| **Team member** | **Test project** |
| --- | --- |
| Dương Trường Bình | DuongTruongBinh |
| Nguyễn Tuấn Thanh | NguyenTuanThanh |
| Trần Đức Hoàng | TranDucHoang |
| Nguyễn Thị Phương Trinh | NguyenThiPhuongTrinh |
| Phạm Văn Minh | PhamVanMinh |

**Why and when do we use test automation?**

**Phạm Văn Minh:**

Why do we use test automation:

* High reliability: Automated testing tools have higher stability compared to humans, especially when dealing with numerous test cases, making them more reliable than manual testing.
* Repetitive capability: Automated testing tools were developed to alleviate testers from repetitive tasks (e.g., data input, clicking, result verification), reducing monotony while maintaining high reliability and stability.
* Reusability: With an automated testing suite, it can be used for various versions of applications, demonstrating reusability.
* Fast: Being executed by machines, automated testing is significantly faster than human testing. If it takes 5 minutes to manually execute a test case, it might only take around 30 seconds for automated testing.
* Cost-effectiveness: When applied correctly, automated testing can lead to substantial cost and time savings, as well as reduced manpower requirements. Automated testing is much faster than manual testing, and the personnel needed for script execution and maintenance are minimal.

When do we use test automation:

* When the test cases can be done automatically
* When the test cases need testing several times (such as high-risk cases or safety-critical components)
* When the testing cost can be reduced
* When the quality of the software needs to be improved
* When the tests need to run in parallel on multiple devices and operating systems
* When we need to perform regression testing

**Dương Trường Bình**

Why we test automation:

* Manual testing is time and cost-consuming
* Automation testing shortens tests and project duration
* Difficult to do manual testing in some situations
  + Multi-lingual sites
  + Performance test
  + Security test
* Automation helps increase test coverage
* Manual testing can become tedious and error-prone

Benefits of Test Automation:

* Save time and costs: Automated tests are faster and reduce manual effort, resulting in higher ROI.
* Ensure reliability: Automated tests produce consistent and accurate results, reducing human errors.
* Achieve broader test coverage: Automation can test more scenarios, improving software quality.
* Enable frequent testing: Frequent automated testing catches issues early, reducing development time.

When Test Automation Works Best?

* Test automation works best for some testing
  + High-risk, business-critical test cases
  + Test cases that are executed repeatedly: such as regression test
  + Test cases that are very tedious or difficult to perform
  + manually
  + Time-consuming test cases
  + Performance tests
  + Load tests
  + Security tests
* Generally, Regression testing: Testing functionality that has been tested before in earlier iterations

**Trần Đức Hoàng**

Why do we use test automation:

* Efficiency: Automated tests can be executed much faster than manual tests, it is particularly valuable when need to run the same tests repeatedly
* Repeatability: Automated tests provide consistent and repeatable results. They are not influenced by human factors like fatigue or oversight, which can affect manual testing
* Coverage: Automation allows to cover a wide range of test scenarios, including those that are time-consuming or complex to perform manually
* Speed: Automation can quickly execute tests across different browsers, operating systems, and device configurations
* Load and Performance Testing: Automated tools can simulate a large number of users or transactions, helping identify performance bottlenecks and scalability issues
* Early Detection of Defects: Automated tests can be integrated into the continuous integration and continuous deployment (CI/CD) pipeline, helping detect and fix defects early in the development process

When do we use test automation:

* Test automation is most effective when applied to stable and well-understood features of the application
* Automated tests are ideal for regression testing to ensure that existing functionality remains intact after code changes
* Use automation when we need to repeatedly execute the same test cases, especially across different environments or configurations
* Automated tests are valuable for handling complex scenarios that are challenging to replicate manually
* For projects with a long lifespan or where tests need to be executed over an extended period, automation can save time and effort

**Nguyễn Tuấn Thanh**

Test automation is used in software development and testing processes for several key reasons:

* Efficiency: Test automation significantly reduces the time required to execute repetitive test cases, allowing for faster testing cycles.
* Accuracy: Automated tests perform the same actions consistently, eliminating the potential for human error in manual testing.
* Reusability: Test scripts can be reused across different versions of the software, reducing the effort required for regression testing.
* Consistency: Automated tests provide consistent test coverage, ensuring that all test cases are executed in the same manner every time.
* Parallel Testing: Automation allows running multiple tests concurrently, accelerating testing processes and providing quicker feedback.
* Continuous Integration/Continuous Deployment (CI/CD): Automation integrates seamlessly with CI/CD pipelines, enabling automated testing at various stages of software development, ensuring quality at each step.
* Regression Testing: Automated tests are valuable for quickly verifying that new changes have not introduced defects into existing functionality.
* Load and Performance Testing: Automation is essential for simulating a large number of users and stress-testing applications to identify performance bottlenecks.
* Data-Driven Testing: Automation can easily handle variations in test data, making it suitable for testing various scenarios.
* Cost Savings: Over time, automation can reduce testing costs by decreasing the reliance on manual testers.

When to use test automation depends on various factors:

* Stability: Automate tests when the application or feature under test is relatively stable to avoid frequent script updates.
* Repetitiveness: Automate tests that need to be executed frequently, such as regression tests, smoke tests, and routine checks.
* Complexity: Automate tests that are too complex or time-consuming for manual execution.
* Regression Testing: Automate tests that need to be run frequently to ensure that existing functionality still works after code changes.
* High Risk: Automate tests for critical areas prone to defects or areas with a history of issues.
* Frequent Changes: Avoid automation for parts of the application that undergo frequent changes, as maintaining automation scripts for such areas can be time-consuming.

**Nguyễn Thị Phương Trinh**

Why do we use test automation?

* Efficiency: Test automation speeds up testing processes, saving time and resources.
* Consistency: Automated tests ensure uniform and repeatable testing conditions.
* Accuracy: Automation reduces the risk of human error in testing.
* Regression Testing: It's crucial for quickly verifying software changes.
* Complex Scenarios: Automation handles intricate test scenarios effectively.

When do we use test automation?

* Repetitive Tests: Automate tests that are performed frequently.
* Regression Testing: Use automation for quickly retesting software after changes.
* Large-Scale Testing: For extensive test suites that are impractical to run manually.
* Load and Performance Testing: Automation helps simulate heavy user loads.
* Complex Scenarios: When test cases involve numerous variables or scenarios