



Sessional Assignment

Information system and data processing

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(Lecturure)

Question No: 01

Define organization; also explain the structure of an organization by giving an example of a well known organization.

Ans:

organization refers to a collection of people, who are involved in pursuing defined objectives. It can be understood as a social system which comprises all formal human relationships. The organization encompasses division of work among employees and alignment of tasks towards the ultimate goal of the company.

It can also be referred as the second most important managerial function, that coordinates the work of employees, procures resources and combines the two, in pursuance of company's goals.

An organizational structure is a system that outlines how certain activities are directed in order to achieve the goals of an organization. These activities can include rules, roles, and responsibilities.

The organizational structure also determines how information flows between levels within the company. For example,

The World Health Organization (WHO)

ment of tasks towards the ultimate goal of the company.

The principal organs of WHO are the World Health Assembly, the Executive Board, and the secretariat, headed by a director-general.

World Health Assembly: All WHO members are represented in the World Health Assembly. Each member has one vote but may send three delegates. According to the WHO constitution, the delegates are to be chosen for their technical competence and preferably should represent national health administrations. Delegations may include alternates and advisers. The assembly meets annually, usually in May, for approximately three weeks. Most assemblies have been held at WHO headquarters in Geneva. A president is elected by each assembly.

The World Health Assembly determines the policies of the organization and deals with budgetary, administrative, and similar questions. By a two-thirds vote, the assembly may adopt conventions or agreements. While these are not binding on member governments until accepted by them, WHO members have to "take action" leading to their acceptance within 18 months. Thus, each member government, even if its delegation voted against a convention in the assembly, must act. For example, it must submit the convention to its legislature for ratification. It must then notify WHO of the action taken. If the action is unsuccessful, it must notify WHO of the reasons for nonacceptance.

In addition, the assembly has quasi-legislative powers to adopt regulations on important technical matters specified in the WHO constitution. Once such a regulation is adopted by the assembly, it applies to all WHO member countries (including those whose delegates voted against it) except those whose governments specifically notify WHO that they reject the regulation or accept it only with certain reservations.

Question No: 02

Explain System Development Life Cycle; also explain different types system development life cycle.

Ans:

The systems development life cycle (SDLC) is a conceptual model used in project management that describes the stages involved in an information system development project, from an initial feasibility study through maintenance of the completed application. SDLC can apply to technical and non-technical systems. In most use cases, a system is an IT technology such as hardware and software. Project and program managers typically take part in SDLC, along with system and software engineers, development teams and end-users.

Every hardware or software system will go through a development process which can be thought as an iterative process with multiple steps. SDLC is used to give a rigid structure and framework to define the phases and steps involved in the development of a system.

SDLC is also an abbreviation for Synchronous Data Link Control and software development life cycle. Software development life cycle is a very similar process to systems development life cycle, but it focuses exclusively on the development life cycle of software.

Types of Software developing life cycles (SDLC)

1. Waterfall Model

The Waterfall Model is a linear sequential flow. In which progress is seen as flowing steadily downwards (like a waterfall) through the phases of software implementation. This means that any phase in the development process begins only if the previous phase is complete. The waterfall approach does not define the process to go back to the previous phase to handle changes in requirement. The waterfall approach is the earliest approach and most widely known that was used for software development.

2. V-Shaped Model

It is an extension of the waterfall model, Instead of moving down in a linear way, the process steps are bent upwards after the implementation and coding phase, to form the typical V shape. The major difference between the V-shaped model and waterfall model is the early test planning in the V-shaped model.

3. Prototyping Model

It refers to the activity of creating prototypes of software applications, for example, incomplete versions of the software program being developed. It is an activity that can occur in software development and It used to visualize some component of the software to limit the gap of misunderstanding the customer requirements by the development team. This also will reduce the iterations may occur in the waterfall approach and hard to be implemented due to the inflexibility of the waterfall approach. So, when the final prototype is developed, the requirement is considered to be frozen.

Incremental prototyping: The final product is built as separate prototypes. In the end, the separate prototypes are merged in an overall design.

Extreme prototyping: used in web applications mainly. Basically, it breaks down web development into three phases, each one based on the preceding one. The first phase is a static prototype that consists mainly of HTML pages. In the second phase, the screens are programmed and fully functional using a simulated services layer. In the third phase, the services are implemented.

