SYNTHESIZED

The Future Of QA And Test Data Management

10 Trends To Look Out For This Year

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Executive Summary

What should VPs and directors of engineering departments and heads of software testing and development pay particular pay attention to this year? That is, on top of addressing day-to-day test environment issues, pressure to deliver to market faster and organizational speed that can be frustratingly slow.

We've reviewed the trends that will likely make the biggest impact to your QA and Test Data Management this year and lined up the ten most important for your consideration.

But predicting trends is one thing — knowing what to do with them is another. That's why, we recommend going through the list and prioritizing each category's biggest impact on your business, identifying know-how gaps and predicting difficulties in implementation before making your final list and committing to the top three as your focus going forward.

01

Codeless Test Automation for Test Data Generation and Management

Your test automation efforts will benefit substantially from the no-code/low code wave that continues to surge and democratise just about everything in technology.

With it, you'll likely see:

- Faster validation of changes to the code
- Reduced time to market
- Maintaining large IT systems
- Greater test efficiency

For Test Data Management practices, regular codeless test automation means accelerating test creation and offering greater support to developers and testers by freeing up resources and saving costs.

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02

Continuous Adoption of Agile and DevOps Best Practices

According to the Accelerate State of DevOps 2021 report, the number of companies that fully adopted DevOps (called 'Elite' by the authors of State of DevOps) has risen from 7% in 2018 to 26% in 2021. Clearly, adopting DevOps has moved from 'elite' to a best practice 'norm', and those lagging behind need to catch up.

If you consider yourself committed to providing top-tier software solutions on demand, you've probably already adopted Agile and DevOps practices and need no further convincing on Agile vs DevOps.

But you can't stop there.

In the next twelve months, to deliver high-quality customer experiences, you'll need to continue not only to stay up to date with the latest requirements but also to streamline your processes. You should:

- Test early and often with the help of automated testing
- Optimise test cases using AI
- Employ automated dashboards to get a detailed visual of quality

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There are two main domains of testing we recommend looking into more specifically: automated regression testing and manual exploratory testing (the latter being less resource-intensive as it's carried out by team members or product owners).

At a minimum, we recommend performing smoke tests as often as possible and, as a next step, using no-code static analysis and end-to-end tests. These allow you to find bugs in code, provide recommendations for how to make code faster and identify security weaknesses early on. As a bonus, you can use the results of your static analysis for quality gates.

DevOps teams making the most of automation can spend up to 21% less time solving problems in comparison to traditional IT operations teams (2017 State of DevOps). **Imagine what your team could do with reclaiming 21% of their time.**

Continued use of Agile and DevOps promotes collaboration among developers, testers and infrastructure support teams. If you only do one thing this year, we recommend you make this your number one priority.

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03

AI and ML-Based Testing

The AI market is currently valued at $62.3 billion with a compound annual growth rate of 40%*.

AI and Machine Learning have already proved their usefulness in development and testing practice — overhauling test automation is next.

For software testing, you can combine the intelligent problem-solving capabilities of AI with the pattern recognition technology applied by ML algorithms that predict trends and you'll instantly improve your:

- Test creation
- Test analysis
- Test maintenance

By automating your tests you can fix problems before they happen. The more tests you run using AI and ML, the smarter they become at maintaining stable tests.

Plus, for optimal test data generation — regardless of your vertical — this means you can increase the number of use cases that result in full confidence in software releases (i.e. all bugs acknowledged early, and no critical or P1/P2 bugs left open).

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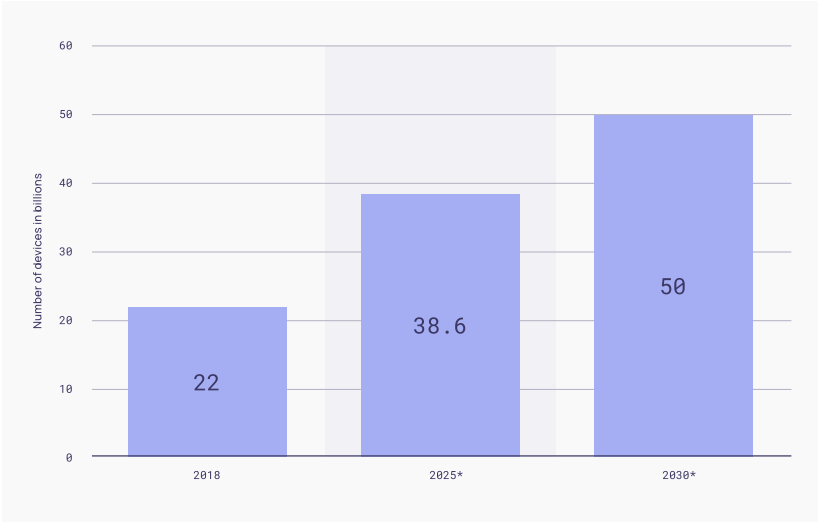
04

Internet of Things (IoT) Testing

In 2021, there were more than 23 billion IoT active devices connected to the internet. By 2030, the number is expected to climb to an estimated 50 billion*.



Software is embedded in IoT devices and generates considerable amounts of data. This expected growth pushes developers and testers to optimize wherever it's possible.

Automated tests require data, and the growth of IoT will result in the growth of available data. If you want to avoid being overloaded by data and risk losing signal of value, finding an efficient approach to data management for IoT testing is a priority this year.

