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# Selection Of Test Automation Tools for BFSI Sector Web Based Applications

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**Statement of the Problem:**

BFSI is the banking, finance and insurance sector. Manual testing is time consuming and tedious process for testing the BFSI sector web based applications. With increase in demand of customer & tight delivery deadlines its challenging to test the BFSI web applications using manual testing approach. Testing team has to adopt the automation testing approach. For testing BFSI web applications there are many different tools available in market. These tools are mainly categorised into two categories that is open source and vendor specific. Selecting the right automation tool out of many tools available in market is first step towards automation testing.

In this research paper researcher has discussed on latest automation tools for web application testing, steps for selecting right automation tools and best practices for selection of automation tools for BFSI sector web application testing projects.

**Keywords-**BFSI, Automation tool, Web application.

## Introduction:

Test automation is in demand for BFSI web based applications. Automation tool is software which helps testing team for test execution, verification and reporting. Process of selecting right automation tool is very important. If test manager selects right automation tool then it would prevent loss of time, money, efforts and overall quality of automation testing. Also it's important to study current trends of market on test automation tools.

### Current trends of market on test automation tools:

Functional testing and Non-functional testing are main types of testing performed on BFSI sector web based applications.

### Categories of functional test automation tools for BFSI sector web application

As per the current software industry market and researcher experience in IT industry below are suggested functional testing tools

| Vendor Specific | Open Source |
|---|---|
| UFT | Selenium |
| Tricentis Tosca | Katalon Studio |
| TestComplete | Sahi |
| Worksoft Certify | Sikuli |
| Ranorex | Open Test |
| Telerik test studio | Watir |
| QA Wizard Pro | Cucumber |
| Rapise | |

**Categories of non-functional test automation tools for BFSI sector web application testing**

As per the current software industry market and researcher experience in IT industry below are suggested non-functional testing tools

| Vendor Specific | Open Source |
|---|---|
| LoadRunner | JMeter |
| LoadSter | Locust |
| Load Complete | Gatling |
| Loadstorm | |
| Neoload | |

**Review of Literature:**

In order to analyze the earlier research studies related to selection of test automation tools is achieved with the help of various sources like IEEE digital library, ebscohost business library, shodhganga thesis and various other journals, workshops etc. Review is done with around 100 international journal papers from the last 18 years.i. e 2020 to year 2002. From the review of related literature researcher can infer that the study conducted so far in automation tools for the web application testing have covered comparative study of few automation tools for web application testing. Earlier research studies have suggested the future area of research would be study on automation testing tools and frameworks.

**Need of the study:**

According to a study conducted by the US NIST, software producers lose 21.2 billion dollars annually because of inadequate testing. This certainly tells one important thing to researcher is the customers are seeing the real benefits of test automation tools. A study conducted by Wipro a leading global company has found 85% jump in test automation across industries to keep pace with evolving technology landscape. This study conducted is published in the year 2017 Business wire. The demand and use of test automation tools in BFSI sector web applications testing is also increasing due to companies are investing high money on automation testing tools. The current study is useful for decision support system for managers for selection of automation tools for web application testing in BFSI sector. Also the researcher study will helpful for new testers for doing systematic testing.

**Objectives of the study**

1.To study the process for selection of test automation tools for web application testing in BFSI sector.

2.To identify the best practices that organizations need to consider while selecting the automation tool for BFSI web application testing.

**Hypothesis of the study**

1.The selection of automation testing tool in BFSI business unit would dependent on type of the project and required budget.

2.Most of the organizations are using vendor specific automation tools for BFSI business unit.

**Research Methodology**

The relevant data for the study collected from both the primary & secondary sources. The primary data were collected through field survey by using structured questionnaire, personal interviews with managers and testing teams, discussions & mails.

**Sample selection**

The required sample is collected by using simple random sampling.

The researcher has selected 100 respondents from his organization. Two categories of respondent's researcher have selected. The first category of respondents as Manager and second category of respondents as automation testers. The manger is involved for taking the decision for selection of tools and the automation tester is actual user of the automation tool once tool get selected. So researcher selected two categories of respondents.

**Source of Data**

The primary data were collected through field survey by using structured questionnaire, personal interviews with managers and testing teams, discussions & mails. The secondary data is collected by reviewing 100 international journal papers from the last 18 years mostly from IEEE,3 PHD thesis from Shodhganga and few news on ebscohost business library.

**Period of the study**

Researcher has conducted the current case study in his organization for the period of 6 months. Researcher suggestions are implemented in the automation testing projects in his organization.

