

Danske Bank

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Demystifying Quality Assurance & Test Automation with Gofore



GOFORE

Mikael Nylund



Group CEO since 2019

Prior to this, Mikael was e.g. Gofore's Director of M&A, in charge of ramp-up of digital transformation advisory and IT advisory and a Senior consultant in his 13 years with Gofore

Miika Nurminen



Director of Digital Quality Assurance services since 2020

CEO of Gofore Verify Oy (previously Qentinel Finland Oy) since 2020
Prior to this Miika had a long career with QPR Software Corporation

“Coder TuringBots, software agents with AI and GenAI capabilities that generate code in milliseconds, give testing the highest responsibility it has ever had for keeping software and code quality high.”



Agenda

- Market and customer needs
- Defining Quality Assurance and Test Automation
- Case Study: Finnish Tax Administration
- Overview of different tools and software available in the market
- Insights into the Quality Assurance market and future trends



Pioneering an Ethical Digital World.



1,400+

GOFOREANS

191

MEUR REVENUE
(LTM pro forma)

20+

YEARS IN BUSINESS

19

LOCATIONS IN EUROPE

Market and customer needs



Quality is an enabler for adapting to changing business and market requirements

How do we ensure a **fast time-to-market** in product development?
- the CTO



How do we ensure **first-time right** in deploying our information systems?
- the CIO



How do we ensure a **great customer experience** in our digital services?
- the CDO



How do we improve the **Quality & Reliability** of our digital products?
- the VP of Products



DIGITAL SOCIETY

INTELLIGENT INDUSTRY



Expertise That Spans Across All Phases of Your Digital Transformation Journey

Agile	Continuity & life-cycle mgmt	Embedded software & IoT	Project management
Architecture	Cybersecurity	Management consulting	Quality assurance & test automation
Change management	Data & AI	Procurement	Simulators
Cloud and ICT infrastructure	Design	Product development	Software development

Seamless experience through assured Quality in



Embedded systems



Information systems



Digital Services

Throughout the Software Development Lifecycle with



Agile Test
Management

Test
Automation

AI-Augmented Testing

Testing
Capability
Development

Combining
Quality &
Security

Defining Quality Assurance and Test Automation



Quality Assurance and Testing

Quality Assurance (QA) and testing are vital components of software development, aiming to ensure software products meet quality, reliability, and performance standards



QA involves establishing standards, conducting audits, and implementing best practices to prevent defects



Testing evaluates software through unit, integration, system, acceptance, regression, and performance testing to identify and fix errors



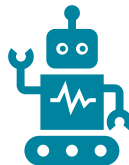
Both QA and testing are crucial in delivering high-quality software, with QA focusing on process adherence and defect prevention, while testing focuses on defect identification and improvement, ultimately enhancing software quality and customer satisfaction

Role of test automation compared to manual testing

Amazon deploys software releases 23,000 times a day.

Test Automation

- Optimizes resources by freeing up manual testers for tasks requiring human judgment
- Streamlines testing by automating repetitive tasks like regression testing, ensuring efficiency and consistency
- Enables scalable testing across various configurations, enhancing coverage as software complexity grows
- Detects defects early in the development cycle, minimizing impact and cost



Manual Testing

- Identifies edge cases and real-world usage scenarios that may be missed by automated tests
- Allows for exploratory testing to uncover unexpected issues and assess user experience
- Facilitates usability testing to ensure software meets user expectations and standards
- Provides subjective evaluation on aspects such as user satisfaction and aesthetics



Quantifiable advantages of test automation compared to manual testing

Test automation enhances efficiency, accuracy and scalability in testing processes, significantly reducing time and costs while ensuring consistent and reliable results compared to manual testing

Speed	Test automation can execute tests significantly faster than manual testing, often by a factor of 5 to 20 times. This means quicker feedback on software quality and shorter time-to-market for products.
Cost Savings	Over the long term, test automation can reduce testing costs by 40% to 60% due to decreased manual effort, increased testing efficiency, and minimized defect resolution expenses.
Increased Test Coverage	Test automation typically improves test coverage by 30% to 50% compared to manual testing, enabling the execution of a larger number of test cases across various scenarios and configurations.
Early Defect Detection	Automated tests tend to identify defects earlier in the development lifecycle, reducing the cost and effort required to fix them compared to manual testing, where defects might be discovered later, leading to higher remediation costs.
Resource Optimization	Automation frees up manual testers to focus on more complex testing tasks, leading to a 20% to 40% increase in overall productivity. Additionally, automated tests can run unattended, allowing testers to utilize their time more efficiently on other tasks.

