

Best Practices in Multi-Device Testing for Retail Applications



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Best Practices in Multi-Device Testing for Retail Applications

Retail Applications – The Business Game changer

Before the intervention of Retail applications the term Retailer referred to a physical point of sale, where customers would have to visit to buy products. The options available to customers were very limited, and there wasn't much of a satisfied customer experience.

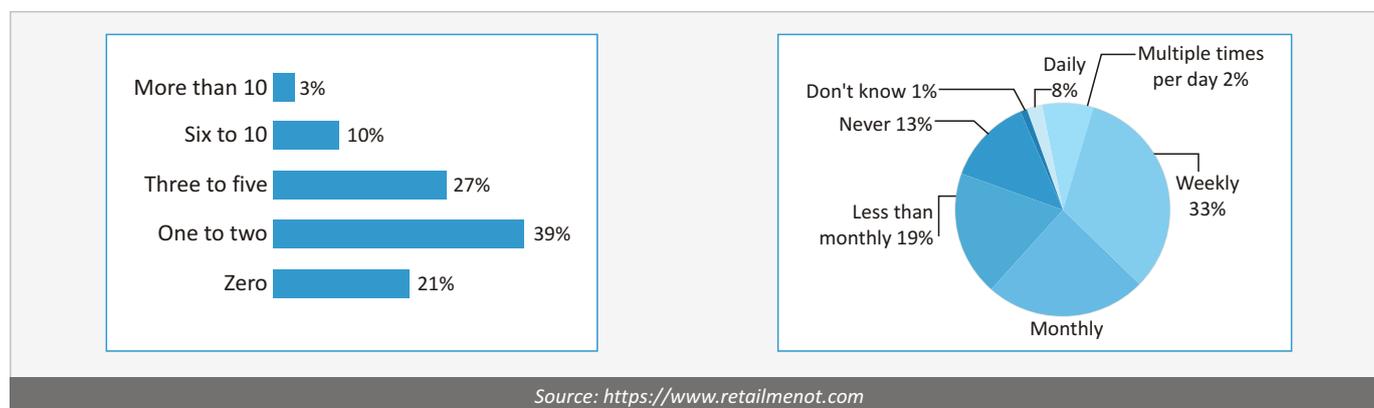
"The secret of successful retailing is to give your customers what they want. And really, if you think about it from the point of view of the customer, you want everything: a wide assortment of good quality merchandise; the lowest possible prices; guaranteed satisfaction with what you buy; friendly, knowledgeable service; convenient hours; free parking; a pleasant shopping experience." - Sam Walton, Founder of Wal-Mart Corporation.

A successful business is the one with the most consumer reach and there isn't any other way to get a global coverage in the era of technology and networking than applications. To gain more market share and profit any retailer would require a brand name and a massive customer base. To gain this in the physical world, retailers should have massive investments for advertising, setting-up retail outlets and staffing. The same requirements are easily delivered beyond expectations by retail applications without the need for a number of retail outlets and with least possible human resources. Considering the fact that outlets & staffing are two most expensive costs for retail, applications gave retailers, the ultimate breakthrough in bringing down investments. With proper marketing and promotions there is no better way to add value to a brand, than retail applications.

The beginning of retail applications was huge individual applications with specific functionalities like - warehouse management systems, pricing, etc. These systems were interconnected through point-to-point interfaces. Such a non-elastic infrastructure configuration constrains retailers from responding rapidly in a dynamic, digital-physical environment. At this point, only a very few online retailers offered web applications for consumers.

However this situation changed rapidly. Consumers were widely attracted to retail applications due to round the clock availability, endless options and it does not compromise the comfort of being at home while shopping. Realizing the potential, all retailers started coming up with retail applications to stay in business. Today not even a single successful retailer exists without retail application.

The below chart represents the number of retail applications that consumers have on their mobile devices.



The unmatched success of smart phones has opened numerous new possibilities in retail applications. Since the amount of time spent on mobile devices by consumers is phenomenal, Mobile Retail applications are the core battlefield for Retail business. The below chart shows the frequency of retail app usage based on a recent survey.

Once consumers have retail applications installed in their device the probability of using the application at least once in a week is considerably higher, this is the equivalent of gaining a regular customer in retail terms.

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Testing Retail applications

Retail applications are one of the most complex applications that are used by a huge customer base. Retail applications usually have the following sections and functionalities



Members Area

This is where account creation, login, adding payment methods, setting preferences and personal details like address are done.



Products Area

This is where the products to be sold and offers are displayed and categorized. This also enables the user to search and find the required product.



Payment

Payment comes as a subset of Members Area, which handles customer payments.

Today's Retail applications are either a Website, Mobile site or Mobile Native app. Retail applications started off as just Websites, due to popularity and usage time gained by mobile and the evolution of wireless networking Mobile Sites and native apps are now the preferred choice of customers. As a result it's now available in a wide range of devices and browsers.

