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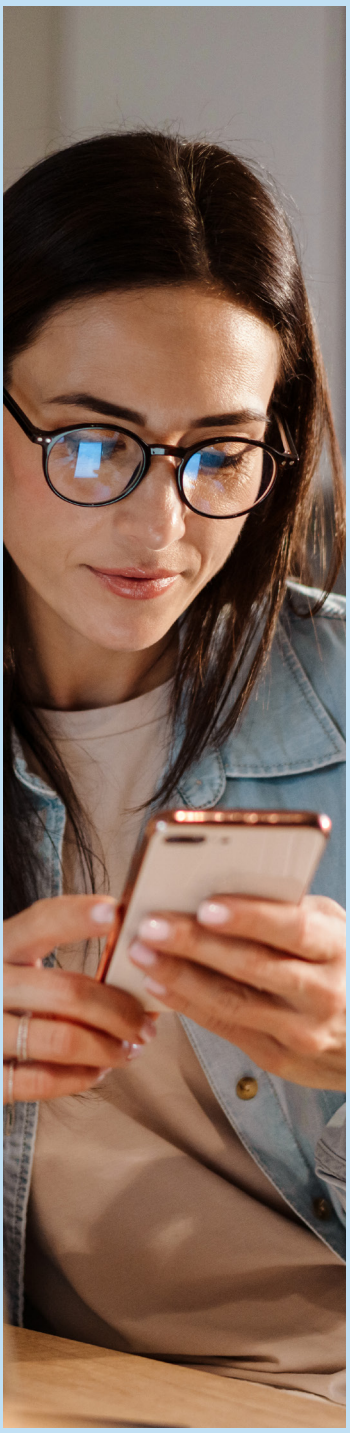

THE EMERGENCE OF LOW-CODE, NO-CODE (LCNC) TESTING

Abstract

Gartner forecasts that by 2024, low-code adoption will be so widespread that 75% of the software solutions built around the world will be made with the help of such tools. Low-Code No-Code (LCNC) development is the creation of software using graphic user interface or minimal basic code, instead of large strings of code using traditional programming languages. Further, LCNC take away the overhead of creation environments and maintaining infrastructure, by virtue of them almost always being offered as a service.

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Introduction

Acumen Research and Consulting forecasts that global low-code development platform market size is valued at USD 16 Billion in 2021 and is projected to reach a market size of USD 159 billion by 2030. No-code apps are basically solutions like form-based data inputs, simple reporting dashboards and lightweight back-office automations to solve functional use cases. Low-code platforms approach app development from a software engineering perspective, which enables developers to take advantage of scalable application architecture and flexible deployments.

Creating custom integrations for third-party solutions or homegrown systems are not supported by the vendor in no-code development. Low-code platforms have the ability to extend platform capabilities with open APIs promoting reusability. No-Code platforms lean towards operational efficiency use cases; they don't possess the capability to focus on user experience. LCNC platforms also address innovative use cases with next generation technologies like AI, ML and blockchain. No-code development platforms are perceived as too simplistic to support complex use cases and low-code development platforms are considered too complex for non-professional developers to use.

Relevance of Testing in LCNC Applications Scenario

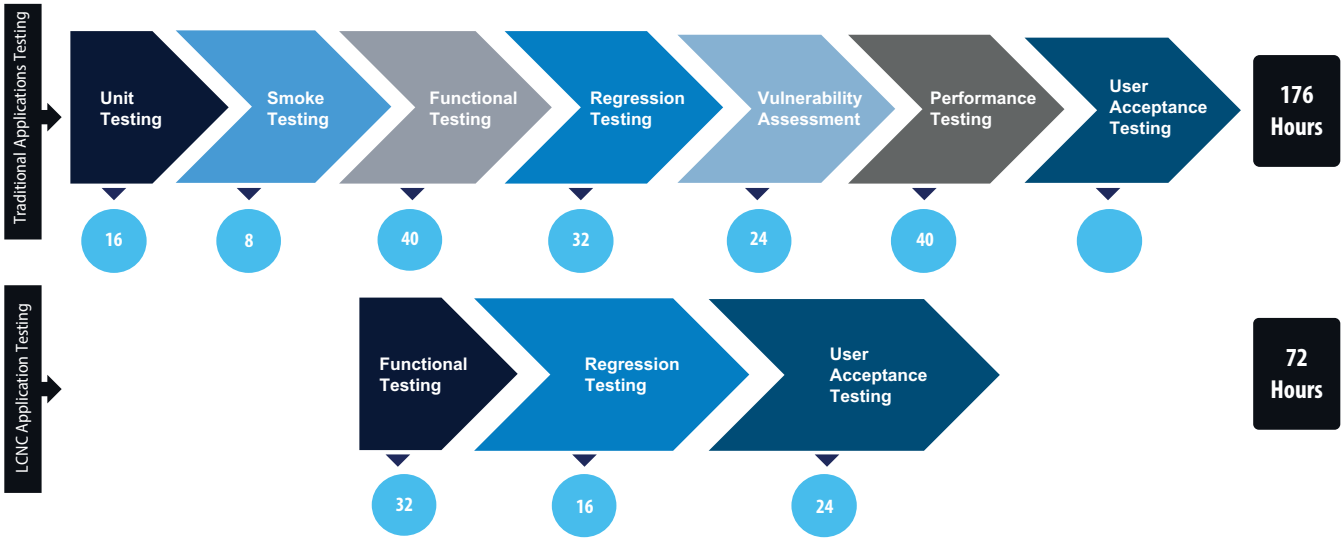
Software testing is often simplified (as a part of SDLC, the software development lifecycle), as a means to find defects and hence can be susceptible to be excluded from the SDLC in the LCNC application era. However, Software testing is a very crucial part of the SDLC for traditional application development and goes beyond just identifying defects and can add value by identifying shortcuts and/or new potential features that developers can easily create and add to the application.