Case Study: Finnish Tax Administration





Well-functioning taxing systems create trust in society

The Finnish Tax Administration information systems have undergone tremendous changes over the last couple of decades. Test automation ensures the reliability of the systems.

CHALLENGE/OBJECTIVE

The Finnish Tax Administration launched a massive programme to renew its core taxation systems. From the beginning of the Valmis programme, it became clear that they would have **massive testing needs** due to the size & complexity of the renewal.

Main objective was to make the systems operate without disruptions, as disruptions to the taxpayer's systems can cause major problems in the Finnish society.

APPROACH

Gofore's Test Automation and Quality Assurance services for the Finnish Tax Administration cover both continuous application management and new application development.

The role of automation has become increasingly **important** as new features are added to keep up with taxation changes.

- Scope
- Test Automation
 - Agile Test Management
 - Digital QA for Digital Society

Right from the beginning, I have been pleased with Gofore's expertise as our test automation partner. Their experts have done a good and innovative job. They listen to what we need and have been able to solve problems efficiently.

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JARKKO LEVASMA, CHIEF DEVELOPMENT AND INFORMATION OFFICER

OUTCOME/RESULTS

Test Automation ensures Tax Applications and Tax Services work without disruptions.

Benefits & Outcomes:

- 1000% reduction in cost per production defect
- +150 FTE annual reduction in end-user test effort

[The programme for modernising Finland's tax system was awarded as the second-best project in the world in 2021](#)

Positive credit register - Information on loans

TIVI News, 3 April 2024

*“Well now it went smoothly:
Tax Administration's IT project was
completed on schedule, stayed on
budget and immediately caused a
rush of users”*

<https://www.tivi.fi/uutiset/tax-authoritys-it-project-hits-the-mark-completed-on-schedule-within-budget-and-prompted-immediate-user-rush/222d11dc-e4be-4cf1-b2e6-898288755e8a>



Into the pipe went. The positive credit information register, which started operations on time, can now be utilised by both private individuals and lenders. PETTERI PAALASMAA



The positive credit information register developed and maintained by the Finnish Tax Administration opened to private users on Monday 1 April and immediately caused a rush of visitors.

During the first day of operation, as many as 45,000 users logged in to the e-service for private individuals, and more than 82,000 users visited the service's website, a spokesperson for the Finnish Tax Administration tells Tivi. The biggest spike in visitors was seen just after the service opened, and more than 6,000 users logged in to the e-service for private individuals during the first hour.

[Tivi keeps you up to date – Subscribe to our newsletter and get the most important topics in the IT industry straight to your inbox.](#)

After strong identification, the online service allows you to check the up-to-date amount of your credit and possible guarantee liabilities and set a voluntary credit ban. The register contains, among other things, consumer credits of private individuals, personal housing and student loans, and

Overview of different tools and software available in the market



Open-source tools vs. Licensed software tools

“There has been a shift from licensed software tools to open-source tools.”

- Companies that are fluent in the use of open-source tools will thrive in the emerging market
- Consulting companies like Gofore can help and prove that the open-source tools works successfully in a client environment and secure customers' trust in the proposed solution, increase execution speed, reduce cost, enable faster regression cycles, and ultimately produce a high-quality product
- For functional testing, some of the most popular open-source tools on the market are Robot Framework, Selenium, Playwright, Cypress, and Cucumber

