

EVALUATION FOR AMDOCS:

# Quality Engineering Services 2022

## Introduction

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This is a custom report for Amdocs based on NelsonHall's 2022 NEAT vendor evaluation for *Quality Engineering (QE) Services*, including:

- A review of the market segments where Amdocs was identified as a Leader and why
- A summary of Amdocs' QE service portfolio
- A summary of the technology enablers underpinning Amdocs' QE services.

The NelsonHall Vendor Evaluation & Assessment Tool (NEAT) for Quality Engineering Services analyzes the performance of vendors offering QE (software testing) services. The NEAT tool allows strategic sourcing managers to assess the capability of vendors across a range of criteria and business situations and identify the best performing vendors overall, and with specific capability in application security testing, continuous testing, AI & cognitive testing, UX testing, and cloud migration testing.

Evaluating vendors on both their 'ability to deliver immediate benefit' and their 'ability to meet client future requirements, vendors are identified in one of four categories: Leaders, High Achievers, Innovators, and Major Players.

The Leaders category, which identifies the highest performers, is comprised of vendors that exhibit both a high ability relative to their peers to deliver immediate benefit and a high ability relative to their peers to meet client future requirements.

NelsonHall has identified Amdocs Quality Engineering (AQE) as a Leader in the 2022 NEAT vendor evaluation for Quality Engineering Services in 5 of the 6 segments evaluated by NelsonHall:

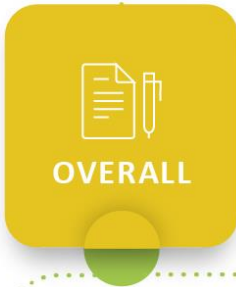
- Overall
- Continuous Testing
- AI & Cognitive Testing
- Cloud Migration Testing
- UX Testing.

The next section presents a diagrammatic summary of AQE's leadership in these categories, and this is followed by explanations of its leadership positioning in each category.

## Amdocs Leadership in Quality Engineering Services

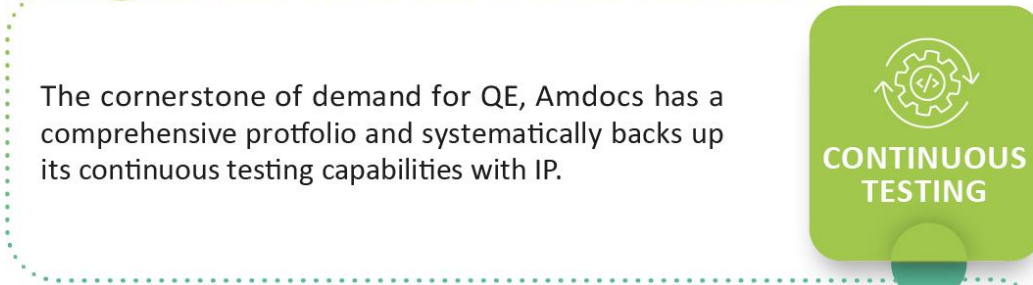
# Amdocs QE Leadership

At a Glance



### OVERALL

Amdocs has a wide portfolio, addressing its own and non-Amdocs COTS and custom applications. Furthermore, Amdocs has a key strength in the communication services space. In Telecoms & Media, NelsonHall ranks Amdocs No. 1 by revenue globally, with a 14.7% market share of QE spending.



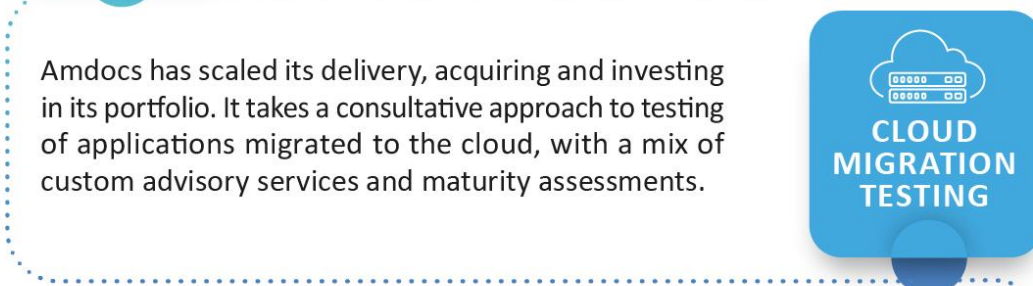
### CONTINUOUS TESTING

The cornerstone of demand for QE, Amdocs has a comprehensive portfolio and systematically backs up its continuous testing capabilities with IP.