- This will continue to remain the case even for the LCNC applications. However, there will be some changes that can be expected to the traditional STLC (software testing lifecycle).
- Testers will have to upskill themselves to be more functional, than being restricted to finding technical defects.
- With focus on early-to-market delivery in LCNC applications, the time available for testing will be rationalized.

Changes Expected in the STLC

We performed a study on the inhouse workflow tools that were built using traditional methodology and compared it to the newly introduced LCNC tools and found the following improvements with respect to effort and process.

- Unit Testing can be excluded from any Test plan for LCNC applications since these are applications that have been unit tested already.
- Vulnerability Assessment/Penetration Testing also can be excluded since these applications are tested for any Vulnerabilities during the development stage and reports are available for the same. There is no scope for introducing new code that can bring in vulnerabilities.
- Performance testing of LCNC applications will also be minimized, considering that the base application is already tested for higher loads and any implementation can take that as a baseline.



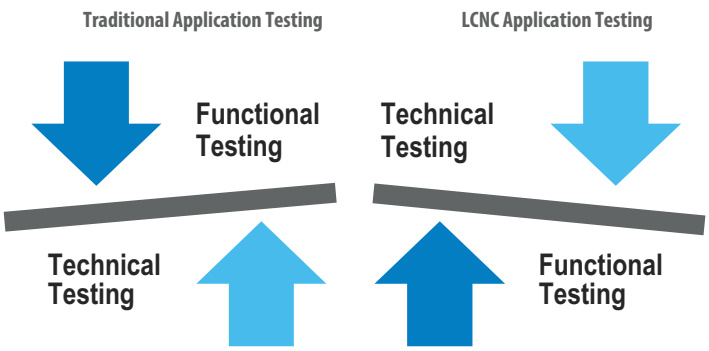
The effort was reduced from 176 hours to 72 hours which is a reduction of 59%

Changes Expected in the STLC

Following are the changes that we could see in the role of the tester while testing LCNC applications based on our study

- In the traditional STLC, a lot of focus is on identifying technical defects and a lot of time is spent on the same.
- Manual testers with their in-depth knowledge of the apps will be able to find quality defects and help improve the apps, especially considering that the future of LCNC apps will be citizen development and a democratized workforce.
- The role of the automation tester will reduce, with the introduction of LCNC tools to test applications. Like the democratization or citizen development, there will be a democratization in testing as well, with people having less to no knowledge in coding being able to create the test scripts.

Change observed in personas for Testing in Traditional Application Testing Vs LCNC applications



Leveraging LCNC Apps for Testing

- Manual testing can be avoided to a large extent, and one can only rely on an automation script; since application stability will always be high.
- With need for quicker go-to-market timelines, there is scope for LCNC apps/ bots that could be used to create test scripts, rather than the current code-based Automation testing tools.
- LCNC testing apps provide the option to quickly plan/create and execute end-to-end tests. These platforms allow the user to automate processes in the application, with little coding knowledge; unlike the traditional test automation frameworks.

We also performed an assessment of LCNC tools vs Traditional Testing tools for a standard LCNC application and we found that the effort reduction of almost 30% in creation/execution of Automated test scripts.

LCNC Vs. Traditional Automation Testing Tools Comparison (Remove LCNC platform)