Forrester Wave™: Continuous Automation Testing Platforms, Q4 2022

THE FORRESTER WAVE™

Continuous Automation Testing Platforms

Q4 2022

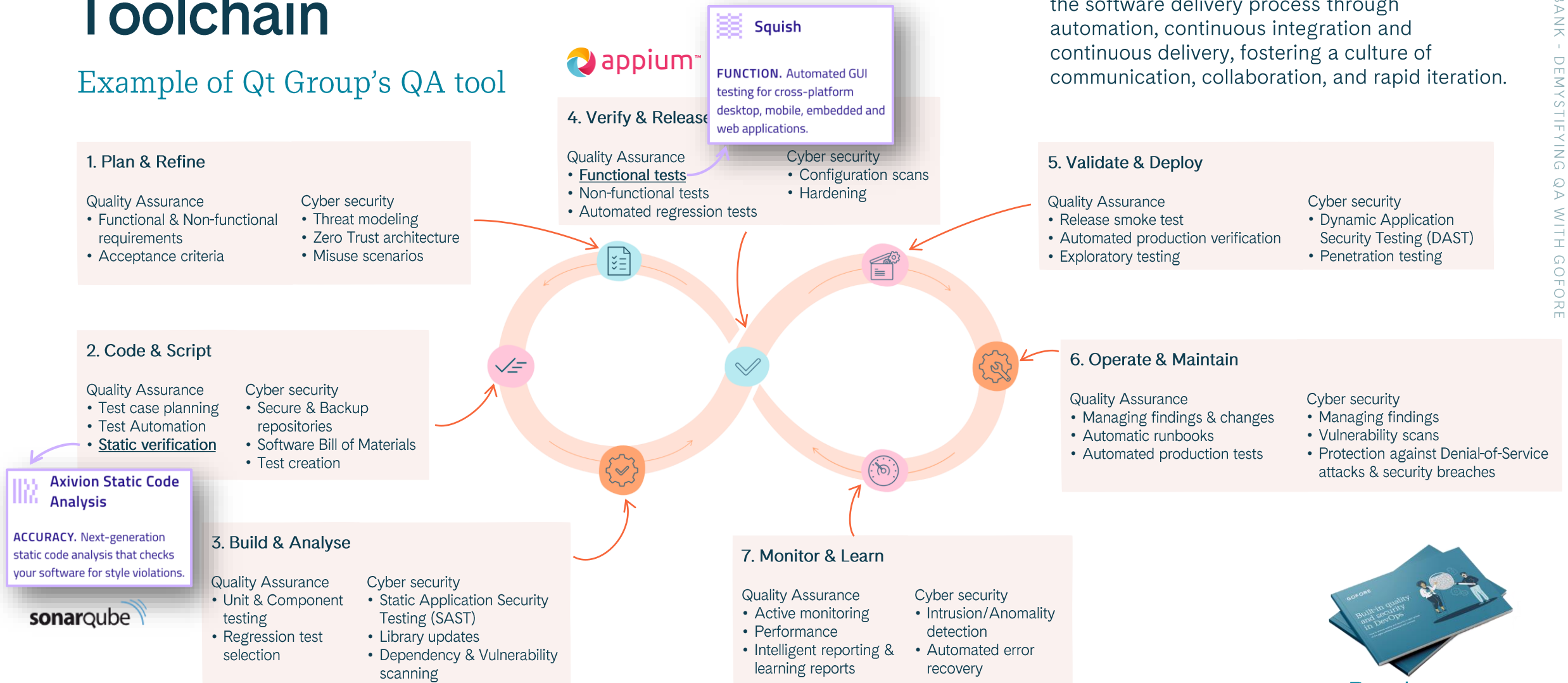


Forrester Wave: Continuous automation testing platforms, Q4 2022

DevOps Software Development Toolchain

Example of Qt Group's QA tool

DevOps is a collaborative software development methodology that integrates Development (Dev) and Operations (Ops) teams, aiming to streamline the software delivery process through automation, continuous integration and continuous delivery, fostering a culture of communication, collaboration, and rapid iteration.



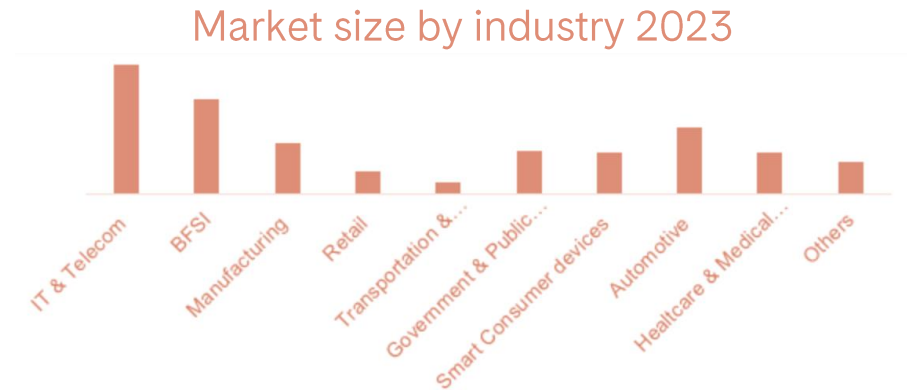
[Read more](#)

