Session1-Explain

Importance of the SDLC

Session1-Explain the SDLC

What is SDLC?

- SDLC or System Development Life Cycle is also called software development life cycle.

- It is a plan that describes how to develop, maintain, replace and enhance a product or software.

- SDLC allows developers to analyse requirements.

- It helps reduce unnecessary costs during development.

SDLC has three primary business objectives.

- Deliver high-quality systems

- Provide strong management controls

- Maximise productivity

That's why developers use SDLC to estimate the costs at the initial stages and predict costly mistakes.

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Advantages of SDLC

Clear View of Problem or Goal:

SDLC helps provide a clear view of the problem or goal. You can see the goals and problems so that the plan can be implemented with precision and relevance.

Project Designed with Clarity:

SDLC helps design a project with clarity. Project members cannot move from one stage to another until the prior stage is completed and signed off by the project manager. A formal review is conducted at the end of each stage, which allows the project manager to have maximum management control.

Tested before Installation:

SDLC ensures that the software is properly tested before installation.
The installation process must undergo necessary quality checks and balances before entering the installation stage.

Well-Structured and Well-Documented:

SDLC ensures that the software is well-structured and well-documented.

If a key project member leaves, a new member can pick up the project from where the former has left.

The SDLC gives you a well-structured and well-documented paper trail of the entire project.

Well-Designed and Properly Ordered:

SDLC ensures that the software is well-designed and properly ordered.

If the paperwork is missing or incomplete, the new project member will have to start from the beginning. SDLC is designed in such a way that a new project member can take up the process without any

complications.

Project Manager can Properly Manage a Project:

SDLC helps the project manager manage a project properly. Sticking to a budget is easier with a well-organised plan in which you can see all the timetables and costs.

Project members can submit their work to an integrated system that flags anything past the due date.

When the project manager spends less time on micromanaging, then he or she can spend more time on improving efficiency and production.

Provides the Project with Flexibility:

SDLC helps provide flexibility in project execution.

The project will continuously loop around until it is perfect.

The stages are meant to give feedback to the earlier stages. So, the SDLC model provides the project with flexibility.

Designing and Implementing a Project:

SDLC helps design and implement a project. It is the best way to ensure optimal control and minimise problems.

It allows the project manager to run production without having to control every work of the project members.

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Benefits of SDLC

Proper Direction for Projects:

Most software development initiatives implement a fly-by-night approach, which leads to low-quality results.

In most cases, this results in:

• Over budget

• Delayed deliveries

• Failure to meet customer expectations

• Entire project might fail

Better scope management:

Many teams lack motivation because of projects whose scope constantly changes.

They also suffer when bandage solutions are often used due to poorly implemented processes.

However, with SDLC, developers have a roadmap where they can refer and improve the scope management and reduce development problems.

The structured cycle will certainly minimise the unexpected issues during a software development process.

Avoiding issues during development:

The absence of SDLC typically leads to several problems that will become more prevalent as the development progresses.

Lack of proper communication between the development team and customer can produce systems that do not meet the needs of the end-user.

Mistrust in the customer management staff impacts the development contractor maintaining a follow-on contract.

Another point to consider is that you will likely end up with defective deployments without basic processes or methodology concepts.

Delivering an unstable output negatively affects the company's reputation and developers' track record.

Identification of potential problems:

Following a well-defined methodology allows development teams to:

- Produce stable systems

- Ensure customers are informed

- Have a clear understanding of the task at hand

- Offer better estimates

- Identify potential pitfalls early in the project

Teams that adhere to the SDLC process will become more effective at determining issues before they even occur.

This will help the team eliminate problems and create better workarounds if they happen.

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Activity:

1. What is the full form of SDLC?

2. What are the three primary business objectives of SDLC?

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Phases of SDLC

There are seven phases in the system development life cycle.

- Planning

- Analysis

- Design

- Development

- Testing

- Implementation

- Maintenance

Planning Stage

Planning is the first and most important stage in SDLC.

- This stage is also called the feasibility stage.

- It primarily aims at defining a step-by-step plan on how to achieve or complete a project.

Analysis Stage

The second stage is analysis.

- It includes gathering all the specific details required for a new system and determining the first ideas for prototypes.
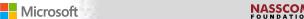
  Developers may:

- Define any prototype system requirements

- Evaluate alternatives to existing prototypes

- Create an SRS document

- SRS includes all the specifications for software, hardware and network requirements for the system they plan to build.

- It is the most important phase in SDLC, where all the information is gathered from customers, users and other stakeholders.

- This phase gives a clear picture of the scope of the project that helps finalise the timeline of the project.

Design Stage

Based on the outcome of the planning and analysis stages, developers in the design stage work on creating a design document.

This typically includes:

- User interfaces

- System interfaces

- Network and network requirements and

- Databases

They turn the SRS document into a more logical structure that can later be implemented in a programming language.

Operating, training and maintenance plans are drawn to indicate the developers' work at every stage of the cycle.

Development Stage

The development stage is where the actual work happens.

- Developers write the code and build software according to the design document created in the design stage.

- Developers follow the coding guidelines as defined by the organisation and utilise different tools such as compilers, debuggers and interpreters.

