

WORLD QUALITY REPORT

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North America

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IMPORTANT TRENDS

- The most noticeable trends in QA and Testing today relate to the increasing adoption of agile and DevOps and the resulting de-centralization of certain types of testing, challenges with regard to test data and test environment management and the perceived shortage of QA and Testing professionals with the skills and experience required by current paradigms.
- 90% respondents in the US and 69% in Canada have seen an increase in the proportion of the IT budget being spent on QA and Testing over the last four years.
- The increasing focus on speed and time-to-market is giving rise to hybrid QA organizations, where the digital side of operations is being de-centralized, while operations based on legacy systems are being centralized with a Testing Center of Excellence (TCoE).

The US, which is the largest economy in the world, has fully recovered from a multi-year recession. Sentiments across the region are bullish, and given the importance of technology in driving business today, this has led to a rise in IT budgets across North America. In addition, the continued spread of Digital Transformation across various sectors, the growing convergence of different technologies and the rise of Artificial Intelligence (AI) are all having an important impact on IT in the region.

With QA and Testing, the most noticeable trends today relate to the increasing adoption of agile and DevOps and the resulting de-centralization of testing, test data and environment management challenges, and the perceived shortage of QA and Testing professionals with the skills and experience required by the market.

A direct result of some of these trends is that the proportion of the IT budget being spent on QA and Testing has been growing. Our survey results reveal that as many as 90% respondents in the US and 69% in Canada have seen such an increase in their organizations over the last four years. According to respondents, the main factors driving this rise are 'the increased complexity of IT applications', 'the shift to agile and DevOps causing more test

iteration cycles' and 'the greater stress being put on quality'. At a fundamental level, this is due to the increased importance of QA and Testing in a digital age, where customer experience 'horror stories' can go viral overnight and cause immense damage to the brand.

Arguably one of the biggest trends in QA and Testing in North America is the continued adoption of agile across sectors. The laggards in this regard are mainly banks and public sector companies with a heavy dependence on legacy systems. However, even they are expected to adopt agile methodologies for the majority of their operations over the next five years. According to our survey, the most popular agile frameworks adopted in North America include Scrum, Scaled Agile Framework (SAFE), Dynamic Systems Development Method (DSDM) as well as various hybrid models. Of course, there are associated challenges. Some of the more common problems faced by organizations in implementing agile include difficulties with in-sprint automation, a lack of effective communication and a lack of clarity on the distribution of roles and responsibilities in Scrum teams.

Compared to agile, the adoption of DevOps is a more recent trend and the most common DevOps approaches among North

American organizations include the virtualization of environments, use of cloud-based test environments and the use of continuous monitoring and predictive analytics.

This increasing adoption of agile and DevOps is having an important impact on the organization of testing activities. These approaches put an increasing focus on speed and time-to-market and lead to the creation of smaller, integrated teams which can handle a variety of tasks. This is giving rise to hybrid QA organizations, where the more digital side of operations is moving towards de-centralization, while operations based on legacy systems are centralized with a Testing Center of Excellence (TCOE). However, this move towards decentralization is still an emerging trend and our survey reveals that the centralized TCOE remains the most popular model for the organization of testing activities today. According to our respondents, 'captive TCOE in a build-operate-transfer model', 'usage of a crowd-sourcing model for digital testing' and 'hybrid TCOE' are the other popular options.

Another major trend relates to digitalization, which in terms of QA and Testing gives rise to the need for mobile and multi-channel testing. Such testing usually focuses on things like user experience and user interface. As per our survey, when asked where they focus their efforts when testing mobile applications, US respondents gave the highest weighting to 'efficiency/performance' and 'user interface/ease of use' while Canadian respondents gave the highest weighting to 'functionality' and 'efficiency/performance'. Similarly, when asked about the biggest challenges in testing mobile and multi-channel applications, respondents across the region chose 'not enough time to test' and 'don't have the right testing method'. In addition, expert opinion also points to a lack of trained and experienced mobile testing experts being an issue, especially in a scenario where test environments and technology are changing as rapidly as in the mobile and digital space.

The shortage of time to test reported by our respondents is, in fact, an important factor that has led to the recent rise of predictive

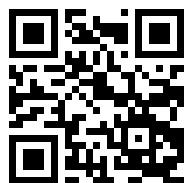
analytics in testing. This rise of techniques and tools for risk based testing and defect prediction modeling can be said to be another upcoming trend.

Apart from the above trends, there are also some key challenges being faced by the QA and Testing function in North America. One of these, as already mentioned, is a lack of the right kind of skills among QA and Testing professionals. This is a direct result of the increasing adoption of DevOps, agile and bi-modal methods of delivery as well as rapidly changing technologies and the convergence of social, mobile and cloud (SMAC) solutions. Due to all these trends, there is a need to re-tool or re-skill the existing pool of testers and this continues to be a major challenge in North America.

There are also challenges which need to be solved with regard to test data management. This is an area that has become fairly complex due to DevOps and agile models as well as the move to the cloud. In addition, the General Data Protection Regulation (GDPR) and its associated requirements for data privacy have brought this area into greater focus. There is also a lot of interest around test environment management right now as organizations search for ways to automate environment provisioning and deployment so as to speed up the entire testing cycle.

In addition to the above points, the increasing use of automation, a move towards hybrid cloud and the increasing complexity of testing Internet of Things (IoT) products rounds out the picture of the QA and Testing market in North America.

In summary, it is a market that has been quick to adopt some of the latest QA and Testing trends and is slightly ahead of the curve when it comes to the maturity of its testing practices. Yet, there still remain some important challenges that will likely be resolved over the next few years.



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