POV

Are you Implementing End-to-end Testing?
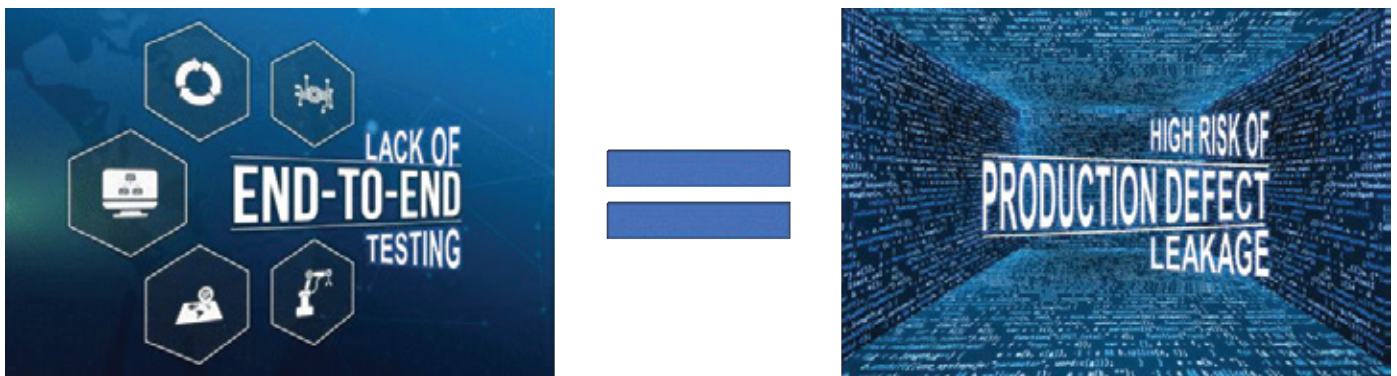
By Test Advisory Team

1 Imagine a large organization where there are modern digital technologies and applications, but also monolithic legacy systems that are core to the business. Integrating these systems is always a challenge.

In a typical case of M&A when product acquisition happens, there's an obvious challenge to consolidate the product lines, but once they are streamlined, another challenge appears in terms of integrating them to provide seamless business flow. **2**
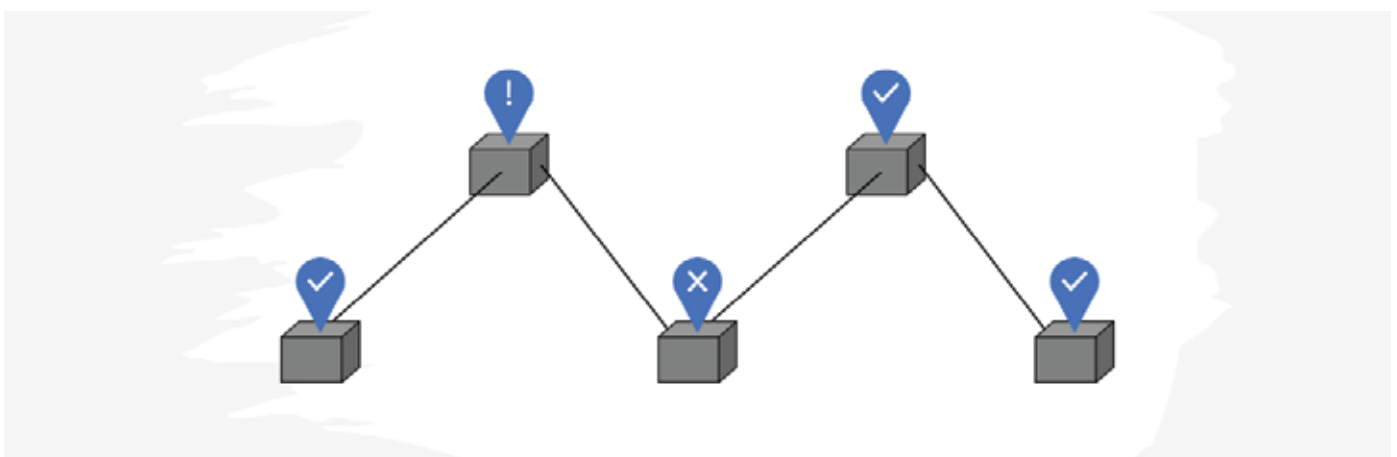
3 As companies are increasingly adopting Agile/DevOps model to improve their time-to-market and business value, they align their activities & workforce to the products, often missing out the big picture of end-to-end customer experience.