### AI & COGNITIVE TESTING

Amdocs has invested a great deal in this area. In AI-based analytics, it has prioritized use cases such as regression test prediction. In AI-based automation, it has developed its Auto-Pilot IP.



### CLOUD MIGRATION TESTING

Amdocs has scaled its delivery, acquiring and investing in its portfolio. It takes a consultative approach to testing of applications migrated to the cloud, with a mix of custom advisory services and maturity assessments.



### UX TESTING

In usability testing, Amdocs uses psychologies to understand user behavior, along with UX and interior designers. In accessibility testing, AQE targets initial assessments for WCAG 2.0 regulatory compliance and web application maintenance.



## Overall

Amdocs Quality Engineering has a wide portfolio (see Exhibit 2), addressing Amdocs and non-Amdocs COTS and custom applications. AQE has articulated its growth strategy around three axes:

- *Further automation and service specialization* – AI plays an important role here, focusing on providing automation at scale. To support its automation efforts, AQE has invested in many proprietary IPs, most of which are consolidated under the Amdocs Cognitive Quality Platform
- *Digital, cloud, and UX* – touched off by the pandemic, the company has experienced strong demand for digital testing, and has responded by expanding its digital testing offering for mobile and connected device testing, which is enhanced by a crowdtesting solution (jointly with partners). Resiliency and performance testing are also key components of this offering, particularly for its cloud services
- *New growth initiatives* – e.g., geographical expansion and new services. The company has created new offerings such as 5G-related services, network testing, and services such as provisioning and monetization.

Amdocs has a key strength in the communication services space, where it is a reference vendor. In Telecoms & Media, NelsonHall ranks Amdocs as No. 1 by revenue globally, with a 14.7% market share of QE spending (2021 revenues).

### Amdocs' QE Technology Enablers

Amdocs Cognitive Quality Platform, the former 36ONE, is Amdocs' central platform under which it has regrouped its IP investments. The platform integrates with technologies such as Atlassian (Jira, Jira Align), Micro Focus Octane/ALM, CI/CD orchestrator such as Jenkins and Bamboo, GitLab and GitHub, Grafana, Kibana for reporting, Kubernetes for microservices-driven projects, and other tools such as TOSCA, SOAP, Selenium, Appium, TestNG, and Botium.

Amdocs continues to invest in the Amdocs Cognitive Quality Platform, which is supported by over 50 patents, and has, in the past year, invested in several IP initiatives: Auto-Pilot, and also testing API on Linux operating systems (as part of its transition towards open-source software). AI and cognitive-based automation are a central part of Amdocs' strategy.

AQE is increasingly promoting open-source software through Ginger (Ginger.amdocs.com), which is part of Amdocs Cognitive Quality Platform. The practice is also expanding its open-source capabilities, for example, with API testing on Linux OS.

Exhibit 1 provides an overview of the Amdocs Cognitive Quality Platform's main categories.



### Exhibit 1: Amdocs Cognitive Platform Main Categories

Platform Category	Description
Ginger	Ginger is Amdocs' primary IP for functional automation design and execution. It is a 'codeless' automation tool and targets web, back-end, and mainframe applications, mobile apps, APIs, and databases. It relies on technologies including open-source software, AI, and integrates with Tosca, Cucumber, REST-assured, TestNG and SOAP
Amdocs Intelligent Test Manager	Intelligent Test Manager is an IP that collects the data from different systems (including test project management tools, test execution, TDM, and DevOps tools), processes the collected data, and provides a dashboard. It gives current state visibility, predictions, and recommendations on the next step through its Intelligent Test Manager Command Center. Command Center has several dimensions, e.g., urgent care, quality metrics, project analytics, and automation
Amdocs Cognitive Test Predictor	Amdocs Cognitive Predictor enables regression test predictions and defect triaging. It relies on AI (e.g., ML and DL)
Amdocs Test Data Manager	Amdocs Test Data Manager is a test data management tool for both production data and synthetic data. Its capabilities for production data include data extracting and masking. It is a self-service tool
Amdocs Test Environment Manager	The Amdocs Test Environment Manager provides viewing topology of a specific environment, booking an environment, creating an environment, monitoring an environment, and creating a sanity check. It is a self-service tool
Amdocs Performance Test Manager	Amdocs Performance Test Manager provides performance testing for web and client-server applications and specific use cases such as APIs and video streaming on a browser. The IP supports load testing and resiliency/chaos engineering. It includes a dashboard. It integrates with CI/CD tools and provides performance comparison based on past data. It is deployable, using Docker containers, on the cloud, and on premise