**Tools used in this study**

Researcher has used power BI, Ms-Excel and SPSS tool for data collection and analysis. Also researcher has done the study of various open source and vendor specific automation tools for the study as mentioned in this research paper.

**Data Analysis (IMPIRICAL STUDY):**

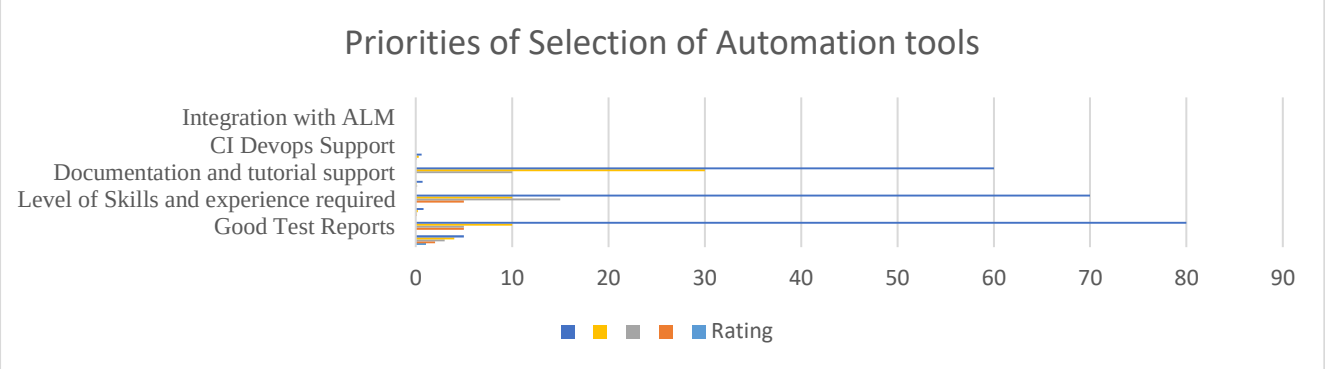
| Sr. No. | Priorities of selection of Automation tools | Rating | | | | | Mean Score |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | |
| 1 | Good Test Reports | 0 | 5 | 5 | 10 | 80 | 4.6 |
| | | 0.00% | 10.00% | 10.00% | 20.00% | 80.00% | |
| 2 | Level of Skills and experience required | 0 | 5 | 15 | 10 | 70 | 4.5 |
| | | 0.00% | 5.00% | 15.00% | 10.00% | 70.00% | |
| 3 | Documentation and tutorial support | 0 | 0 | 10 | 30 | 60 | 4.5 |
| | | 0.00% | 0.00% | 10.00% | 30.00% | 60.00% | |
| 4 | CI Devops Support | 0 | 10 | 5 | 15 | 70 | 4.4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 0.00% | 10.00% | 5.00% | 15.00% | 70.00% | |
| 5 | Integration with ALM | 0 | 10 | 15 | 10 | 65 | 4.3 |
| | | 0.00% | 10.00% | 15.00% | 15.00% | 65.00% | |

Table No.1.1

Table showing priorities of selection of Automation tool

Source: Survey Data (Rating 1-lowest,5-higest)