Insights into the Quality Assurance Market and future trends



Automation Testing Market

Automation Testing Market size is projected to grow over 15% CAGR over 2023 (\$20BN) to 2032 (\$80BN)



Growth drivers

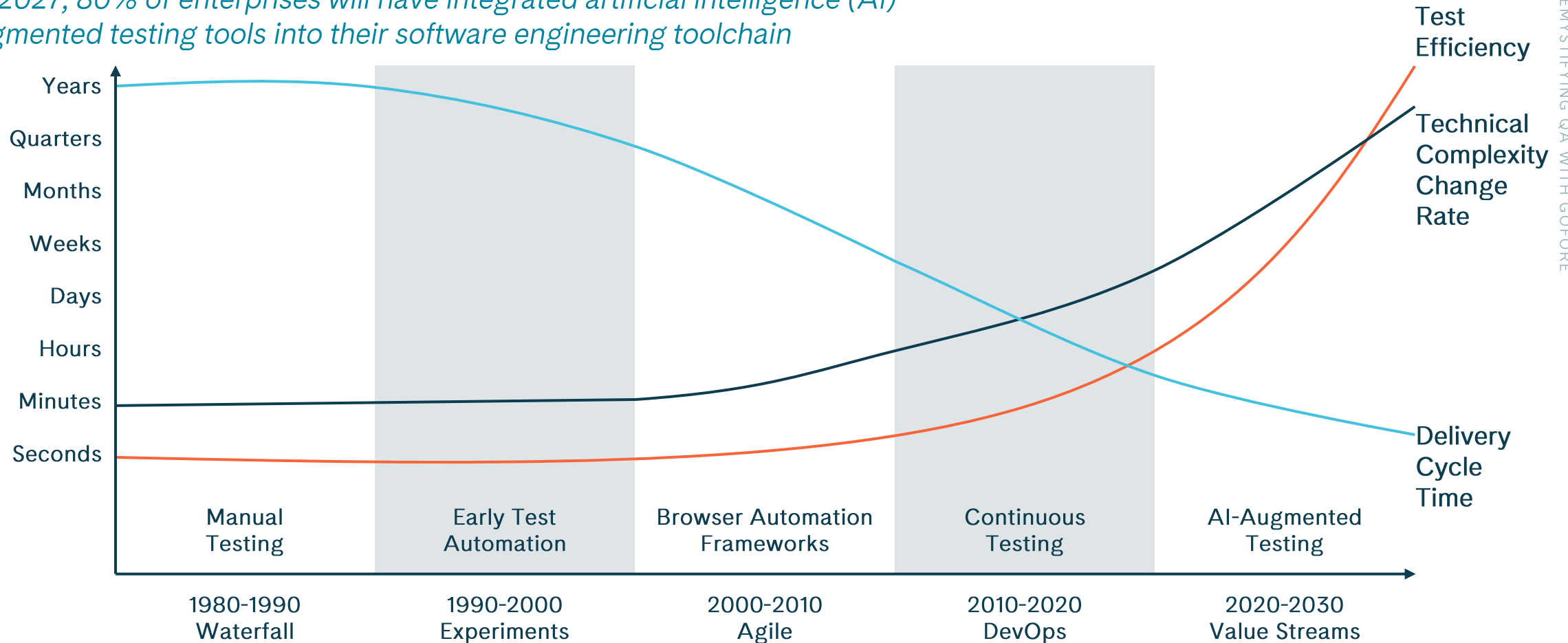
- Continuous automation and testing is more essential than ever
- Increased demand for cloud-based solutions
- High consumption of mobile-based applications
- Growing adaption of digital transformation programs like DevOps
- Rising adoption of agile development environment for quality assurance and testing
- Rising demand for non-functional testing segments (security, performance, compliance, usability and compatibility)
- Growing need for AI and ML in automation testing

Pitfalls and Challenges

- High costs of manual testing dominate testing instead of test automation, and the debt of test automation is constantly increasing
- Lack of skilled professionals

The Evolution of Testing

By 2027, 80% of enterprises will have integrated artificial intelligence (AI)-augmented testing tools into their software engineering toolchain



Pioneering
an ethical
digital world.

A large, solid teal circle is positioned to the right of the main text, partially overlapping the word "world".

GOFORÉ