Software Development Life Cycle (SDLC)

The Software Development Life Cycle (SDLC) is a structured framework that guides the design, development, and testing of high-quality software.

It serves as a step-by-step methodology that ensures software is built efficiently while meeting user expectations.
The primary goal of SDLC is to deliver robust, maintainable, and cost-effective software within a defined timeframe.

By following a well-structured plan, each phase of the software development process operates seamlessly, ensuring smooth execution from ideation to deployment.

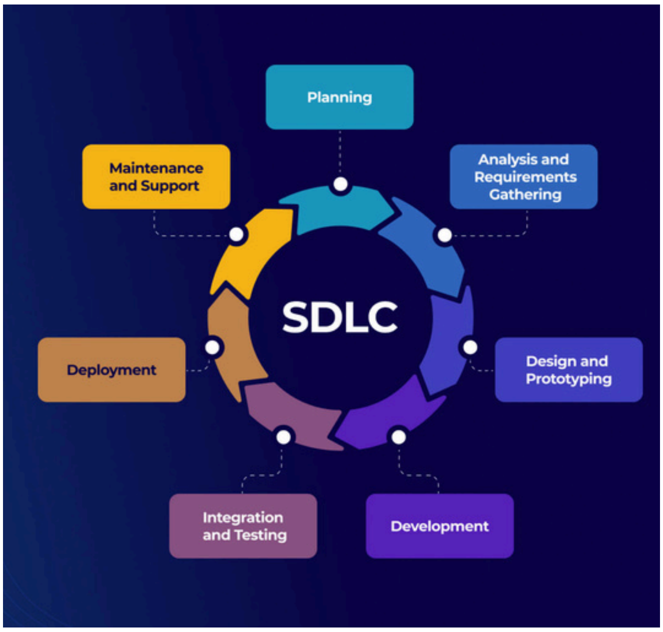
In this article, we will explore SDLC in detail, breaking down its stages and understanding how it helps in building powerful, reliable, and efficient software solutions.

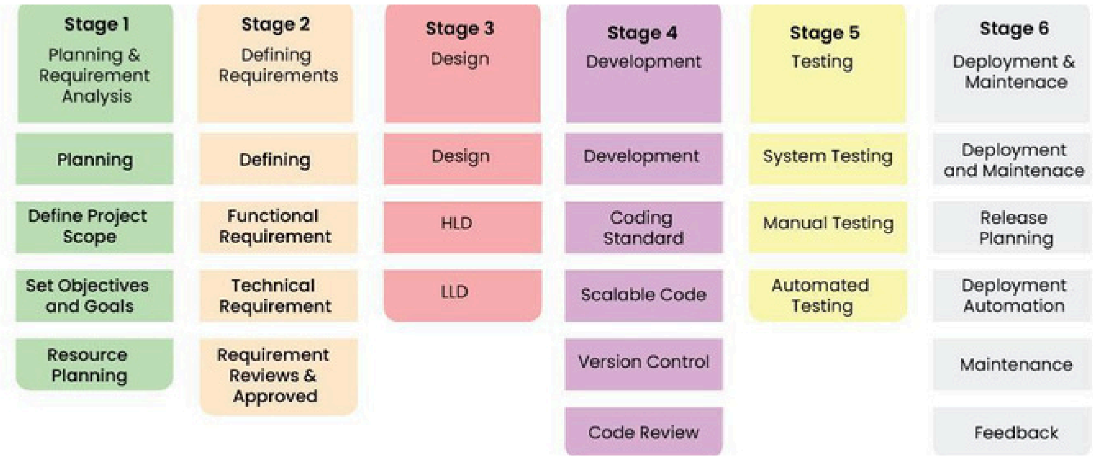
What is the Software Development Life Cycle (SDLC)?

The Software Development Life Cycle (SDLC) is a structured process that software companies follow to create high-quality software.

It provides a clear plan for developing, maintaining, upgrading, and improving software efficiently.

By following SDLC, teams can ensure a smooth and organized development process while enhancing the overall quality and performance of the software.





Stage 1 Planning & Requirement Analysis	Stage 2 Defining Requirements	Stage 3 Design	Stage 4 Development	Stage 5 Testing	Stage 6 Deployment & Maintenace
Planning	Defining	Design	Development	System Testing	Deployment and Maintenace
Define Project Scope	Functional Requirement	HLD	Coding Standard	Manual Testing	Release Planning
Set Objectives and Goals	Technical Requirement	LLD	Scalable Code	Automated Testing	Deployment Automation
Resource Planning	Requirement Reviews & Approved		Version Control		Maintenance
			Code Review		Feedback

Stage-1: Planning and Requirement Analysis

Planning is a crucial step in everything, just as in software development. In this same stage, requirement analysis is also performed by the developers of the organization. This is attained from customer inputs, and sales department/market surveys.
The information from this analysis forms the building blocks of a basic project. The quality of the project is a result of planning. Thus, in this stage, the basic project is designed with all the available information.