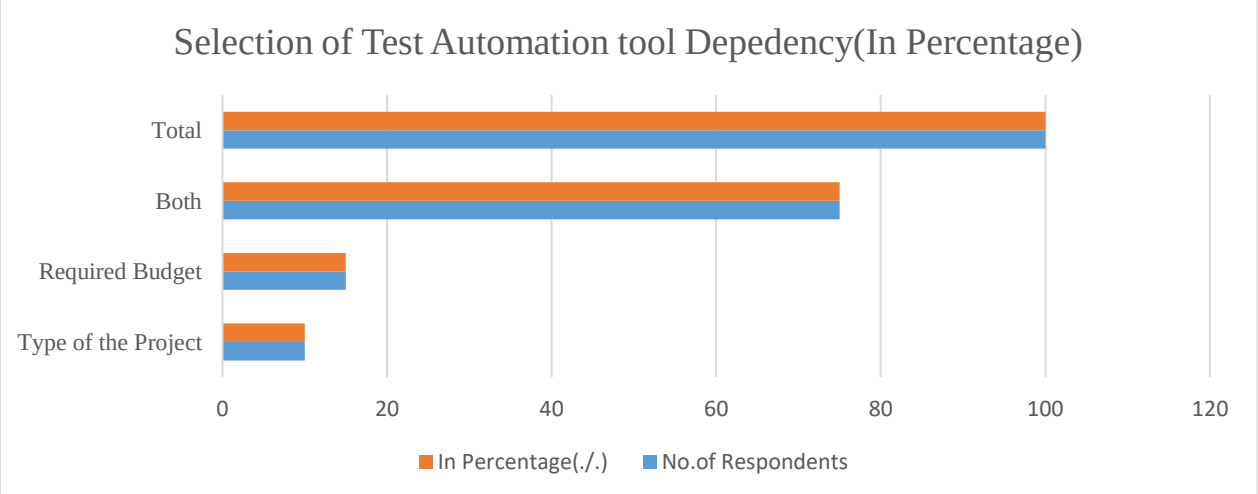

Graph No-1.1

Table No.1.2

Table showing criteria for selection of Automation tool

| **Selection of automation testing tool in BFSI business unit would dependent on which factor** | **No.of Respondents** | **In Percentage(%)** |
|---|---|---|
| Type of the Project | 10 | 10 |
| Required Budget | 15 | 15 |
| Both | 75 | 75 |
| Total | 100 | 100 |

Source: Survey Data




Graph No-1.2

Table No.1.2 revels that Majority of 75% respondent's opinion were Selection of test automation tools in BFSI business Unit would dependent on both the factors i.e. required budget and type of the project. Only 10% respondent's opinion were selection of test automation tools in BFSI business Unit would dependent on type of the project. So, it has been concluded that, Majority of 75% respondents agree with selection of test automation tools in BFSI business unit would dependent on both the factors i.e. Required Budget and type of the project.

Table No.1.3

Table showing Usage of Automation Tools

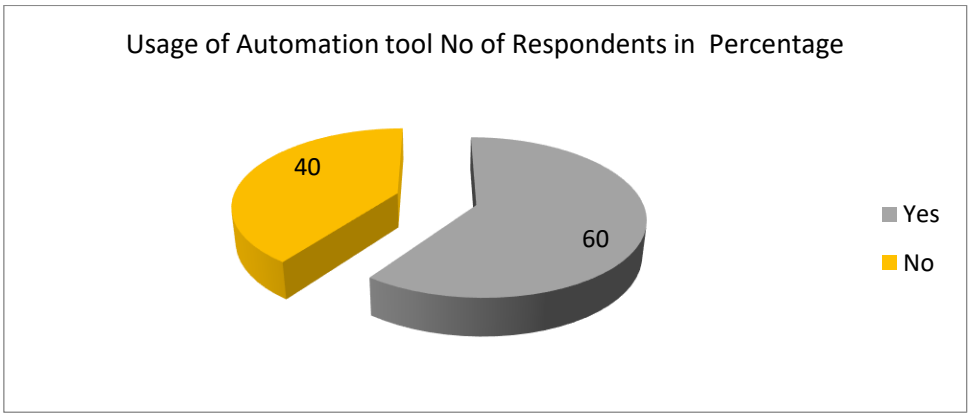
| Usage of Automation Tool | Type of Automation Tool | | Total |
|---|---|---|---|
| | Open Source | Vendor Specific | |
| Yes | 36 | 24 | 60 |
| | (36.00%) | (24.00%) | (60.00%) |
| No | 14 | 26 | 40 |
| | (14.00%) | (26.00%) | (40.00%) |
| Total | 50 | 50 | 100 |
| Percentage | (50.00%) | (50.00%) | (100.00%) |

Source: Survey Data

Table No.1.3 revels that usage of automation tool. From table No.1.3, 60% respondents were using automation tool for testing web applications. Out of that 36% respondents were using Open Source automation tool for testing web application & 24% respondents are using vendor specific automation tool for testing web application. 40 % respondents are not using automation tool for testing web application. So from Table No.4.1, it has been concluded that majority of 60% respondents are using automation tool for testing web application whereas only 40% respondent's organization are not using automation tool for testing web application.