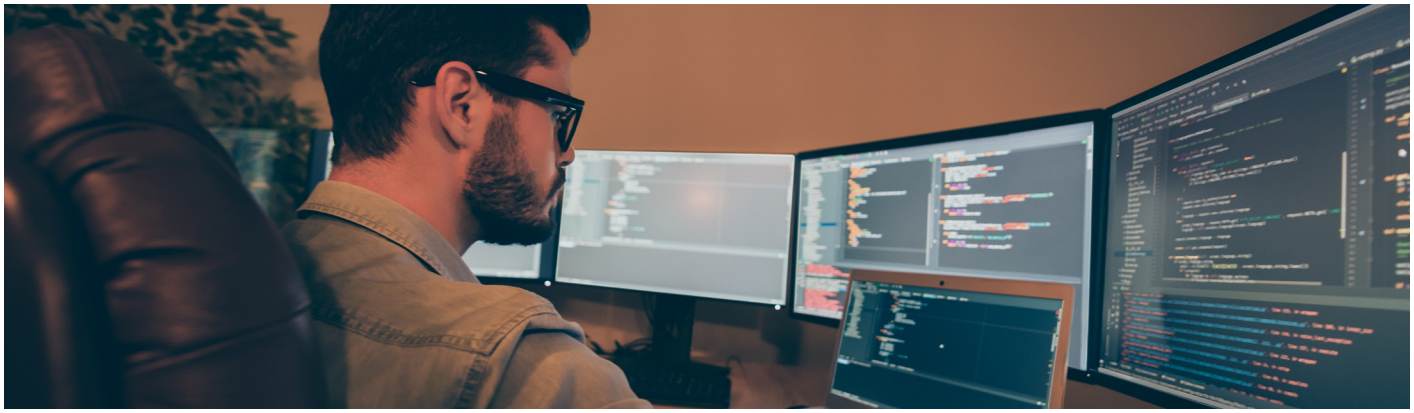
Stage	Parameter	Weightage	Comparison Score for Effort Reduction	
			LCNC Platform	Traditional Platform
			RPA	Selenium
Script Preparation	1. Identify Web Elements	10	9	6
	2. Identify Parametrization/ Test Data	10	8	6
	3. Creation of Test Cases / Test Suite	10	9	7
Script Execution	1. Execution Time	10	9	6
	2. Browser Compatibility	10	8	7
	3. Parallel Execution / Back End Execution	10	9	6
Report Generation	Automation Execution Reports	10	9	6
Test Coverage	1. Automatable Test cases coverage	10	9	6
Tool Usability	Performance of the Tool and Usability	10	9	6
Efforts Savings	Overall Project Testing Effort Hours saved	10	9	5
Average Score			**8.8**	**6.1**

*Ratings are awarded considering medium complexity accounts payable use cases having nearly 46 Test scenarios

Advantages of LCNC Tools for Test Automation

Here are the key advantages of using LCNC tools for test automation.

- Ease of use: LCNC tools have easy to use features to identify the controls and to create validations which eliminates the need to have a complex framework for test scripting.
- Low Maintenance: Since there are only commands involved and very little code, there is no need for maintenance
- Reduced Skill Levels: With the ease of test script preparation, skill level of resources required to create scripts reduces and makes it cost effective.
- Minimal Resource Allocation: Since the LCNC applications make it easy to create the scripts, time taken to create the test scripts is reduced to a large extent and testers can spend more time on exploring the application to identify defects.



Conclusion

While rumors of the death of software testing persist, they're greatly exaggerated, and testing is expected to become more important than ever. Our view on what is likely to happen is as follows.

- Some parts of the traditional STLC would become redundant like Vulnerability Assessment, Penetration Testing, Performance Testing Unit Testing.
- Testing efforts on LCNC applications has scope to be reduced by close to 60%.
- Testing efforts on LCNC applications that use LCNC tools for testing has scope to be reduced by a further 10-15% which makes overall reduction close to 75%
- Skill level required for a tester will change. To be relevant a tester would need to:
  - Enhance their domain skills to understand requirements and predict problems in production
  - Acquire skills to spot problems and proactively highlight risks in requirements.
  - Ability to point the unintended consequences of a Requirement/ Change Request.
  - Understand aspects of code like understanding the version control changes, ability to read production logs will play critical role in UAT, which is today primarily driven by the core development team.
  - Use new tools that will help reduce the time and effort needed for exhaustive testing.

Author

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Laxmi has over 25 years of extensive experience in IT system design and deployment at Infosys. Her current role involves – defining and establishing systems for support/maintenance and optimizing through a shared services model. Her focus is on cost reduction and productivity improvements across large deployments. Her work experience includes management of large IT teams, software engineering process enablement, program/project implementation to enable mergers of other IT systems to be seamless.

Arun Athrey

Arun has close to 15 years of experience in Software Testing in Infosys. His current role involves – Planning and Execution for all Testing activities including Manual Testing, Automation Testing, Performance Testing and Vulnerability Assessment across Web Applications and RPA. His focus is on increasing the quality for all applications delivered with optimized cost. His work experience includes management of large testing projects delivered across locations.

*For organisations on the digital transformation journey, agility is key in responding to a rapidly changing technology and business landscape. Now more than ever, it is crucial to deliver and exceed organisational expectations with a robust digital mindset backed by innovation. Enabling businesses to sense, learn, respond, and evolve like living organisms will be imperative for business excellence. A comprehensive yet modular suite of services is doing precisely that. Equipping organisations with intuitive decision-making automatically at scale, actionable insights based on real-time solutions, anytime/anywhere experience, and in-depth data visibility across functions leading to hyper-productivity, Live Enterprise is building connected organisations that are innovating collaboratively for the future.

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