All popular retail applications in the market today are being used across multiple platforms. The percentage of the platform being used varies based on the trend and user base of the platform. However all platforms that have a reasonable number of users must be considered for testing.

Most of the issues related to multi-platform testing occurs for the below reasons in different sections of retail applications.



Members Area

Most issues occur related to navigation between pages and related to login session tokens



Products Area

Most issues in the members section are display and animation issues. Retail applications are rich in display effects and animations to be more presentable and attract customers with better user experience. However these animations and effects don't work the same way across different platforms.



Payment

Payment issues relating to multi-platform are relatively less compared to Members and Products area. However issues are expected around navigating to and from third party payment provider sites. Different platforms/ browsers don't process these requests alike.

Apart from the above, Retail applications are frequently updated with new features and changes in technologies to offer more to customers and stay on the business edge. This has raised the requirement of frequent releases with lower time frames.

Both the above mentioned requirements are repetitive and time consuming to be done manually and hence automation takes over.

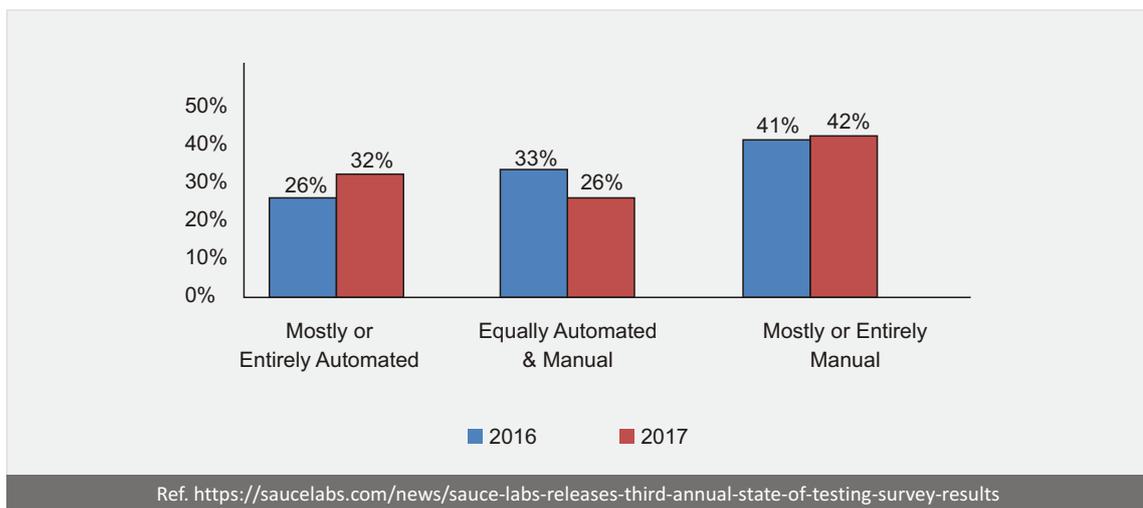
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Role of Test Automation

Regression testing is the key part of every release from a QA perspective that ensures the quality of the product is unaffected due to the release. Regression testing typically covers all the basic functionality of the Retail application that is being released. Regression tests do not require to be modified very often and they are required to be executed quite frequently in very strict time frames. These two requirements are the key requirements for automation and this is where automation fulfills the purpose of executing huge number of test cases with accuracy within a short burst of time. Due to the above mentioned reasons almost every Retail application provider, have automated regression test cases.

By default any tests that are once automated will save time & resources on every execution there on in. However not every test case is automated. The limitation of what has to be automated is only affected by two parameters. So if the test case under consideration is not expected to change frequently, then the only deciding factor is it can be automated and if so, how much effort does it require. In the earlier ages of automation, there were automation tasks that tools were unable to do. But now due to the evolution of automation tools and the experience gained all these actions are now made possible. Also, it is now realized that a Test Automation solution can make use of multiple tools and frameworks to deliver an efficient and promising solution.

A recent independent survey “Testing Trends in 2017: A Survey of Software Professionals.” was conducted by Dimensional Research regarding the place of automation in Test Automation. The summary of the result was an astonishing 6% increase in automation test coverage under the mostly or entirely automated category.



We have reached great milestones in test automation where almost anything that we need automated, can be automated. And the future will make the task even easier due to the evolution of Test Automation tools & frameworks.

Best practices & considerations for Multi-platform Test Automation

Test automation is the answer to multi-platform testing with reasonable coverage and time. But providing an efficient automation solution and getting the maximum ROI (Return of Investment) requires some consideration to how testing is automated. Below are the most important considerations and best practices to effectively test retail applications across multiple platforms.

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1. Locators and actions

Consideration

All automation tools are based on these core three abilities execute test cases automatically.

