design/implementation cycle	The new system is not adequately tested for errors
Makes users more involved in the reviewing and maintenance of the system	Duplication of effort and waste of resources
Leads to better productivity of users' work	Poor documentation created
Reduces communication problems between users and the information system and they will understand the system better.	Users are not trained as programmers
It will be more acceptable to users and they will take ownership of the system.	Loss of control of quality in both programs and data

Outsourcing the information system

Outsourcing the information system means obtaining some or all activities of the information system from an external service provider to handle all or parts of the data capturing and processing at a predetermined annual rate, rather than developing the organisation's information system internally.

On-site outsourcing: This is when the service provider provides the resources or facilities at the organisation itself.

Off-site outsourcing: This is when the service provider provides the service at a location other than at the organisation itself.

Blended outsourcing: This refers to a combination of on-site and off-site outsourcing.

Please refer to your study guide for the advantages and disadvantages are attached to outsourcing.

Summary

Organisations that use an information system that do not meet all users' requirements have a definite competitive disadvantage in the market. Therefore, organisations need to adapt their information system constantly, using the latest technology, upgrading the existing system, or acquiring a new system. The SDLC will lead them through this process. One of the advantages of using an SDLC model is that a project can be managed properly. It is therefore possible to ensure that the organisation makes the necessary progress. However, SDLC models do not guarantee that each step is completed successfully before the next one is started. If one of the steps were neglected, it will have a negative effect on the next step and the final result.