Stage-2: Defining Requirements

In this stage, all the requirements for the target software are specified. These requirements get approval from customers, market analysts, and stakeholders. This is fulfilled by utilizing SRS (Software Requirement Specification). This is a sort of document that specifies all those things that need to be defined and created during the entire project cycle.

Stage-3: Designing Architecture

SRS is a reference for software designers to come up with the best architecture for the software. Hence, with the requirements defined in SRS, multiple designs for the product architecture are present in the Design Document Specification (DDS).
This DDS is assessed by market analysts and stakeholders. After evaluating all the possible factors, the most practical and logical design is chosen for development.

Stage-4: Developing Product

At this stage, the fundamental development of the product starts. For this, developers use a specific programming code as per the design in the DDS. Hence, it is important for the coders to follow the protocols set by the association. Conventional programming tools like compilers, interpreters, debuggers, etc. are also put into use at this stage. Some popular languages like C/C++, Python, Java, etc. are put into use as per the software regulations.

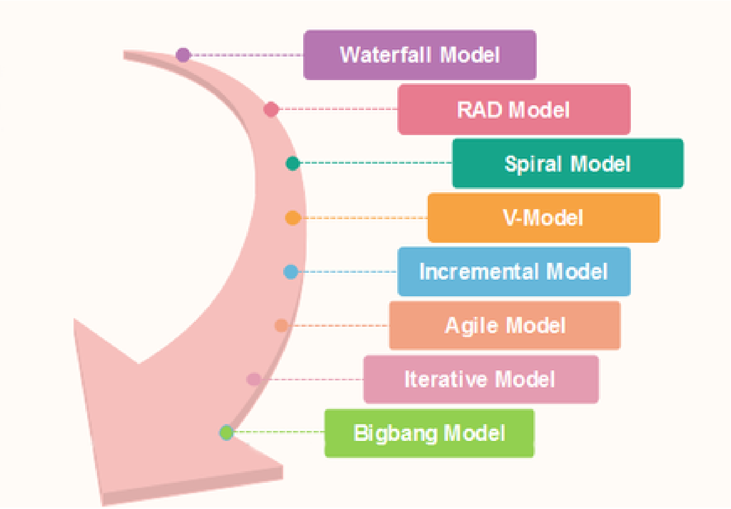
Stage-5: Product Testing and Integration

After the development of the product, testing of the software is necessary to ensure its smooth execution. Although, minimal testing is conducted at every stage of SDLC. Therefore, at this stage, all the probable flaws are tracked, fixed, and retested. This ensures that the product confronts the quality requirements of SRS.
Documentation, Training, and Support: Software documentation is an essential part of the software development life cycle. A well-written document acts as a tool and means to information repository necessary to know about software processes, functions, and maintenance. Documentation also provides information about how to use the product. Training in an attempt to improve the current or future employee performance by increasing an employee's ability to work through learning, usually by changing his attitude and developing his skills and understanding.

Stage-6: Deployment and Maintenance of Products

After detailed testing, the conclusive product is released in phases as per the organization's strategy. Then it is tested in a real industrial environment. It is important to ensure its smooth performance. If it performs well, the organization sends out the product as a whole. After retrieving beneficial feedback, the company releases it as it is or with auxiliary improvements to make it further helpful for the customers. However, this alone is not enough. Therefore, along with the deployment, the product's supervision.

Software Development Life Cycle Models:



1. Waterfall Model

It is the fundamental model of the software development life cycle. This is a very simple model. The waterfall model is not in practice anymore, but it is the basis for all other SDLC models. Because of its simple structure, the waterfall model is easier to use and provides a tangible output.

2. Agile Model

The agile model in SDLC was mainly designed to adapt to changing requests quickly. The main goal of the Agile model is to facilitate quick project completion. The agile model refers to a group of development processes.

3. Iterative Model

In the Iterative model in SDLC, each cycle results in a semi-developed but deployable version; with each cycle, some requirements are added to the software, and the final cycle results in the software with the complete requirement specification.

4. Spiral Model

The spiral model in SDLC is one of the most crucial SDLC models that provides support for risk handling. It has various spirals in its diagrammatic representation; the number of spirals depends upon the type of project. Each loop in the spiral structure indicates the Phases of the Spiral model.

5. V-Shaped Model

The V-shaped model in SDLC is executed in a sequential manner in V-shape. Each stage or phase of this model is integrated with a testing phase.

6. Big Bang Model

The Big Bang model in SDLC is a term used to describe an informal and unstructured approach to software development, where there is no specific planning, documentation, or well-defined phases.