

Victoria University of Bangladesh
Name: Md. Ziaul Hoque "Sohel"
Student ID: 2221220031
Course Title: Software-Engineering-scaled
Course Code: CSI-321
Batch: 22nd (evening)
Semester: Summer-2023

Ans to the Que No 1(A)

Software Engineering:

Software engineering is a detailed study of engineering to the design, development and maintenance of software. Software engineering was introduced to address the issues of low-quality software projects. Problems arise when a software generally exceeds timelines, budgets, and reduced levels of quality. It ensures that the application is built consistently, correctly, on time and on budget and within requirements. The demand of software engineering also emerged to cater to the immense rate of change in user requirements and environment on which application is supposed to be working.

Ans to the Que No 1(B)

SDLC Model:

Waterfall Model

The waterfall is a universally accepted SDLC model. In this method, the whole process of software development is divided into various phases. The waterfall model is a continuous software development model in which development is seen as flowing steadily downwards (like a waterfall) through the steps of requirements analysis, design, implementation, testing (validation), integration, and maintenance.

RAD Model

RAD or Rapid Application Development process is an adoption of the waterfall model; it targets developing software in a short period. The RAD model is based on the concept that a better system can be developed in lesser time by using focus groups to gather system requirements.

Business Modeling

Data Modeling

Process Modeling

Application Generation

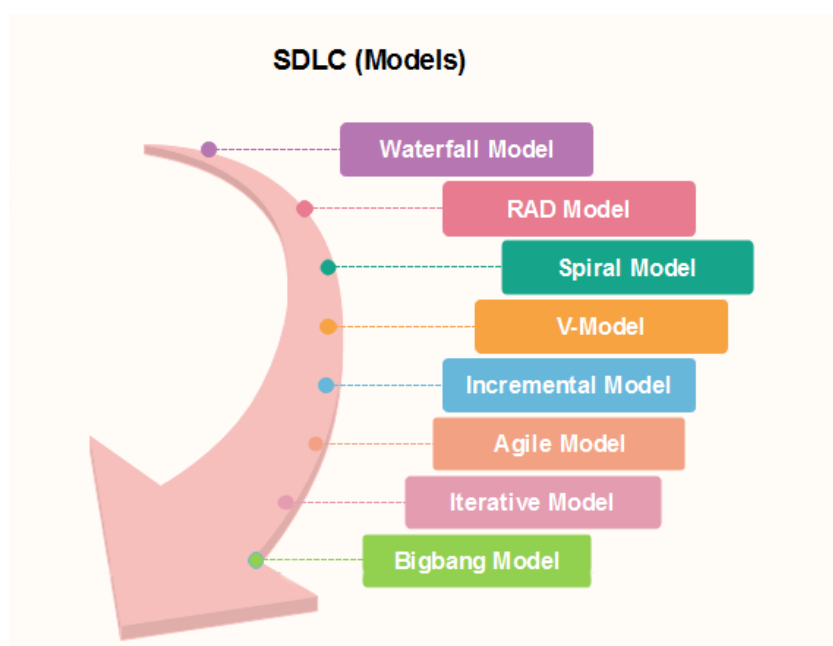
Testing and Turnover

Spiral Model

The spiral model is a risk-driven process model. This SDLC model helps the group to adopt elements of one or more process models like a waterfall, incremental, waterfall, etc. The spiral technique is a combination of rapid prototyping and concurrency in design and development activities. Each cycle in the spiral begins with the identification of objectives for that cycle, the different alternatives that are possible for achieving the goals, and the constraints that exist. This is the first quadrant of the cycle.

V-Model

In this type of SDLC model testing and the development, the step is planned in parallel. So, there are verification phases on the side and the validation phase on the other side. V-Model joins by Coding phase.



Incremental Model

The incremental model is not a separate model. It is necessarily a series of waterfall cycles. The requirements are divided into groups at the start of the project. For each group, the SDLC model is followed to develop software. The SDLC process is repeated, with each release adding more functionality until all requirements are met. In this method, each cycle act as the maintenance phase for the previous software release. Modification to the incremental model allows development cycles to overlap. After that subsequent cycle may begin before the previous cycle is complete.

Agile Model

Agile methodology is a practice which promotes continues interaction of development and testing during the SDLC process of any project. In the Agile method, the entire project is divided into small incremental builds. All of these builds are provided in iterations, and each iteration lasts from one to three weeks.

Iterative Model

It is a particular implementation of a software development life cycle that focuses on an initial, simplified implementation, which then progressively gains more complexity and a broader feature set until the final system is complete. In short, iterative development is a way of breaking down the software development of a large application into smaller pieces.