- This is the stage, where developers will choose the right programming language.

- Programming languages can include staples, such as C++, PHP and more.

Comment[S Ajay Kumar1]: The bullets are repeated in the testing stage. Is it by mistake or the same points apply there also?

Testing Stage

- The developed software must meet the quality standards that were defined in the SRS document. The testing stage aims at achieving the same.

- Developers follow the coding guidelines as defined by the organisation and utilise different tools such as compilers, debuggers and interpreters.

- This is the stage, where developers will choose the right programming language to be used.

- Programming languages can include staples, such as C++, PHP, and more.

Comment[S Ajay Kumar2]: The bullets are repeated in the testing stage. Is it by mistake or the same points apply there also?

Implementation Stage

- Once the product is tested and free from bugs, the product is ready for implementation.

- In this stage, the product is released in the market and implemented in the end-user system.

Maintenance Stage

The SDLC does not end when the software reaches the market.

Maintenance is required as part of SDLC.

This includes:

- Working on new bugs that were not identified during the testing stage and

- Solving new issues that come up due to user reports.

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Activity:

1. In which stage of the SDLC process, a detailed view for a new system is included?

2. What is the fifth stage of SDLC?

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Key Roles in SDLC Stages

Product Owner: The Product Owner is a business representative or voice for the stakeholders.

Another name for the Product Owners is Requirement Owners as they make sure that development is done according to the project requirements.

Project Manager: _The Project Manager can be considered as a team representative._

The Project Manager's task is to coordinate the work of the participants and organise meetings and negotiations.

Team Lead: Team Lead focuses on technical implementation and advises on how to translate initial ideas into technical solutions.

They also monitor the architectural logic of the product and solve other technical issues.

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How the Lead Roles Interact During Development

- PO creates tasks, prescribes requirements and sets priorities.

- Based on information about the team's estimates and velocities, the PM shows which scope part or all of the proposed tasks of the team can take into the sprint.

- PM draws up a commitment letter and after PO's approval, the team is ready to start the sprint.

- PM organises any necessary meetings for all project participants.

- TL helps shape the initial ideas into software solutions, builds the product's architectural logic and oversees other technical tasks.

- After implementing the sprint tasks, the PM prepares for Increment, Sprint Report and Test Report.

- The PO and stakeholders, such as the client's CEO, investors and other persons, pass on this information for review.

- This information is passed on for review by the PO and stakeholders, such as the client's CEO, investors and other persons.

- They provide feedback and make the final "go or no-go" decision, whether to release the achieved results or request for changes.

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Roles in Planning Stage

This stage focuses on discussing the purpose and goals of the project. It is important to evaluate all the resources required, such as the team and financial backing to move forward.

Roles involved in this stage are:

- Project Sponsor

- Product Owner

- Business Analyst

- UX/UI Designer and

- Project Manager

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Roles in Designing Stage

UX/UI Designer starts sketching and structuring the scenarios for building the product design. The designer creates and clusters the scheme to distribute physical components of the product, draft a layout and identify fundamental and incidental interactions.

UX/UI Designer starts the wireframing which shows an illustration of how the final software will look.

Roles involved in this stage are:

- Head of Product

- Product Owner

- Business Analyst

- UX/UI Designer

- Project Manager

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Roles in Coding Stage

The roles involved in the coding stage are:

- Head of Engineering

- Chief Technology Officer

- Technical Lead

- Frontend Engineer

- Backend Engineer

- Fullstack Engineer and

- DevOps Engineer

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Roles in Testing Stage

Check whether the code and the programming work are according to customer requirements.

Quality Engineer, Security Engineer and the leaders test scripts and interfaces according to:

- Quality assurance testing (QA)

- System integration testing (SIT)

- User acceptance testing

Roles involved in this stage are:

- Chief Technology Officer

- Project Manager

- Product Owner

- Quality Engineer

- Security Engineer

- Head of Product

- Head of Engineering

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Roles in Deployment and Maintenance Stage

Roles involved in this stage are:

- Chief Technology Officer

- Project Manager

- Product Owner

- Technical Support

- Database Analyst

- Head of Product

- Head of Engineering

- Data Scientist

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Role of System Analyst

An SDLC's system analyst is an overseer for the entire system.

The system analyst should be:

- Aware of the system and help guide the project by giving appropriate directions

- A domain expert in any skill required for the project

- A good communicator to steer his or her team to success

- A good planner so that the development tasks are carried out on time

Skills of Product Owner

The main responsibilities of the PO are to set the direction and priorities.

Some of the core skills required for a product owner are:

- Expertise in the business domain
- A strong understanding of the product, its requirements and its objectives.
- The ability to involve themselves in the process
- Competency in decision making
- Effective communication skills
- A vision for the future

Importance of Stakeholders

The stakeholder, manager and development specialist are the important roles played in the life of users.

Stakeholders are the investors; their participation is important in the success of the project.

Collaboration with the stakeholders throughout the SDLC will make sure that all steps are less painful and the time and money spent on rework are saved.

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Activity:

1. Which role in SDLC is also known as Requirement Owner?

2. At which stage does focus on discussing the purpose and goals of the project happen?

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