

Test Automation Guide for Healthcare Industry

Modernizing Healthcare Software Testing

Table of Contents

Digital Health Assurance	3	Test Automation Tools.....	7
Healthcare IT Market Global Forecast	3	Improve Patient Care with Test Automation.....	7
Medical Device Testing Market.....	4	Best Practices and Strategies for Test Automation Frameworks.....	8
Key Challenges of Adopting Test Automation	5	Customized and Risk-Free PoC	10
Developing Test Automation Framework	6	About Enhops, A ProArch Company	11

Digital Health Assurance

Healthcare organizations are increasingly adopting software solutions to improve patient care, reduce costs, and enhance operational efficiency. With increased regulations, focus on personalized healthcare, rise in research activities, and quest to deliver best patient care, **healthcare IT leaders are struggling.**

The healthcare IT landscape is exploding with new medical apps, health data and information management solutions. While this offers exciting possibilities, it creates a major challenge - ensuring comprehensive quality across applications.

Software teams struggle to perform enough testing to make sure that these tools are well-integrated and working as expected.

Healthcare IT Market

(Global Forecast to 2027)

The growth of the healthcare IT industry is driven by the growing adoption of Personalized medicines, telehealth, mobile health and other HCIT solutions.

“ The Global healthcare IT market in terms of revenue was estimated to be worth \$394.6 Bn in 2022 and is poised to reach \$974.5 Bn by 2027, growing at a CAGR of 19.8% from 2022 to 2027. ”

Source – [MarketsandMarkets](#).

Test automation helps with comprehensive testing for superior patient experience and allow product development teams to release more features without compromising on the quality.

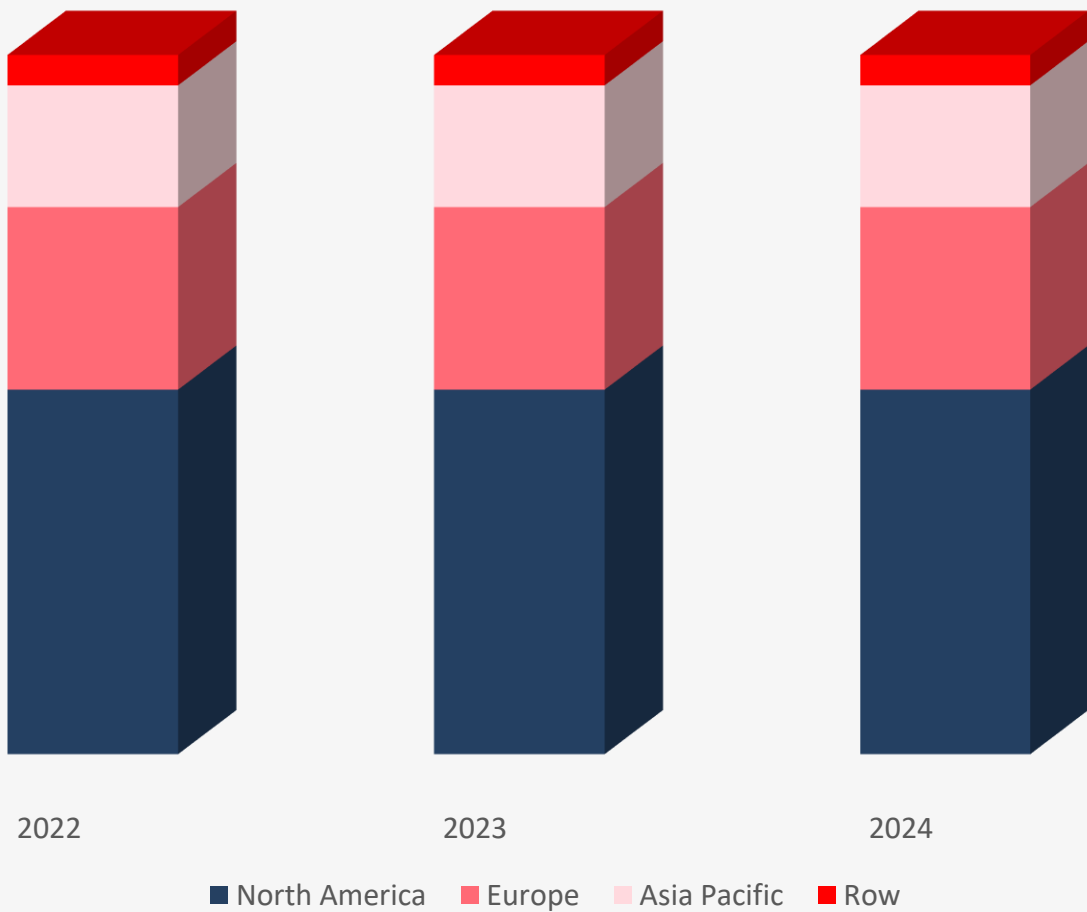
Medical Device Testing Market

Global Forecast to 2032 (USD BN)

