E-commerce website Automation testing

Objectives of testing:

Objective of this testing are multifaceted, encompassing the assurance of functionality, usability, security, and performance. It involves verifying that the website operates as intended, allowing users to perform crucial tasks like browsing products, adding them to cart, and making purchases without encountering errors. Usability testing ensures the site is intuitive, easy to navigate, and responsive across devices, ensuring a pleasant shopping experience. Security testing focuses on safeguarding sensitive user data, ensuring encryption, and safeguarding against potential cyber threats. Performance testing evaluates the website's speed, responsiveness, and scalability, ensuring it can handle varying user loads without slowdowns. Ultimately, the aim is to create a reliable, user-friendly, and secure online platform that meets user needs while fostering trust and confidence in the website's functionality and security.

Scope of testing :

The scope of testing for an e-commerce website spans across various dimensions crucial for ensuring its functionality, usability, and security. It involves examining all primary functionalities such as user registration, product search, cart management, checkout processes, and order management. Additionally, the scope extends to encompass testing across different devices and browsers to ascertain compatibility and responsiveness. Security aspects are thoroughly evaluated, including authentication mechanisms, data encryption, and protection against potential vulnerabilities. Performance testing delves into assessing the website's responsiveness under varying loads to ensure it performs optimally during peak usage. Moreover, the scope incorporates testing for compliance with industry regulations, user accessibility, error handling, and recovery mechanisms. Ultimately, the comprehensive scope aims to validate the website's reliability, security, and user-friendliness, fostering a seamless and trustworthy online shopping experience.

Testing levels :

- Unit Testing:
    - *Focuses on testing individual components or modules of the website, such as specific functionalities within the site's code (e.g., product search, user authentication) also includes (buttons, forms, or search bars) , ensuring each unit performs as intended.*
- Integration Testing:
    - *Verifies interactions and data flow between different modules or systems within the e-commerce platform. This testing level ensures that integrated components work together smoothly, such as checking how the cart*

interacts with the payment gateway or how user authentication integrates with the database.

- System Testing:
    - *Evaluates the overall functionality and behavior of the entire e-commerce website as a system. It involves end-to-end testing of scenarios like user registration, product browsing, cart management, checkout process, and order management to ensure the website meets specified requirements.*
- Acceptance Testing:
    - *Involves validating the e-commerce website from a user's perspective. It ensures that the website meets business objectives and user expectations. User acceptance testing may involve real users performing tasks and assessing the site's usability, functionality, and overall satisfaction.*

<u>Testing types:</u>

- Functional Testing:
    - *Checks if all the essential functions work as intended, including user registration, product search, adding items to the cart, checkout processes, and order management.*
- Usability Testing:
    - *Evaluates the website's ease of use, ensuring users can easily navigate, search for products, and complete purchases without confusion.*
- Performance Testing:
    - *Ensures the website functions well under different conditions, including handling peak traffic, loading speed, responsiveness, and stability during high user loads (like holiday seasons or sales events).*
- Security Testing:
    - *Focuses on safeguarding user data, ensuring secure transactions, and protecting against potential threats such as data breaches, ensuring encryption, and secure payment gateways.*
- Compatibility Testing:
    - *Validates that the website works seamlessly across various devices (desktops, mobiles, tablets) and different web browsers to provide a consistent experience for all users.*
- Regression Testing:
    - *Verifies that new updates or changes to the website haven't introduced issues in existing functionalities, ensuring that previous features still work after updates or modifications.*

- User Acceptance Testing (UAT):
    - *Involves real users testing the website to confirm it meets their needs, expectations, and business requirements, ensuring it's user-friendly and aligns with user preferences.*
- Accessibility Testing:
    - *Checks if the website is accessible to all users, including those with disabilities, complying with accessibility standards to provide an inclusive experience.*

Entry and exit criteria :

Unit Testing:

- *Entry Criteria*: *Availability of individual components or units of the website's code for testing.*
- *Exit Criteria*: *Successful completion of unit tests for each component, ensuring they meet defined specifications and don't have critical defects.*

Integration Testing:

- *Entry Criteria*: *Completed unit testing, availability of integrated modules, and predefined integration test cases.*
- *Exit Criteria*: *Successful integration of modules, verification of data flow between components, and resolution of critical integration issues.*

System Testing:

- *Entry Criteria*: *Completion of integration testing, availability of the entire system for testing, and documented system test cases.*
- *Exit Criteria*: *Validation of the website's functionalities, performance, and adherence to defined requirements. Resolution of high-priority defects.*

Acceptance Testing:

- *Entry Criteria*: *Successful completion of system testing, availability of the system for user acceptance, and defined acceptance criteria.*
- *Exit Criteria*: *Approval by stakeholders or end-users, confirmation that the website meets business objectives, and resolution of critical user-reported issues.*

Test environment and tools:

Environment:

Hardware and Infrastructure:

- Servers:
    - *Provisioning servers to host the website, databases, and necessary network configurations.*

- Load Balancers:
    - *Managing traffic distribution to ensure website stability under varying loads.*
- Virtualization or Cloud Services:
    - *Utilizing cloud platforms (like AWS, Azure) for scalability and flexibility in testing.*

Software Configuration:

- Operating Systems:
    - *Ensuring compatibility across various operating systems (Windows, Linux, macOS) used by customers.*
- Browsers:
    - *Installing different browsers (Chrome, Firefox, Safari) for cross-browser testing.*
- Database Systems:
    - *Setting up databases (MySQL) for testing data integrity and transaction handling.*

Isolated Test Environment:

- Separation from Production:
    - *Keeping the test environment isolated from the live website to prevent disruptions.*

Test Data Preparation:

- Creating Test Data:
    - *Generating various datasets (products, user accounts, orders) to simulate real-world scenarios.*

Tools:

Automation Tools:

- Selenium WebDriver:
    - *Automating browser actions to test website functionalities across browsers and platforms.*
- Cypress:
    - *JavaScript-based testing tool for end-to-end testing and automation.*
- TestComplete:
    - *GUI-based testing tool for functional, regression, and UI testing.*

Performance Testing Tools:

- Apache JMeter: *Assessing the website's performance under load to ensure it handles traffic efficiently.*

- LoadNinja: *Cloud-based load testing tool for measuring web application performance and scalability.*

Test Management and Bug Tracking:

- JIRA, TestRail, Bugzilla: *Managing test cases, tracking bugs, and monitoring test progress.*

Cross-Browser and Device Testing:

- BrowserStack, LambdaTest: *Platforms providing cloud-based testing on various browsers and devices.*

API Testing Tools:

- Postman: *Testing APIs to ensure smooth communication between the website and other systems.*

Risk analysis :

Security Risks:

- Data Breaches: *Unauthorized access leading to theft of sensitive user data (personal information, payment details).*
- Fraudulent Activities: *Unauthorized transactions, identity theft, or fraudulent purchases.*
- Phishing Attacks: *Deceptive attempts to obtain sensitive information from users.*

Performance Risks:

- Downtime: *Unexpected website crashes or unavailability, leading to loss of sales and customer trust.*
- Slow Load Times: *Impacting user experience and potentially leading to abandoned carts or dissatisfaction.*

Technical Risks:

- Software Bugs: *Undetected errors or glitches affecting functionalities, checkout processes, or order management.*
- Compatibility Issues: *Incompatibility with specific browsers, devices, or operating systems.*

Regulatory and Compliance Risks:

- Non-Compliance: *Failing to adhere to industry standards (PCI-DSS, GDPR), leading to legal implications and fines.*

User Experience Risks:

- Poor Usability: *Complicated navigation, confusing layouts, or difficult checkout processes causing user frustration.*