Big bang model

Big bang model is focusing on all types of resources in software development and coding, with no or very little planning. The requirements are understood and implemented when they come. This model works best for small projects with smaller size development team which are working together. It is also useful for academic software development projects. It is an ideal model where requirements are either unknown or final release date is not given.

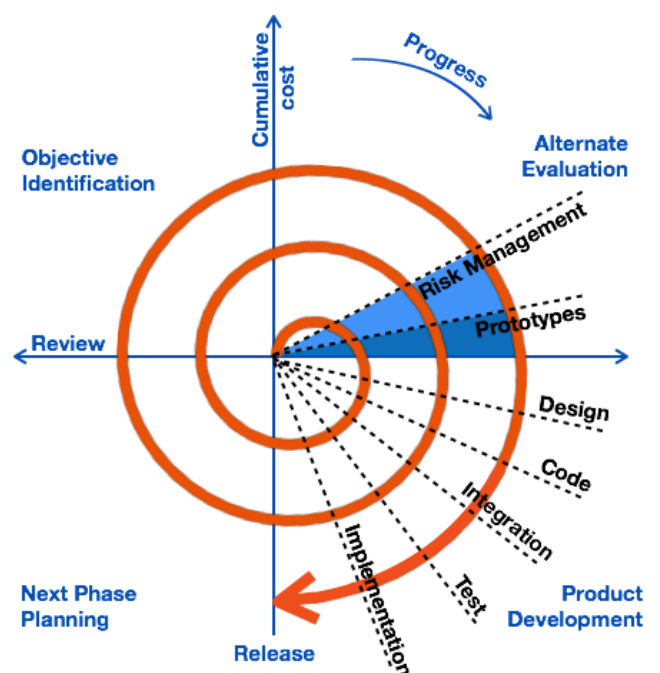
Prototype Model

The prototyping model starts with the requirements gathering. The developer and the user meet and define the purpose of the software, identify the needs, etc.

A 'quick design' is then created. This design focuses on those aspects of the software that will be visible to the user. It then leads to the development of a prototype. The customer then checks the prototype, and any modifications or changes that are needed are made to the prototype.

Spiral Model:

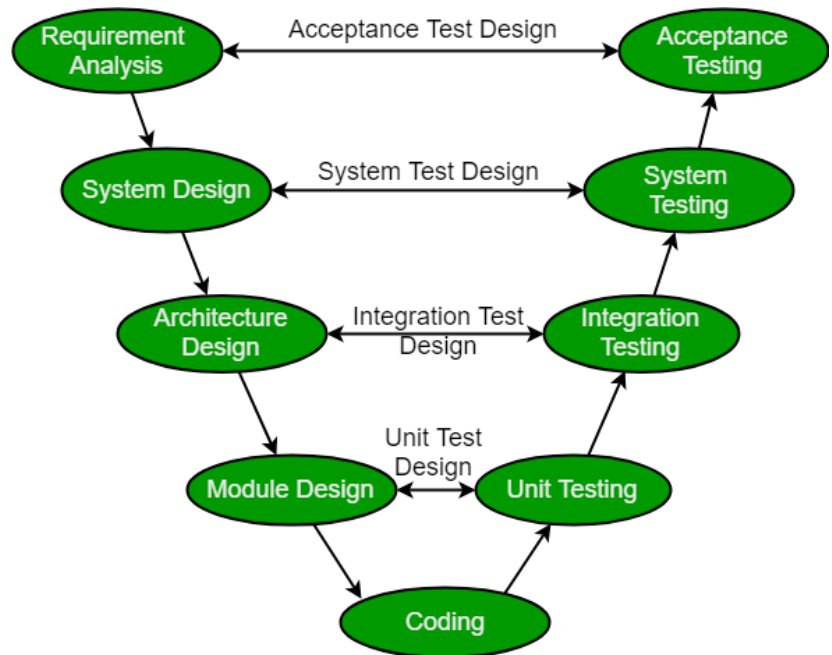
The spiral model is a risk-driven process model. This SDLC model helps the group to adopt elements of one or more process models like a waterfall, incremental, waterfall, etc. The spiral technique is a combination of rapid prototyping and concurrency in design and development activities. Each cycle in the spiral begins with the identification of objectives for that cycle, the different alternatives that are possible for achieving the goals, and the constraints that exist. This is the first quadrant of the cycle (upper-left quadrant). The next step in the cycle is to evaluate these different alternatives based on the objectives and constraints. The focus of evaluation in this step is based on the risk perception for the project. The next step is to develop strategies that solve uncertainties and risks. This step may involve activities such as benchmarking, simulation, and prototyping.