CAGR OF
9.30%

According to a recent survey, the global medical device testing market size is expected to be valued at USD 9.29 Billion in 2023 to **USD 18.92 Billion by 2032.**

Source: [Market Research Future](#)



In this guide, we will discuss key challenges and benefits of adopting test automation in healthcare. It also provides tips for building an effective test automation strategy and framework.

Key Challenges of Adopting Test Automation

Reliance on manual and homegrown testing methods

Inconsistent and time-consuming methods. Lacks standardization, difficult to maintain, and inadequate testing coverage.

Lack of resources and talent

A shortage of skilled QA professionals with healthcare domain expertise.

Data privacy and security

Gaps in testing due to restricted or no access to real patient data. Stringent regulatory requirements like **HIPAA**, **GDPR**, and **PIPEDA**.

Interoperability testing

Integration of diverse systems and technologies require interoperable test suites.

Compliance requirements

Manual testing processes struggle to keep up with evolving compliance requirements leading to non-compliance issues.

At **Enhops**, we help healthcare organizations overcome all challenges to release high-quality and bug-free software for a perfect healthcare user experience.

[**Contact us**](#)

Developing Test Automation Framework for Healthcare Applications

Building a test automation framework for healthcare applications require lot of planning, assessment, and careful considerations of regulatory laws. Here's a step-by-step process on how to develop a test automation framework for healthcare applications –



1. Understand the Healthcare Domain

Gain a deep understanding of healthcare domain and how stringent regulatory standards affect the software development lifecycle. At Enhops, we have healthcare domain experts who possess a deep understanding of the healthcare landscape and customizing test automation frameworks to meet specific industry needs.



2. Define Testing Objectives and Scope

Define testing objectives aligned with business goals, focusing on key functionalities and high-impact areas. Determine which types of tests to automate (e.g., functional, regression, performance, security) to enhance software quality.



3. Choose the right Test Automation Tools and Framework

Select right test automation tools and frameworks that integrate with existing systems, support multiple platforms, and offer **low-code/no-code** options. Prioritize solutions with AI capabilities to enhance test automation.



4. Design Test Cases

Design test cases with feedback from product owners, IT managers, and customer facing teams for **high-impact and crucial** features. Make test cases comprehensive, easy-to-maintain, and reusable.



5. Implement Test Automation Framework

Design and implement a **test automation framework** compatible with existing development methodologies, tools, and practices. Collaborate with experts to ensure modularity, and reliability.



6. Monitoring and Test Data Management

Implement **continuous monitoring** with dashboards to track automation metrics. Adopt a robust test data management strategy for automated data handling across environments. This ensures data consistency.



7. Integrate with CI/CD Pipeline

Integrate test automation with **CI/CD** pipelines for continuous testing throughout the development lifecycle. This enables quick feedback loops, allowing for early issue detection and remediation.



8. Continuous Improvement

Regularly evaluate test automation effectiveness. Review progress with stakeholders to ensure **continuous improvement** and alignment of your healthcare applications.

Top Test Automation Tools for Healthcare Applications



Selenium: An open-source tool for web application testing, supporting major browsers & languages.



Ranorex Studio: Integrates with Jenkins, Jira, TestRail, and other leading DevOps tools to automate bug tracking and accelerate your release cycles.



Appium: Designed for mobile app testing, supporting both iOS and Android platforms.



TestSigma: It is a SaaS based application and a no-code testing tool. It helps in testing complex healthcare application workflows without even writing a single line of code.



Keysight: Leveraging AI and Machine Learning, it automates test case generation based on real user journeys and historical data.



AccelQ: A leading codeless AI Automation and Quality Assurance platform that helps in addressing healthcare data and compliance needs, CI-ready, scalable, and secure with in-sprint automation, and provides Seamless integration in the tool ecosystem like Jira, Azure DevOps, TFS, Jenkins, Bamboo, etc.



Katalon Studio: It is a modern and software quality assurance platform with features around Test Authoring, Test Management, Test Execution, Reporting & Analytics.