Source: Amdocs and NelsonHall



## Amdocs’ QE Service Portfolio

Amdocs’ technology enablers underpin its entire offering, with proprietary IP supporting the services shown in Exhibit 2:

*Exhibit 2: Amdocs’ QE Service Portfolio*

Category	Purpose	Services
Quality of Processes	QE modernization services	<ul style="list-style-type: none"> <li>- Maturity assessment service</li> <li>- Modernization roadmap service</li> <li>- QE consulting service</li> </ul>
	Cognitive QE services	<ul style="list-style-type: none"> <li>- QE analytics service</li> <li>- QE data governance service</li> <li>- QE embedded AI and ML service</li> </ul>
Quality of NextGen	Data and AI QE services	<ul style="list-style-type: none"> <li>- Data validation service</li> <li>- BI/DW QE service</li> <li>- AI model testing service</li> <li>- Bill to bill validation service</li> <li>- Chatbot testing service</li> <li>- Data analytics services</li> </ul>
	Network QE services	<ul style="list-style-type: none"> <li>- Network infrastructure testing service</li> <li>- Network core testing service</li> <li>- RAN testing service</li> <li>- SDN and NFV testing service</li> <li>- Network assurance testing service</li> <li>- Mobile edge device testing service</li> <li>- Network LaaS</li> <li>- Network cloud testing services</li> </ul>
Quality of Experience	Digital experience QE services	<ul style="list-style-type: none"> <li>- Usability testing service</li> <li>- Accessibility testing service</li> <li>- Compatibility testing service</li> <li>- Visual testing service</li> <li>- IoT QE service</li> <li>- IVR testing services</li> <li>- Media &amp; entertainment testing service</li> <li>- Device QE service</li> <li>- Crowdtesting service</li> </ul>
	Resilience QE services	<ul style="list-style-type: none"> <li>- Performance engineering service (inc. chaos, elasticity &amp; scalability)</li> <li>- Disaster recovery service</li> <li>- Cloud migration testing service</li> <li>- Cloud resilience testing service</li> <li>- Cloud data testing service</li> <li>- Security testing service</li> </ul>
Quality of Operations	Continuous QE services	<ul style="list-style-type: none"> <li>- End to end testing services</li> <li>- Model-based testing service</li> <li>- AI-driven automation service</li> <li>- Integration testing service</li> <li>- Application testing service</li> <li>- Performance testing service</li> </ul>
	Acceleration QE services	<ul style="list-style-type: none"> <li>- Test environment management service</li> <li>- RPA testing service</li> <li>- Test data management service</li> <li>- Service virtualization service.</li> </ul>

Source: Amdocs and NelsonHall



## Continuous Testing

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Continuous testing remains the cornerstone of organizations' demand for QE services.

AQE has repositioned its capabilities from centralized TCoEs to decentralized QE operations, supporting agile projects. Amdocs has developed a comprehensive portfolio and is systematically backing up its continuous testing capabilities with IP. The practice wants to provide "automation at scale" to help clients transition quickly to continuous testing. To provide such automation at scale, AQE focuses on:

- Modeling of UIs and APIs to automatically create test scripts
- Creation of a central repository of automated artifacts, to build test scripts for their reuse
- Automated maintenance of test scripts when new code is introduced.

The Amdocs Cognitive Quality Platform is the foundation of the practice's automation around continuous testing, AI and analytics, test support services (test data management, test environment management, service virtualization, and container-based deployment), resilience, and performance engineering.