- ➔ **Element Identification** – It is the ability of an automation tool to identify a unique control like a button or a text box in an app
- ➔ **Reading Properties of an Element** – Ability to read the various properties of an element like Button. These properties include colour, element status – enabled/disabled, XY position in the screen, etc.
- ➔ **Performing Action** – Ability of the tool to act on an element like clicking a button or entering data in a text field

The consideration here is that different platforms and browsers expose the elements differently. The below are the real examples where we have faced such scenarios.

Scenario 1

There was a list of options for a combo box in retail web app. Element identification for the items in the list, worked fine in chrome, but the same code does not work when executed on IE11.

Scenario 2

Right-clicking on an element in a retail web app, worked fine on all browsers (like Chrome, IE & Firefox) when executed in Windows Operating system. But the same failed to work on Safari on Mac OS platform.

Best Practice

In both the above scenarios, automation team had to revisit all such occurrences and make code changes to make the solution work across different platforms.

The best practice would be, taking this into consideration at the time of test script development to ensure the locators or the actions used are compatible across most possible platforms. This is because in the scenarios mentioned above, the initial requirement of the client (Retailer) was to only test their web application in Chrome & Firefox, who later realized the importance of multi-platform testing and wanted the automation solution to incorporate it. So it is always crucial to ensure the compatibility of the code across multiple platforms, even if it is not a current requirement.

2. Framework selection

Consideration

Test automation framework plays an important role in how effective the automation solution is. In reference to Multi-platform testing, the following should be considered at the time of Framework design.

- ➔ **Execution Trigger** – Test automation framework is responsible for how executions can be triggered. This is crucial in multi-platform testing, as there should be an easy way to run test cases on different platforms.

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Best Practice

Selecting the right type of framework is not the only best practice to be followed here. Pre-defined Automation framework types are not entitled to perfectly suit any automation solution; rather they are just guidelines that address most common requirements. So it is advisable to tweak and make changes or additions to existing framework types in- order to suit the solution.

The way test executions are triggered in automation should make it easy for changing the target platform on which the test has to be executed. In case of Selenium solutions using Test NG framework, it is as easy as changing a parameter in XML file. This would make multi-platform executions seamless.

3. Tool Selection

The first task to be done, once a decision has been made for automation is tool selection. Selecting the right tool can make automation easier and encourage a good ROI in a shorter period of time.

Considerations

- ➡ **Multi-platform & Browser support** – Most commercial automation tools have no or very minimal support for multiple Operating Systems as they are platform based. Even the most popular paid tools only support limited versions of the commonly used browsers. This leaves a huge gap in device / browser coverage for testing, which is very crucial for testing Web & mobile apps.

Moreover paid tools only focus on Windows operations system, leaving out Mac OS & Linux Operating systems that take considerable amount of customer base for web apps.

- ➡ **Parallel Execution** – This is not a mandatory requirement, but it is essential for efficiency. Parallel execution makes a massive difference in the time taken for testing. Especially when test cases have to be executed across multiple platforms, it is not always the case to have enough time for serial execution.

Best Practice

When selecting an Automation tool, it is crucial to ensure the tools support test execution across a wide range of Platforms. This should not be just checked with the current popular platforms, a history of how fast the tool was updated to support the new platforms and technologies over the years, should also be taken into account. Therefore selecting an automation tool that has the wide range of supported platforms will be the first step in Multi-platform testing.

Parallel execution, though not considered as a mandatory requirement, is very important to efficiency and turn-around time for testing. Even in this parameter Open Source tools have an upper hand, by supporting Parallel multi-threaded executions that can run on different platforms at the same time.

4. Test Coverage across Multiple-platforms

Consideration

There are scenarios where the same test cases have to be executed multiple times using different Test data. If these cases are required to be tested across multiple platforms, it leads to execution of a very large number of test cases (Number of Test Data * Number of platforms)

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Best Practice

When there is a requirement where test cases have to be repeated with different test data, it is advisable to run each test data on different platforms, so that both different test data & platforms are covered in every execution.

Present & Beyond

The simple fact to understand here is that, more the platform is to be supported more the testing is needed. Apart from Web app, where there has not been a massive change in the number of platforms, the rise of smartphones has brought in a vast number of platforms & devices to be tested on for retail applications, and automation tools & frameworks are still in the process of supporting the majority of them.

Even before the tools & frameworks have caught-up, Wearables VR and other technologies have started making its way into the Retail Market. This means the list of platforms to test an application will keep growing and automation tools & frameworks will continue improvisation and innovation to meet this ever evolving challenge.

Conclusion

Architecture is driven mostly by business needs. Digital age FinTech companies are in a position to take advantage of many modern architectural approaches and practices as described above which will accelerate their business and propel them towards the top of their field. At Aspire, we are happy to work with FinTech companies right from the ideation stage and walk along with you in the journey of your product.



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