This process can be used with any software developing life cycle model. While this shall be chosen when you are developing a system has user interactions. So, if the system does not have user interactions, such as a system does some calculations shall not have prototypes..

4. Spiral Method (SDM)

It is combining elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts. This model of development combines the features of the prototyping model and the waterfall model. The spiral model is favored for large, expensive, and complicated projects. This model uses many of the same phases as the waterfall model, in essentially the same order, separated by planning, risk assessment, and the building of prototypes and simulations. It is used in the large applications and systems which built-in small phases or segments.

5. Iterative and Incremental Method

It is developed to overcome the weaknesses of the waterfall model. It starts with an initial planning and ends with deployment with the cyclic interactions in between. The basic idea behind this method is to develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental), allowing software developers to take advantage of what was learned during the development of earlier parts or versions of the system. It can consist of mini waterfalls or mini V-Shaped model.

It is used in shrink-wrap application and large system which built-in small phases or segments. Also, can be used in a system has separated components, for example, ERP system. Which we can start with the budget module as a first iteration and then we can start with the inventory module and so forth..

6. Agile development

It is based on iterative and incremental development, where requirements and solutions evolve through collaboration between cross-functional teams.

It can be used with any type of the project, but it needs more engagement from the customer and to be interactive. Also, we can use it when the customer needs to have some functional requirement ready in less than three weeks and the requirements are not clear enough. This will enable more valuable and workable piece for software early which also increase the customer satisfaction.

Question No: 03

Explain Incremental model and Spiral; also explain main difference between spiral and incremental model.

Ans:

Incremental Model is a process of software development where requirements divided into multiple standalone modules of the software development cycle. In this model, each module goes through the requirements, design, implementation and testing phases. Every subsequent release of the module adds function to the previous release. The process continues until the complete system achieved.

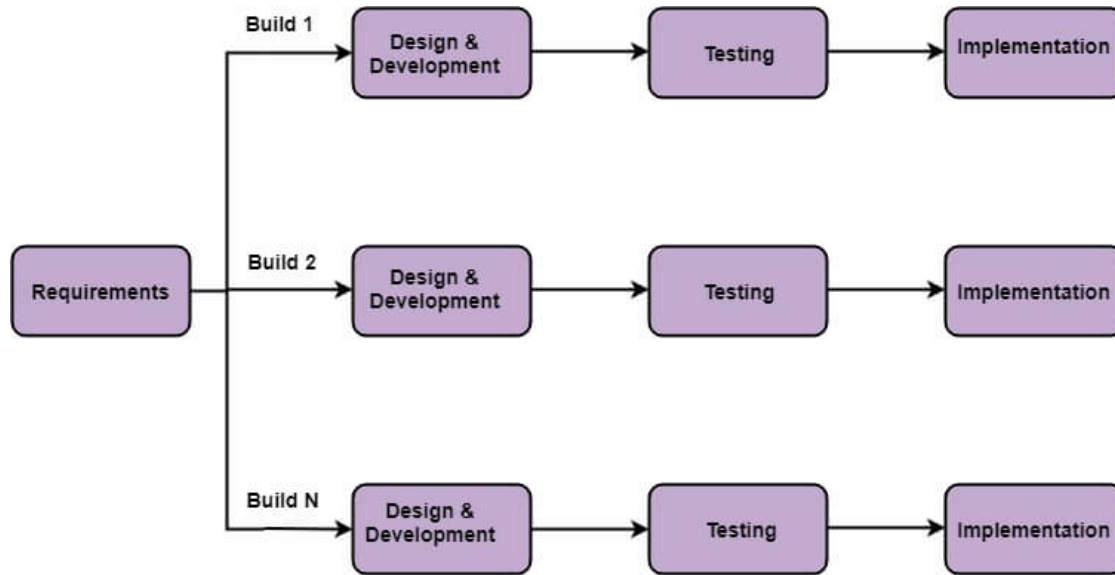


Fig: Incremental Model

The various phases of incremental model are as follows:

1. Requirement analysis: In the first phase of the incremental model, the product analysis expertise identifies the requirements. And the system functional requirements are understood by the requirement analysis team. To develop the software under the incremental model, this phase performs a crucial role.