**Graph No 1.3**

Graph showing Usage of Automation Tools



**Selection of Automation tools:**

Selection of test automation tool plays major role in success of test automation. Researcher had conducted survey of 100 respondents who was having 10+ years' automation testing experience in his organization. As per the survey conducted the top prioriories for selection of automation tools selected by respondents are shown in table 1.1 and Graph 1.1

**Good Test Reports**:

While selecting automation tool it's important that the tool should have support for good reporting. At basic level of test case execution report tester is checking test case is passed or failed. The most of the automation tools support this basic need. The automation testing team in industry needs much more than only basic report. They need informative and meaningful test reports. The test reports to help and analyse test effectiveness, test coverage and other analysis. Informative reports are always necessary for managers to make decisions about the quality of the project. 80% respondents agreed on good test report is highest priority while selecting the tool are shown in table 1.1 and Graph 1.1

**Level of Skills and experience required**:

When we decide to choose the automation tool for any project it's important to see the level of skills and expertise the testing team is having on tool. Selenium is a popular test automation framework but it requires testing team to possess a high level of technical skills and experience to get started. 70% respondents agreed on level of skills and experience required is highest priority while selecting the tool are shown in table 1.1 and Graph 1.1

**Documentation and tutorial support:**

Before selecting automation tool for the project test manager has to do the study whether the tool is having enough documentation and tutorial support. If tool is having good support for documentation and tutorial it would be easy for testing team to work on project as enough help on tool is available 60% respondents agreed on good documentation support is highest priority while selecting the tool are shown in table 1.1 and Graph 1.1

**CI Devops Support:**

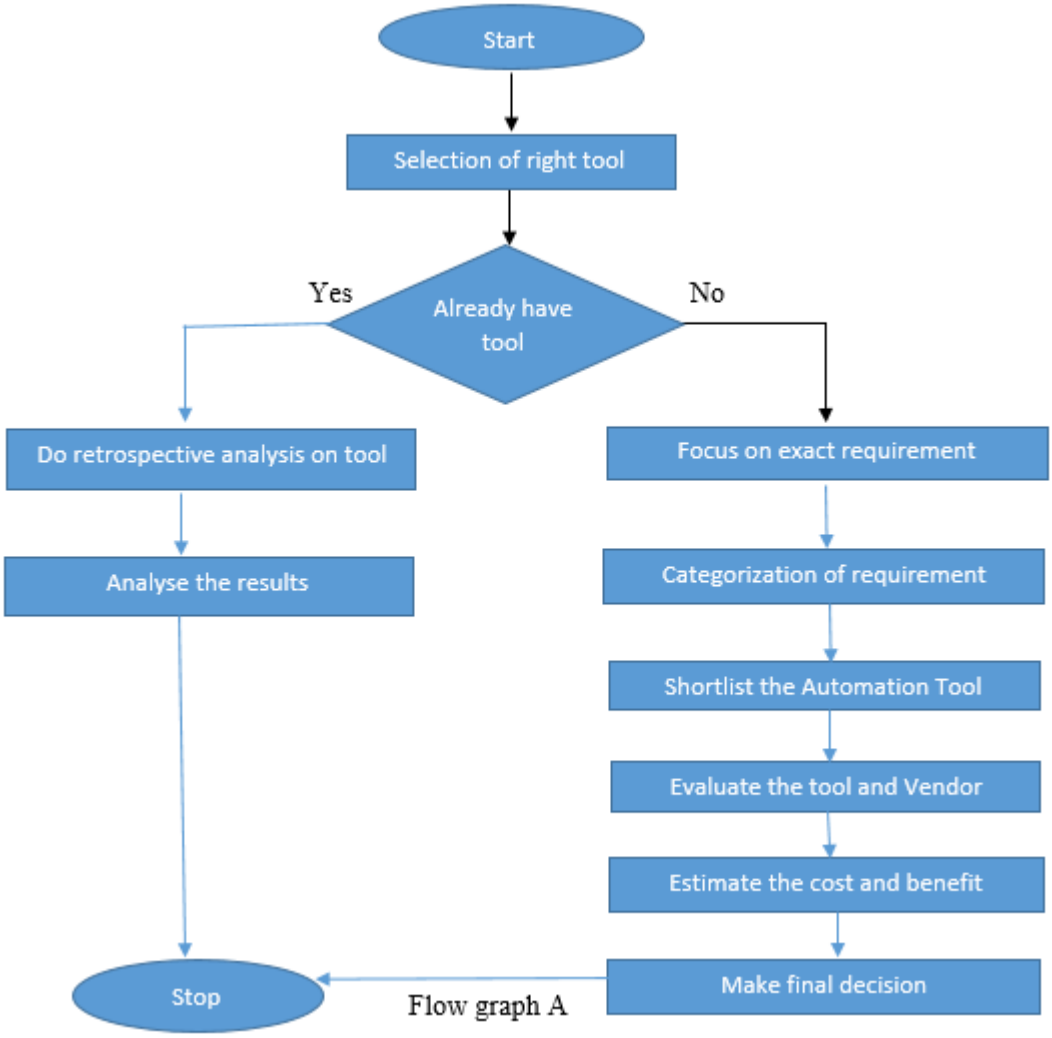
The selected automation tool should have continuous integration and devops support. As testing teams are working across locations geographically, the work done by the team need to be continuously integrated together. 70% respondents agreed on CI devops support is highest priority while selection of test automation tool are shown in table 1.1 and Graph 1.1