## AI & Cognitive Testing

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AI is an area where Amdocs has invested a great deal in recent years. AQE has focused on AI-based analytics and AI-based automation.

In the analytics space, AQE has prioritized several use cases such as regression test predictions, defect triage, impact analysis, and test data prediction.

AQE has developed the Amdocs Intelligent Test Manager to bring QA visibility to the client's operations. Intelligent Test Manager is an IP that collects the data from different systems (including test project management tools, test execution, TDM, and DevOps tools), processes the collected data, and provides a dashboard. It gives current state visibility, predictions, and recommendations.

In the AI-based automation space, Amdocs has developed its Auto-Pilot IP to make the creation of test scripts accessible to non-automation engineers. Auto-Pilot's approach helps to automatically create test scripts through identifying a web application's objects, properties, and values. Another benefit of Auto-Pilot is that it helps to maintain test scripts through regular scans.

## Cloud Migration Testing

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Globally, CSPs' application migration to the cloud activities have accelerated in the past 18 months. As a result, Amdocs has scaled its delivery. It acquired Sourced Group, a specialist firm headquartered in Toronto to expand its cloud migration capabilities further. The company now has 1.2k cloud experts with a telecom background.

Amdocs has also invested in its portfolio. The company takes a consultative approach to testing of applications migrated to the cloud. It relies on a mix of custom advisory services and maturity assessments to help position organizations in their cloud migration testing journey.



On the execution side, Amdocs has mapped how to test the features of cloud infrastructures. For example, the company prioritizes how to test cloud specificities such as cloud auto-scaling, disaster recovery, and resiliency/failover testing.

Finally, AQE works with specific tools such as infrastructure as code (IAC) for testing activities such as provisioning of test environments.

## UX Testing

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Amdocs is active in UX testing, primarily around usability testing and accessibility testing,

In *usability testing*, Amdocs relies on psychologists to understand user behavior, along with UX and interior designers. The company conducts several usability activities, one key activity being live observation and analysis of end-users.

Amdocs has continued to invest in its usability research capabilities, initially through acquiring projekt202 in 2019, strengthened by ADK Group in 2021.

Crowdtesting is an essential element of AQE's UX testing portfolio. AQE partners with Applause to conduct usability, compatibility, content, and accessibility testing. AQE highlights it takes full responsibility.

In *accessibility testing*, AQE targets initial assessments for WCAG 2.0 regulatory compliance and web application maintenance. To drive automation as part of continuous testing/DevOps, AQE has aggregated the different tools, overcoming tool fragmentation.



## Summary

Amdocs was identified as a Leader in multiple market segments in NelsonHall's 2022 NEAT vendor evaluation for Quality Engineering Services.

Amdocs' outlook is very much focused on test automation and structured around continuous testing and AI. The company is now a serious player in this space, with Amdocs having an AI offering matching the best offerings in the market. To summarize:

- *Overall:* in the communication services space, Amdocs is a reference vendor. The company's software-led business model that results in service engagements is unique in the industry. The company is investing overall in newer areas, such as network virtualization, data monetization and 5G networks, and new business models along with media
- *Continuous testing:* the offering is comprehensive and backed by its IP. The company has the expertise, a structured approach, and mapped testing requirements with cloud applications
- *Cloud migration:* Amdocs favors a consultative approach to application migration projects across software and cloud infrastructure testing. The company uses its various IP for AI-based testing, performance testing, and data migration validation. It also uses tools from the hyperscalers for cloud infrastructure testing
- *Model-based testing:* the offering is comprehensive
- *AI-based analytics:* the service portfolio is comprehensive
- *AI-based automation:* Amdocs has started the automation journey and has expanded its IP, Auto-Pilot, to mobile app testing
- *Testing of chat- and voice bots:* Amdocs has a testing framework using BDD for testing virtual assistants
- *IP and open-source:* Amdocs is one of two significant vendors taking a systematic approach to releasing their testing IP as open-source. This approach differs significantly from most Indian vendors now monetizing their IP with a non-linear strategy in mind. Amdocs highlights its open-source-centric IP strategy helps the company get commitment from the open-source community, reassures clients about potential technology lock-in, and provides service opportunities and benefits to attract talent.



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