End to End (E2E) Testing is critical to ensure program/project quality, irrespective of the delivery model followed. Especially for large implementation programs, like digital transformation, cloud migration, supply chain transformation, Data and BI transformation etc., strategizing and executing end-to-end testing is crucial for the program's success. While component functional testing and functional integration can be done with the product/project team, delivering end-to-end testing as a cross functional /shared service has many advantages, including synergy, cross functional end-to-end coverage (upstream, downstream application), standardization, coverage, coordination, and program level visibility to the leadership and key stakeholders on comprehensive quality and most importantly, single ownership.

Typical issues faced are as below:

Common Issues	Quality	Speed	Cost	Typical current state
No RCA done on production issues from existing application / solution	Y		Y	No feedback loop to E2E test cases
Limited coverage for testing (only functional)	Y			Coverage is in pockets, lack of thought process to identify enterprise coverage
Lack of feedback from functional integration testing phase	Y	Y		Lack of prioritization & focus on problem prone areas
Traceability / mapping is missing, lack of review & sign off from business team on End to End flows	Y			Lack of clarity in determining and prioritizing mission & business critical flows
Duplication of effort		Y	Y	Many teams may do repeated tests in the name of E2E testing
Unavailability of test environments for third party applications due to lack of coordination & scheduling issues	Y	Y		Delay in End to End test completion, risk of reduced coverage
Longer cycle time due to manual execution, execution time		Y	Y	Lack of automation
Lack of collaboration between teams	Y	Y	Y	Lack of collaboration between systems and even between Manual & Automation teams
Lack of unified ownership and governance	Y	Y		Many projects and teams perform their own E2E testing
No centralized test repositories	Y	Y	Y	Teams use various repositories (excel, ALM, Jira, GitHub etc.), with duplicate test cases too
Lack of standardized E2E testing process	Y	Y	Y	Teams follow own protocol for execution and reporting

With a structured and centralized end-to-end testing setup, common issues can be addressed to ensure comprehensive testing quality at speed.

What does this entail, you may ask?

The critical elements of end-to-end testing are:

End-to-end test strategy	• Scope, coverage, execution plan, communication plan, governance & team • Defect triaging and ownership of defect management
End-to-end Business Process	• Determine business and mission-critical flows using application heat map • Impact analysis – Code or Process view to optimize flows for execution
End-to-end Test Cases	• Creation of E2E test cases based on identified business and mission-critical flows • Horizontal and vertical testing
Test Repository	• Centralized test repository for maintenance and execution • Standardized reporting from single source of truth
Test Environment	• Infrastructure and configuration checks to ensure there is no latency during load and systems do not have low performance • Interoperability with respect to hardware • Simulation of production environment

People	• Dedicated team to perform end-to-end testing as a service based on request from project / support teams
	• Skilled test associates with domain & compliance, application & automation knowledge for maintenance
Test Data	• Dataset that flows from start to end of business processes
	• Handover of data from distributed systems to mainframe batch and vice versa
Automation	• Automated business processes
	• Test automation of API/Webservices & batch jobs and vice versa

These elements come together to provide comprehensive coverage and increased quality of the product being delivered at speed. How we strategize these aspects is also critical for successful end-to-end testing.

- How the team is managed: Governance and metrics play a key role to ensure cadence, track and monitor improvements, collaborate, and orchestrate end-to-end test execution.

- Ensuring the right process: Where quality gates are in place to have the right checks and balance - creation of synergies so that the best practices can be leveraged with transparency and traceability for execution of business and mission-critical flows

- Focused ownership: Ensuring timely updates based on various feedback loops, driving automation, and enhancing service delivery, including when End to End testing is consumed and / or invoked for the various changes (project/program/defect fix/CR) are rolled out into production

End to End testing is focussed on better customer satisfaction

» **Overall improvement in quality of the product delivered through:**

- Increased Coverage – more cycles can be executed
- Feedback loop – Update test cases based on defects found
- Shift Testing Left
- Reduced defect leakage into production
- Improved performance

» **Faster time-to-market through:**

- Automation of key transactions in the End-to-End business flow (~45%)

» Cost savings through:

- Prevention of defects leakage into production

- Test automation (functional & data)

- Lean team

- Efficiency through accelerators

- Zero downtime

» Better customer satisfaction through:

- End-to-end testing with end user focus leading to satisfied customers due to better usability, functionality, and availability

About the Author

Meril Jacob K C

General Manager, LTIMindtree

meril.jacob@mindtree.com

Meril Jacob K C is the Global Head of GTM, Advisory & Solutions for Quality Engineering Services at LTIMindtree. He has extensive global QE experience in Delivery, Client relationship, Advisory, Portfolio management & Solutions.

- -