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Reimagining Quality
Assurance in an
Experiential Ecosystem:
**Moving Toward AI-led
Digital Assurance**

White Paper

Due to the fast-evolving nature of applications and agile delivery, the testing process today is highly complex. Software releases are not about barebones functionalities or basic enterprise integration. User experience and customer value are two key elements that must be incorporated into the testing stage of the application development chain. This requires specific models and patterns to guide test processes, factoring in the limitations of human testers.

The Evolution of Testing and the Need for AI/ML

With such an expansive ground to cover (load testing, performance testing, data-based integrations, third-party integration, UX testing, etc.) automation must go beyond regression tests, bringing in efficiency gains in various areas while reducing the need for human effort. A significant 44% of organizations are looking to automate over half of their testing efforts in the next 12 months as agile application delivery becomes the norm worldwide. Still central to the authoring and execution of automation scripts are humans, however, and with agile and DevOps models shrinking testing cycles, expectations start to outpace reality.

To address this, test automation must be reimagined as AI-led digital assurance, as it promises to offload much of the manual dependencies involved in testing. Specialists in artificial intelligence (AI), robotic process automation (RPA), and systems integration (SI) will prove to be strategic partners as enterprises pursue digital transformation centred on a robust and user-centric application landscape.

In this new era of testing, sophisticated AI and ML will take charge of quality assurance (QA) processes, as well as the larger "digital plus business" roadmap. Currently, 63% of organizations have a dedicated QA team, meaning more than 25% of organizations still divide testing responsibilities between QA and developers. It implies that a significant chunk of application development talent is routed to iterative tasks, without generating value.

AI and ML driven testing takes this process to an entirely new level, where machines are responsible for programming machines. Test cases are authored by AI techniques, automatically improving over time thanks to machine learning technology. In turn, enterprises will leapfrog into an experiential ecosystem where developers are repositioned as "guardians of UX" instead of continually having to shepherd the delivery process. AI will play a vital role, transforming the sheer speed, accuracy, and scale of testing activities.

It should be noted that the evolution of testing has not taken place in a vacuum. This evolution is a direct outcome (and driver of) the ongoing digital transformation that places the user or customer at the center of application design, development, and delivery framework. By 2025, the test automation market is expected to cross the US $100 billion threshold, as enterprises seek to partner with service providers and AI/ML specialists that can streamline testing scenarios.

How Digital Transformation has Triggered a Testing Revolution

Cross-industry digital transformation has turned the traditional approach to testing on its head. Not only is the organizational expectation from QA teams changing dramatically, but the end-user demand from software applications is also witnessing an upheaval. This has a trickle-down effect for QA processes, making the stakes incredibly high. The following digital transformation trends have been responsible for a new testing paradigm.

The average release cycle has come down from months to weeks
With digitization having penetrated every aspect of our personal and professional lives, software developers can no longer afford protracted release cycles. It is no surprise then that leading business-to-customer (B2C) services by Facebook and Google see multiple updates in a single month or even week.
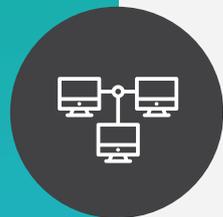
The number of connected devices is rapidly increasing
By the end of 2018, there were 22 billion connected devices in the world, and this figure is expected to grow further. As a result, applications must be compatible with multi-device usage, necessitating dedicated device testing services. Expectedly, the testing effort involved is exponential and near-impossible to achieve without the intervention of intelligent test automation.

Customer expectations are evolving at lightning speed
An estimated 77% of consumers expect applications to perform significantly faster than they did three years ago, and ten seconds is the upper threshold that consumers are willing to wait before switching to a different window. In this context, the pressure on QA teams is substantial. Without intelligent test automation, teams risk overlooking small but significant test cases, resulting in a diminished user and customer experience.

Let us now consider how AI can address these shifts and reposition enterprises as leaders in the new digital-first, experience-led environment.

Challenges that require immediate Intervention of AI and ML

Enterprises must leverage digital assurance to boost confidence in business capabilities, ensuring excellence at every touchpoint. In this regard, AI and ML address the below listed three critical areas.

The need to automate the entire application lifecycle

Application lifecycles are becoming more complex as customer and enterprise demands continue to escalate. Not only are applications expected to deliver superior experiences and robust functionalities, but they must also keep up with the dynamic nature of market requirements. As a result, the end-to-end application lifecycle—from ensuring compatibility with emerging platforms to testing for new network spectrums—must undergo an overhaul.