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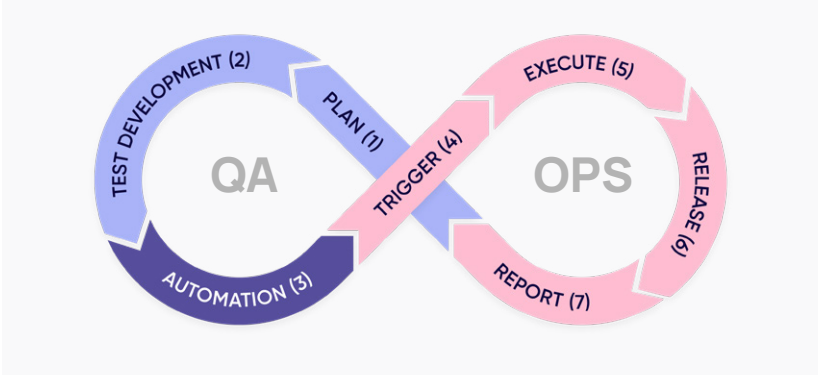
05

Increase in QAOps

QAOps is a combination of DevOps and QA processes in one, ensuring the delivery of high-quality software. It incorporates the testing process into DevOps, allowing QA engineers to collaborate with developers while the software is in development.



QAOps is expected to develop a new software process model enhancing the quality of the process, and it will play an important role in the software development life cycle which will become more streamlined.

The process involves testing a product, or part of a product, as and when the update is integrated, which reduces a QA team's waiting time. This helps to spot problems earlier and fix them quicker preventing further issues rising from bugs. With faster cycles, you have more time to work on other features and improve them.

Because QAOps includes continuous testing, customers have a better experience using the product — the higher the quality, the higher the customer satisfaction.

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06

Cybersecurity Testing

Security is a key consideration in testing and companies must continue to invest in mitigating software bugs and breaches. Cybersecurity QA testing uses a variety of security testing techniques for maximum protection.

They can:

- Identify security weaknesses
- Validate existing cybersecurity measures
- Protect stakeholder information

QA and Test Data Management will jointly play an important role in cybersecurity — test automation and the availability of accurate high-quality data brings cost-efficient software deployment processes which mitigates security risks and maintains compliance.

For the most common types of software weaknesses your businesses can face, we recommend running through this list, maintained and updated by OWASP and CWE.

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07

Increase in “Just-In-Time” Data for Testing and Analytics

In 2022, the supply-chain crisis will probably leave a noticeable dent on your data pipelines — data teams will find it challenging to gain insights into the supply chain they’re tasked to optimise.

Companies will need to look for innovative solutions to gain faster, just-in-time analytics for their data teams. Their approach to Test Data Management will be crucial to the provision of real-time test data for testing and analytics.

Reducing data friction in pipelines through self-service data requests will make data swiftly available and ready to use.

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08

Using Visual/Audio Testing in Sensitive Data Environments

Audio and video quality testing services allow companies to track software changes and ensure product compatibility. With an increase in remote work, the use of communications software to maintain connections and for surveillance is essential.

To sustain high audio and video quality standards, companies need to ensure that their testing capabilities are up to standard and applying Test Data Management practices help ensure scalable and efficient test automation.

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09

Advanced CI/CD Pipelines

With the insane volume of software development AI now powers comes the need for additional resources for hardware and computing power.

Do your current CI/CD pipelines have the capacity to cope? Can you cope with increased amounts of data in the long run?

Advanced CI/CD are essential for Test Data Management — your practices must continue to evolve and streamline the implementation of test data into the pipelines. If you want to ensure sustained growth, consider looking into what the latest tools and practices can do for you.

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10

Increased Emphasis on Privacy and Alternatives to Data Obfuscation

Data privacy regulations, such as the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA) have put a spotlight on Test Data Management. This, in turn, increased the pressure on organisations to guarantee the protection of highly-sensitive personal data — by removing it from test data.

Previously, there was no structured oversight in the process of the masking or removal of sensitive data. As a result, there could have been multiple copies of production data infiltrating the test process.

This year, the tightening of existing and new privacy laws (such as GDPR, CCPA, LGPD, and others, listed here) will require new approaches to Test Data Management practices, particularly test data creation and the modern alternatives to data obfuscation, to ensure privacy.

High-quality, secure data for test environments — that's what everyone needs this year.

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The Bottom Line

Trends give us a solid basis and indication of a general direction in which things are developing or changing. **How many of these trends will affect you this year? What are your top concerns?**

Once you've reviewed the list and answered how likely they are to impact your business, the real planning can start.

For a library of practical advice around agile test data management, test generation, DataOps, and QAOps topics, please head to www.synthesized.io/resources.

SYNTHESIZED

Agile Test Data Management (TDM) for Fast-Growing Organisations

Synthesized enables you to bring Agile Transformation into QA and Testing operations. It offers an out-of-the-box data transformation engine that provides data for Dev & QA and moves QA operations to the cloud faster, while staying compliant with data governance and privacy. The API-driven engine uses simple YAML configurations and is easily integrated into your CI/CD processes.

WITH SYNTHESIZED YOUR TEAMS CAN:

- Migrate apps to the multi-cloud 20%+ faster.
- Deliver features and releases 50% faster while improving quality.
- Get the right-sized test databases for QA & Dev in minutes. Full confidence in software releases.
- Protect sensitive data in production databases.
- Robustness against complex attacks such as linkage attacks and attribute disclosure.
- Scalable to TBs of data and complex microservices architectures.
- Support of complex schemas and referential integrity (1500+ tables with complex dependencies).

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