2. Design & Development: In this phase of the Incremental model of SDLC, the design of the system functionality and the development method are finished with success. When software develops new practicality, the incremental model uses style and development phase.

3. Testing: In the incremental model, the testing phase checks the performance of each existing function as well as additional functionality. In the testing phase, the various methods are used to test the behavior of each task.

4. Implementation: Implementation phase enables the coding phase of the development system. It involves the final coding that design in the designing and development phase and tests the functionality in the testing phase. After completion of this phase, the number of the product working is enhanced and upgraded up to the final system product.

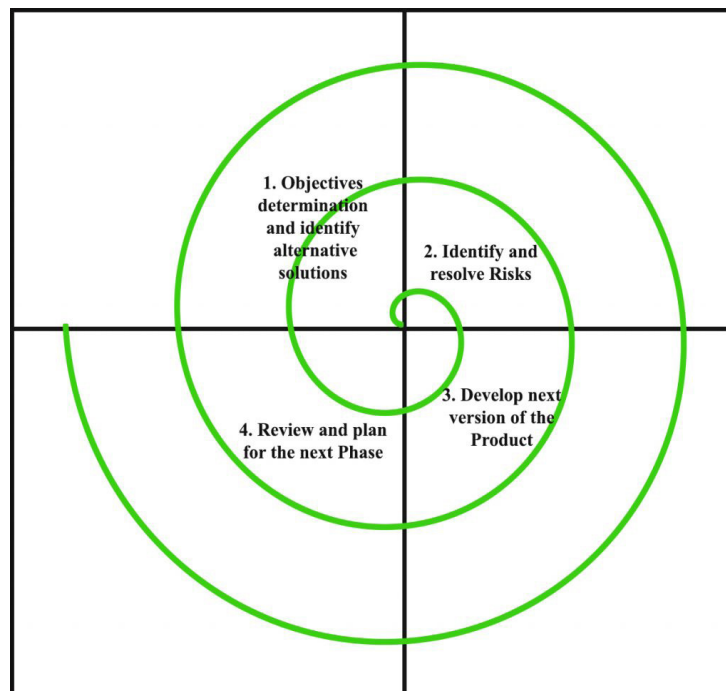
When we use the Incremental Model?

- When the requirements are superior.
- A project has a lengthy development schedule.
- When Software team are not very well skilled or trained.
- When the customer demands a quick release of the product.
- You can develop prioritized requirements first.

Spiral model is one of the most important Software Development Life Cycle models, which provides support for Risk Handling. In its diagrammatic representation, it looks like a spiral with many loops. The exact number of loops of the spiral is unknown and can vary from project to project. Each loop of the spiral is called a Phase of the software development process. The exact number of phases needed to develop the product can be varied by the project manager depending upon the project risks. As the project manager dynamically determines the number of phases, so the project manager has an important role to develop a product using spiral model.

The Radius of the spiral at any point represents the expenses(cost) of the project so far, and the angular dimension represents the progress made so far in the current phase.

Below diagram shows the different phases of the Spiral Model:



Each phase of Spiral Model is divided into four quadrants as shown in the above figure. The functions of these four quadrants are discussed below-

1. Objectives determination and identify alternative solutions: Requirements are gathered from the customers and the objectives are identified, elaborated and analyzed at the start of every phase. Then alternative solutions possible for the phase are proposed in this quadrant.

2. Identify and resolve Risks: During the second quadrant all the possible solutions are evaluated to select the best possible solution. Then the risks associated with that solution is identified and the risks are resolved using the best possible strategy. At the end of this quadrant, Prototype is built for the best possible solution.

3. Develop next version of the Product: During the third quadrant, the identified features are developed and verified through testing. At the end of the third quadrant, the next version of the software is available.

4. Review and plan for the next Phase: In the fourth quadrant, the Customers evaluate the so far developed version of the software. In the end, planning for the next phase is started.

Main difference between spiral and incremental model.

A “**spiral model**” is a type of iterative model where the individual iterations in the spiral model take the form of mini-waterfalls. There are many other kinds of iterative models that are much simpler than the spiral model. For example, Scrum would be considered to be both an incremental and an iterative approach.

The **Incremental** approach is a method of software development where the model is designed, implemented and tested incrementally (a little more is added each time) until the product is finished. It involves both development and maintenance. The product is defined as finished when it satisfies all of its requirements

Thank You!