Ans to the Que No 1(C)

V-Model:

The V-model is a type of SDLC model where process executes in a sequential manner in V-shape. It is also known as Verification and Validation model. It is based on the association of a testing phase for each corresponding development stage. Development of each step directly associated with the testing phase. The next phase starts only after completion of the previous phase i.e. for each development activity, there is a testing activity corresponding to it. The V-Model is a software development life cycle (SDLC) model that provides a systematic and visual representation of the software development process. It is based on the idea of a "V" shape, with the two legs of the "V" representing the progression of the software development process from requirements gathering and analysis to design, implementation, testing, and maintenance.



Ans to the Que No 1(D)

Graphical User Interface (GUI):

GUI is the acronym for graphical user interface—the interface that allows users to interact with electronic devices, such as computers, laptops, smartphones and tablets, through graphical elements. It's a valuable part of software application programming in regards to human-computer interaction, replacing text-based commands with user-friendly actions. Its goal is to present the user with decision points that are easy to find, understand and use. In other words, GUI lets you control your device with a mouse, pen or even your finger. GUI was created because text command-line interfaces were complicated and difficult to learn. The GUI process lets you click or point to a small picture, known as an icon or widget, and open a command or function on your devices, such as tabs, buttons, scroll bars, menus, icons, pointers and windows. It is now the standard for user-centered design in software application programming. Programs that use GUI are known as "GUI programs." The program creates small pictures of tasks or functions and waits for the user to interact with them. The user controls when and how they will be used. To select functions, users can either use a keyboard, pointing device, such as a mouse, touchpad or touchscreen depending on the device

Ans to the Que No 2(A)

Project Manager:

A project manager is a professional who organizes, plans, and executes projects while working within restraints like budgets and schedules. Project managers lead entire teams, define project goals, communicate with stakeholders, and see a project through to its closure. Whether running a marketing campaign, constructing a building, developing a computer system, or launching a new product, the project manager is responsible for the success or failure of the project. The project manager role is in demand in just about every industry. Let's take a closer look at what project managers do, why you should consider a career in project management, and how you can get started.

Ans to the Que No 2(B)

Role of the project manager:

The project manager is the individual responsible for delivering the project. The individual leads and manages the project team, with authority and responsibility from the project board, to run the project on a day-to-day basis. In the NI public sector, Project's IN Controlled Environments2 (PRINCE2(external link opens in a new window / tab)) is the standard project management method and is applicable to all project types. As well as the formal responsibilities set out in methods such as PRINCE2, the project manager has an important role in interfacing between the project and the business area. This is important for communicating and encouraging the need for transformation and change within the business area in tandem with the delivery of new capabilities from the project. The readiness of the business to exploit the new capability is crucial to success. Without this state of readiness in the business, there are likely to be disruptions and delays in the plan for benefits realization.

Responsibilities of the project manager:

The project manager, operating within agreed reporting structures, is responsible for:

- Designing and applying appropriate project management standards for incorporation in the NI Gateway Review Process
- Managing the production of the required deliverables
- Planning and monitoring the project
- Adopting any delegation and use of project assurance roles within agreed reporting structures
- Preparing and maintaining project, stage and exception plans as required
- Managing project risks, including the development of contingency plans
- Liaison with programmed management and related projects to ensure that work is neither overlooked nor duplicated
- Monitoring overall progress and use of resources, initiating corrective action where necessary
- Applying change control and configuration management processes
- Reporting through agreed lines on project progress through highlight reports and end-stage assessments
- Liaison with appointed project assurance representatives to assure the overall direction and integrity of the project
- Maintaining an awareness of potential interdependencies with other projects and their impact

- Adopting and applying appropriate technical and quality strategies and standards
- Identifying and obtaining support and advice required for the management, planning and control of the project
- Managing project administration
- Conducting a project evaluation review to assess how well the project was managed
- Preparing any follow-on action recommendations

Ans to the Que No 2(C)

Objectives of Software Design:

Following are the purposes of Software design:

Correctness: Software design should be correct as per requirement.

Completeness: The design should have all components like data structures, modules, and external interfaces, etc.

Efficiency: Resources should be used efficiently by the program.

Flexibility: Able to modify on changing needs.

Consistency: There should not be any inconsistency in the design.

Maintainability: The design should be so simple so that it can be easily maintainable by other designers.



Objectives of Software Design

END