**DevOps**

**What is DevOps :**

DevOps is a set of practices, tools, and cultural philosophies that integrate software development and IT operations. The goal of DevOps is to improve the quality of products and services by making the software development process more efficient.

**Responsibilities:**

1. Collaborate with Teams: Work closely with software developers and IT staff to ensure smooth and fast delivery of applications.
2. Monitor Systems: Keep an eye on system performance and fix any issues that arise to ensure everything runs smoothly.
3. Improve Processes: Continuously look for ways to make the software development and deployment processes more efficient.
4. Ensure Security: Implement practices to keep systems secure from potential threats.

**Why Use DevOps:**

DevOps helps businesses deliver **better software, faster** by:

1. Reducing Development Cycle Time – Faster releases with automation.
2. Increasing Deployment Frequency – Continuous Integration & Deployment (CI/CD).
3. Improving Reliability & Stability – Automated testing, monitoring, and rollback mechanisms.
4. Enhancing Collaboration – Developers & IT teams work together seamlessly.
5. Scaling Efficiently – Infrastructure as Code (IaC) allows rapid scaling.
6. Minimizing Human Errors – Automation eliminates manual intervention mistakes.

**How Does DevOps Work:**

1. Plan**:** Define features and tasks using tools like Jira or Trello.
2. Develop**:** Code is written using Git-based version control.
3. Build&Test**:** CI/CD tools automate code integration and testing.
4. Release&Deploy**:** Code is deployed automatically via CI/CD pipelines.
5. Monitor&Operate**:** Tools like Prometheus & Grafana monitor app performance.
6. Feedback&Improve**:** Logs and analytics help improve software continuously.

**DevOps Tools:**

1. Get, GitHub

2.Jenkins, GitLab CI/CD

3.Docker

4. Kubernetes

5.Terraform

**DevOps Lifecycle:**

DevOpslifecycle is the set of phases that include DevOps for taking part in Development and Operation group duties for quicker software program delivery. DevOps follows positive techniques that consist of code**,** building**,** testing**,** releasing**,** deploying**,** operating**,** displaying**,** andplanning**.**

**DevOps Lifecycle :**

1. Continuous Development
2. Continuous Integration
3. Continuous Testing
4. Continuous Deployment/Continuous Delivery
5. Continuous Monitoring
6. Continuous Feedback
7. Continuous Operations

**Conclusion:**

DevOps is a game-changer in software development and IT operations, enabling faster, more reliable, and efficient software delivery. By integrating development and operations, DevOps promotes automation, collaboration, and continuous improvement to enhance software quality and reduce deployment time.

**Manual Testing**

**Software Testing (Manual Testing):**

Software testing is the process of evaluating a software application to identify and fix defects, ensure it meets requirements, and verify its functionality, performance, security, and usability. It is a crucial step in the software development lifecycle (SDLC) that helps deliver a reliable, high-quality product.

What does software testing do

* Ensures the software meets quality, functionality, and performance standards
* Uncovers defects and issues in the software
* Helps ensure the software works as intended after changes are made

How is software testing done

* Testers run the software in controlled conditions
* Testers test the software across a range of scenarios, environments, and user interactions
* Testers look for defects that arise during the process

P**roject**: if software application is developed for specific customer based on the requirement then it is called project.

**Product:** if software application is developed for multiple customers based on market requirements then it called product

**Types of Software Testing:**

1. Manual Testing**:** Performed by humans without automation tools.

2. Automated Testing**:** Uses scripts and tools like Selenium, JUnit, or TestNG.

3. Functional Testing**:** Ensures features work as intended.

4. Performance Testing**:** Evaluates speed, responsiveness, and stability.

5. Security Testing**:** Identifies vulnerabilities and threats.

6. Usability Testing: Assesses user-friendliness.

7. Regression Testing**:** Confirms new updates don’t introduce errors.

**Software Quality:**

Quality: Quality is defined as justification of all the requirements of a customer in a product.

Quality software is reasonably

-Bug free.

-Delivered on time.

-Within budget.

-Meet requirements and /or expectation.

-Maintainable.

**Software Testing Life Cycle (SDLC):**

SDLC, Software Development Life Cycle is a Process Used by software industry is design develop and test software’s

1. Requirements Analysis
2. Design
3. Testing
4. Deployment
5. Maintenance

**Conclusion:**

With the aid of **software testing**, you will be capable of verifying each and every aspect of software testing.

For instance, with the aid of **software testing**, it is possible to monitor whether the software is compatible with your browser.

Thus, in case, you gain success in finding any error, you will be having the option for the rectification of the same.

Thus, you will be capable of saving from the complaints and you will gain a high prominence slowly but gradually

**SDLC Models:**

Software Development life cycle (SDLC) is a spiritual model used in project management that defines the stages include in an information system development project, from an initial feasibility study to the maintenance of the completed application.

* 1. Waterfall Models(Fixed requirements)
  2. Spiral Model(Risk Management required)
  3. V model validation & verification model( Fixed requirements)
  4. Agile Model (Changing requirements)

**WHY TESTING IS NECESSARY:**

Testing is necessary for software products to ensure they are reliable, secure, and perform well. Testing can also help reduce costs and improve customer satisfaction.

Customer satisfaction, security, cost reduction, performance, project risk reduction.

**Software bug :**

The Bug is the informal name of defects, which means that software or application is not working as per the requirement. a software bug can also be issue, error, fault, or failure. The bug occurred when developers made any mistake or error while developing the product.

The bugs are caused for many reasons but main one is Specification.

Specifications are the largest bug producer its constantly changing, or it’s not communicated well to the entire develop team.

**The Cost of Bugs:**

Bugs in software are not just annoying — they come with directandindirectcosts that can negatively affect a company's reputation, finances, and productivity. Understanding these costs is essential for businesses to mitigate the impact of bugs and make informed decisions about testing and quality assurance. They would have found the bug , but it would have been more expensive ton fix because the software would have to be debugged, fixed and retested.

**Software testing** - it is process to test an application to find out error in it.

Checking the software is ok. The goal of software tester

To find bug. Verifying and validating that a software or

Application is bug free.

Software testing is the process of evaluating and verifying that a software application or system performs as expected, is free of bugs, and meets the specified requirements. It is a critical part of software development to ensure that the software is reliable, secure, and functionally sound.

**Types of Software Testing :**

Manual Testing

Automation Testing

**Manual Testing** : Manual testing includes testing a software manually, without using any automated tool or any script. Human involvement to execute test cases without automation tools. Testers explore the application, identify bugs, and report them.

**Types of Manual Testing :**

1. **White Box Testing.**
2. **Black Box.**
3. **Gray Box Testing.**

**Automation Testing**: Automation testing, which is also known as Test Automation, is when the tester writes scripts and uses another software to test the product. This process involves automation of a manual process. Automation Testing is used to re-run the test scenarios that were performed manually, quickly, and repeatedly.