AI and ML can introduce scriptless automation that allows business stakeholders to get directly involved in the testing process, creating a more comprehensive digital assurance process. Further, automation across the entire lifecycle would make the testing ecosystem more efficient and generate better value for the enterprise.

Support for multiple data sources

Data quality assurance is a big part of testing effectiveness, ensuring that enterprise systems can gain from all types of data. However, as the number of connected devices continues to rise, and IoT becomes an enterprise staple, robust measures are required to cleanse and filter high-volume data streams. Further, it is vital to ensure the integrity of the data as well as anonymize identifiable information to maintain security and compliance. These are prime candidates for AI and ML applications, allowing these engines to learn from every data processing cycle to augment testing capabilities. This would become a self-correcting system over time.

The mission-critical nature of customer experience today

With the product landscape becoming increasingly competitive, customer experience is one differentiator that could set enterprises apart. This is why digital touchpoints must be capable of providing seamless experiences to both internal and external stakeholders, improving the "stickiness" of the application.

It is estimated that 62% of executives prioritize the delivery of personalized, transparent, and consistent customer experience across every interaction, something that is impossible to achieve without an experience-focused application delivery framework. AI and ML can help accomplish this by aiding GUI testing with visual recognition as well as freeing up human developers and testers to test the quality of experience.

Complex application lifecycles, an explosion in the number of data sources, and the criticality of customer experience are the top three reasons AI and ML are fast changing the testing paradigm. By leveraging these technologies, enterprises would be one step closer to building a digital assurance matrix that drives sustained performance across the digitization journey.

Key Use Cases for AI in Testing

The cognitive power of AI extends the boundaries of what we typically mean by "test automation." It is no longer just about automating regression tests and reducing the number of QA professionals required on a team. AI-led test automation goes far beyond efficiency gains to add value both in terms of application experience and enterprise impact. The promising use cases for AI include the below.

Critical test case identification
Identification of test cases and narrowing down to only those necessary can be a difficult task. ML algorithms not only compare different application versions and implementation environments to spit out possible test cases, but they also apply cognitive capabilities to assign a risk score to each case. This helps highlight case criticality and prioritize execution.

No-code test case authoring
Scriptless test cases are created using AI-based techniques. These can be executed on disparate technologies without any changes. In other words, "code once, run on multiple platforms." As long as the visual representation of an application is uniform across different platforms and technologies, test cases do not need to be authored with separate code. This dramatically reduces development effort, as well as drive down the effort and cost to maintain multiple code repositories.

The ability to predict defects
Enterprises no longer need to manually hunt for defects and address issues. AI helps perform more rigorous analysis, leveraging cognitive learning to predict areas that can result in errors. Further, AI/ML, and predictive analytics technologies make the testing ecosystem more proactive. Enterprises can move from reviewing results to forecasting mistakes, ultimately preventing defects altogether.

True self-healing nature
As the application is repeatedly altered to meet new business needs and user requests, the test suite is profoundly impacted. Multiple test scripts would inevitably become invalid. AI's self-healing capability auto-identifies and corrects test scripts based on the changes in the application or its architecture blueprint, thereby reducing the overall efforts needed for test script maintenance.

Reporting and decision-making
In a large-scale environment, creating required documentation and post-test cycles, and continually updating them, can take a great deal of time and effort. This becomes automated as a result of AI- and analytics-driven intelligent reporting. Further, the system also generates smart feedback after the completion of tests, guiding developers on how to improve customer experience and eliminate common problematic areas.

Unlock positive outcomes with Digital Assurance

The impact of AI-led testing automation is broader than apparent at first glance. As the world becomes increasingly more digitized and enterprises as a whole (not just standalone applications) witness repeated cycles of modernization, testing will become an ongoing process. This leads to the need for 360-degree digital assurance that cuts across horizontals and verticals to drive seamless transformation at every level.

AI/ML-led cognitive automation promises to be a revolutionary force for testing and QA stakeholders. By expanding the coverage of test cases, auto-executing cases without human intervention, predicting defects, and generating detailed reports on testing accuracy, AI and ML can dramatically increase human testing capabilities.

Such impact is realized in four areas. First, the sheer magnitude of manual effort required for clicks, data entry, and iterative coding is eliminated, shrinking QA costs. Next, developers and testing teams can now turn their attention to qualitative aspects of the software, ensuring applications are in-sync with the client, user, and customer requirements. This opens up the possibility of creative test cases that are culture- or domain-specific. A combination of machine efficiency and human creativity will prove to be a differentiator. Finally, human decision-making can be used to train AI testing bots, feeding schematized records of input and output for steady improvements.