**Integration with ALM:**

Integration of functional testing tool with ALM is necessary to have effective testing. The results of automation scrips which are executed would be saved back to ALM. 65% respondents agreed on integration of ALM is highest priority while selecting the tool are shown in table 1.1 and Graph 1.1

**Flow graph for selection of test tools**:

As per researcher experience and opinion in test automation by using below flow graph 'A' is the effective way for selection of test automation tools.




In order to identify the right automation testing tool in effective way researcher has suggested above flow graph. First step towards the selection of tool is check the organization is already having a tool in place. If yes, then do the retrospective analysis of current tool. Analyse the results of retrospective study. If the organization is not having the testing tool, then first focus on exact requirements. Study and analyse the exact requirements. After the analysis of requirements testing team can categorise the requirements into different categories. As per the categorise of requirement shortlist the automation tool by doing the comparative study of different features of tool. Evaluate the tool as well as vendor support. Once the evaluation of tool and vendor is done then estimate the cost and benefits of tool for the current project. Finally, analyse the result and take the decision on selection of automation tool.

**Best practices for selection automation tool:**

Test automation tool selection is most important task before starting automation of any project. The selection of tool will affect the entire automation efforts. If the tool is good and giving you required features, then the automation becomes easier and effective. Below are the important best practices to select the automation tool for web application projects as per the researcher experience.

- Ensure testing team study the requirements and type of application thoroughly before choosing the tool

- Have a list of current market tools available handy with categories as open source and vendor specific as suggested by researcher in the current paper.
- Select the appropriate tool and do the dry run or pilot study on similar kind of application. It would act as proof of concept on selected tool
- Use PUBH matrix for selection of automation tools.
- Ensure that your testing team is having enough technical skills on selected tools.
- Verify that selected automation tool supports the Operating System and browser on which your application runs.
- Ensure that tool would support different kind of data sources.
- Verify the reporting features of the tool and ensure it shows good graphical reports.
- Verify selected tool can easily integrate to bug tracking tool in order to raise the defects.
- In order to do performance testing, ensure that performance testing tool supports creation of maximum virtual users.
- Using selected automation tool ensure testing framework can be built easily and effectively.
- Verify that enough help and articles are available on selected tool.
- Verify selected tool is easily integrated with third party tools.
- In order to evaluate the tool, verify tool provides you free trial version.
- It would be good if selected tool supports more coding languages.
- Ensure that automation tool supports maximum testing types like regression testing, performance testing etc.
- Ensure that tool is powerful enough to automate complex requirements.
- Ensure that tool should have easy features like record and playback with ability to edit recorded scripts.
- It would be really good for doing automation if tool is supporting various data files such as excel, Xml, text files etc.
- Cross verify the existing customer reviews who has already used the same tool.
- Ask vendor to have facility to provide free initial training on tool
- Ensure selected tool have vendor refund policy.
- Use flow graph A suggested for researcher while taking the decision on selecting the right automation tool
- If Customer is having automation tool, then testing team has to use same automation tool.

**Findings:**

1. Selection of test automation tools in BFSI business unit would dependent on required budget and
   type of the project
2. Majority of the respondents are using automation tools for testing the BFSI business unit web applications.
3. Majority of respondents selected good test report as most important priority of selection of test automation tool.

**Suggestions:**

1. Testing team should consider best practices for selection of automation tool suggested by researcher while selecting the automation tool for BFSI sector web applications.
2. Researcher has recommended the flow graph to test Managers for effectively selecting the test automation tools for BFSI sector web application.

**Conclusion:**

In current research paper researcher had put light on most important step towards automation as selection of right automation tool. Right automation tool selection plays a major role in successful automation. Researcher has suggested flow graph for choosing right automation tool, Categories and tools available for automation as per latest market. Finally, researcher has suggested best practices for selection of automation tool.

**Limitation of the Study:**

The current study of researcher is very helpful for Managers and testers for selection of right automation testing tools for BFSI sector web based applications. The study is limited to researcher organization with limited number of respondents**.**

**Scope for further research**

Smiler kind of study researcher can perform with population from different IT company's respondents. The scope of further research also to design and implement new automation testing framework for BFSI sector web based applications**.**

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