Improve Patient Care with Test Automation

Software testing should uncover unknown issues and edge cases, not just validate expected functionality. Similarly, healthcare providers should proactively identify, and address patient needs that may not be obvious and test features accordingly.

Test automation helps prevent potential security threats by assessing all aspects of the software. It facilitates validation of new features, automates regression and functional testing, and ensures proper data input validation and access controls. Continuous testing identifies and resolves issues in authentication mechanisms, data handling protocols, and vulnerabilities before major breaches occur.

Best Practices and Strategies for Test Automation Frameworks

Healthcare providers are moving towards software-based patient care along with human touch, but interoperability and security concerns limit the potential of ROI of IT investments. This has created an unprecedented need for robust, adaptable test automation frameworks in healthcare. From optimizing workflows to ensuring regulatory compliance, let's explore how to lay the groundwork for reliable and efficient testing in the healthcare domain.

Best practices and strategies for healthcare organizations for sustainable test automation practices



Opt for Modular Frameworks

Modular automation frameworks in healthcare offer easier maintenance and minimize rework when applications change. Independent, loosely coupled components localize the impact of updates, allowing for more efficient system modifications.



Implement Coding Best Practices

Coding best practices improve automation script quality, making them more modular, testable, and maintainable. This approach simplifies upkeep and extends the framework's lifespan.



Version Control Test Code

Use version control systems like Git for test code. This enables collaboration, code review, and change tracking, which is crucial for managing evolving systems.



Document Test Scenarios

Carefully document all test scenarios, cases, and data using consistent naming conventions. This practice helps teams identify necessary rework when requirements change.



Develop Automated Test Data Generators

Automated test data generators can dynamically create varied test data sets. They ensure test data remains aligned with system changes and minimize maintenance needs.



Follow Keyword and Data-Driven Approaches

This facilitates easier maintenance of scripts, allowing test logic to remain stable while keywords and data are configured externally, providing flexibility for changes.



Create Reusable Test Libraries

Build reusable test libraries for common functionalities. This improves efficiency, reduces redundancy, and allows for parameterized tests. It also simplifies maintenance by centralizing updates in common libraries.



Select Appropriate Automation Tools

Choose test automation tools with active vendor support. This ensures long-term compatibility, maintenance, and feature improvements as technology evolves.



Continuous Test Coverage Expansion

Expand test coverage systematically with each application change cycle. These increase scope steadily while removing redundant and outdated scripts. Sustained coverage growth is key for lasting test suites.



Schedule Time for Reviews and Refactoring

Allocate time for periodic test script reviews, code analysis, comments, and refactoring of frameworks. This activity reduces test debt accumulation and keeps frameworks optimized for evolving systems.



Monitor Test Failures

Analyze root causes of test run failures to identify areas needing maintenance versus genuine application defects proactively. This helps funnel maintenance efforts.



Retire Legacy Tests

Smoothly retire legacy tests that may provide diminishing coverage as applications sunset or undergo modernization initiatives. This prevents overheads.

Ready to explore potential of Test Automation for your applications?

Our test automation PoC helps your organization in assessing the tangible benefits of investing in test automation with detailed ROI analysis.

What we offer

This four-week engagement, led by our automation experts, helps you in getting started with test automation framework and automation suite developed for the identified test scenarios aligned with your business and software delivery objectives.

Our Approach

- 30-minute discovery call
- Two days to deep dive into selected test scenarios
- Comprehensive POC demonstrating our [test automation](#)/QA solution for your evaluation.
- Partner with you for the next steps

Deliverables

You will get:

- Working prototype of Test Automation PoC for hands-on evaluation.
- Tools and Framework Recommendation.
- Test Automation "**itinerary**" that outlines the future steps, goals, and outcomes.

At **Enhops**, we help healthcare organizations overcome all challenges to release high-quality and bug-free software for a perfect healthcare user experience.

Customized PoC

About Enhops, a ProArch company

Enhops works at the forefront of Quality Engineering and Software Product Engineering solutions to suit the most unique business needs. Enhops was established in 2015 with a vision of driving Digital Disruption across industries through **Quality-Engineering, Automation-First, and Smart Testing**. Our philosophy has always been to partner with our clients in their Digital Transformation journey.

Blending Enhops' Quality Engineering capabilities and ProArch's two decades of expertise in Software Product Engineering, we are a true partner who delivers value-based outcomes.

[Contact us for Zero - Cost PoC](#)

United States

Atlanta, Georgia
Rochester, New York

Europe & Asia:

London, United Kingdom
Bangalore, India
Hyderabad, India