Partnering for an Experience-led Business Modernization Roadmap

In the near future, AI and human executives will work together, maximizing the capabilities of each and unlocking measurable benefits for companies across sectors. By following AI and ML techniques in our digital assurance platform, we can help our customers eliminate severe defects, speed up go-to-market time, and increase productivity.

Given that testing takes up 15%-25% of overall development cost and effort for any application, Zensar is focused on optimizing this process and uncovering new pathways for value generation. Our digital assurance solution taps into the latest advancements in AI/ML - led automation to unlock real-world business value and help enterprises move from bottom-line efficiency to genuinely intelligent testing ecosystems.

For more information on Testing and Digital Assurance, please contact

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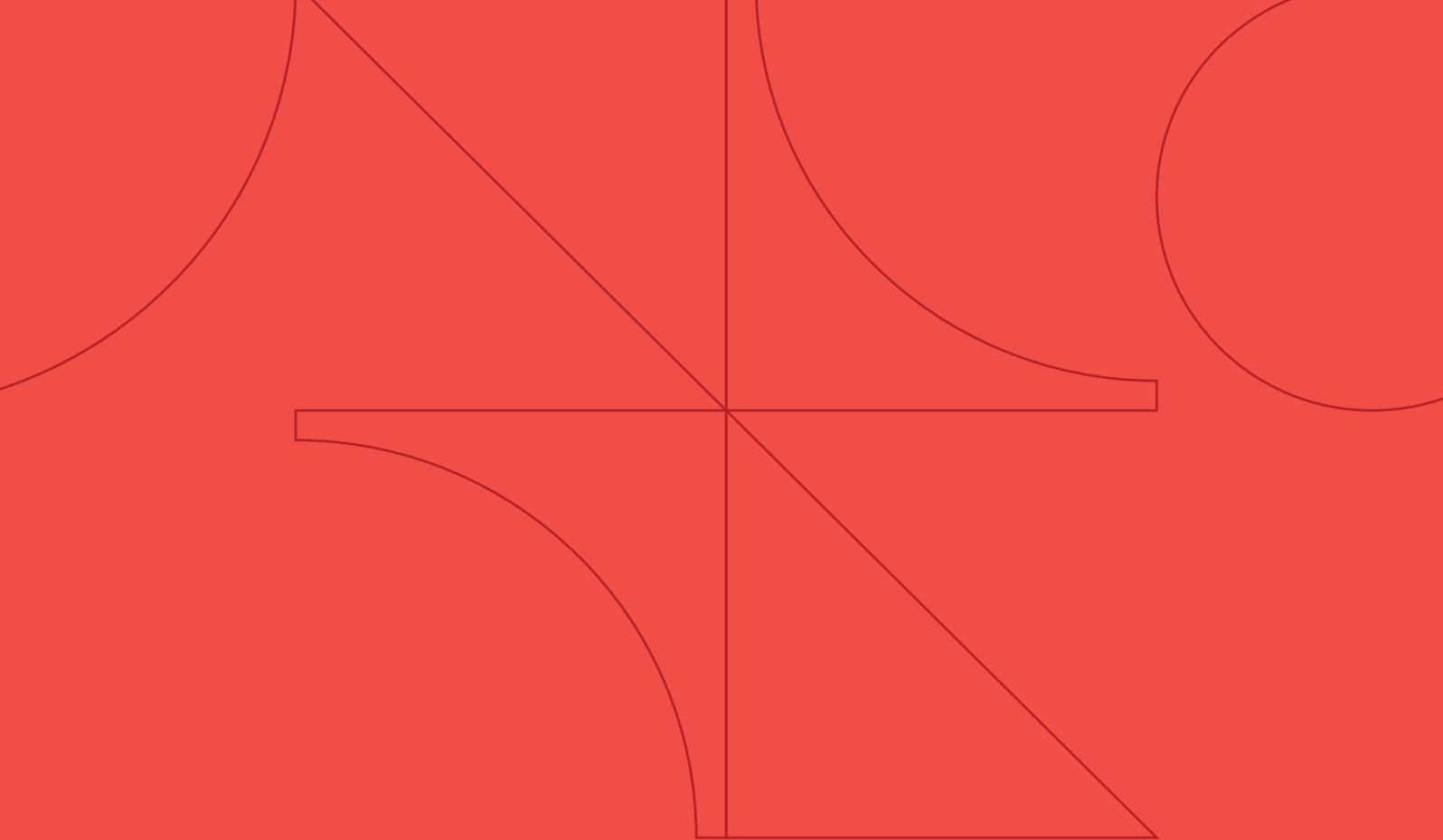
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