ISG Provider Lens™

Next-Gen Application Development & Maintenance (ADM) Services

Continuous Testing

A research report comparing provider strengths, challenges and competitive differentiators

Global 2019 Quadrant Report

August 2018

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Infosys®

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The research and analysis presented in this report includes findings from the ISG Provider Lens™ program and ongoing ISG Research programs, interviews with ISG advisors, briefings with services providers and analysis of publicly available market information from multiple sources. The data collected for this report represents information that was current as of March 2018. ISG recognizes that many mergers and acquisitions have taken place since that time, but those changes are not reflected in this report.

All revenue references are in U.S. dollars ($US) unless noted.

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ISG Provider Lens™

ISG Provider Lens™

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EXECUTIVE SUMMARY

The global next-gen ADM market is following two different growth trajectories for the application development and application maintenance segments. Next-gen application development has branched out into areas such as analytics, IoT, cloud native architectures, SaaS-based offerings, security, customer experience (CX) and user experience (UX), mobile apps and others. Most next-gen development activities are focusing on solving business problems, improving profits or revenue, or enhancing brand value, rather than acting as a support mechanism for running IT operations. Concurrently, next-gen maintenance activities are focusing on finding different avenues to achieve cost savings by using technologies like intelligent automation. Such efforts can eventually reduce the cost of maintenance activities by 20 to 30 percent, thereby allowing enterprises to reinvest in development activities.

Next-Gen ADM

- **Digital labor is making the existing workforce more productive:** Digital labor goes far beyond the realms of bot-based automation to include diagnostic, predictive and remediating capabilities using intelligence acquired over time to solve non-linear problems. Digital labor is enabling the current ADM workforce to focus on higher-value work. For example: While working on a data analytics project, the analyst can now spend more time analyzing data, rather than checking the data authenticity, quality and applicability.

- **Demand for hybrid cloud environments is higher:** Enterprises are increasingly creating cloud-native applications that can be moved directly to the public cloud. However, owing to security and regulatory reasons, a pool of applications still resides in the dedicated private cloud. Hence, enterprises are seeking providers that can accomplish migration and maintenance across cloud environments.

- **Business-based metrics are used more often to measure results:** To divert budgets towards digital transformation, enterprises are looking for methods to quantify the next-gen services and their direct impact on business. Commercial contracting structures and preferences are shifting from traditional input-based transactional models to ones that are built on business-based metrics.

Agile Development

- **DevSecOps is becoming the new normal:** DevSecOps has replaced DevOps across the board. Enterprises and providers alike are realizing that security cannot be an afterthought. Thus, during early DevOps implementation phases, security principles are being incorporated as a default feature.

- **Rapid application development is on the rise:** As enterprises transform by becoming agile, there is a growing necessity for tight integration among their business, engineering and operations organizations. These organizations are required to maintain rapid development cycles to quickly add features to existing offerings and release new ones in the market. Such enterprises are preferring to partner with service providers that can offer a globally distributed agile organization that balances the cost dynamics with the need for speed.

- **Full-stack developers are preferred for application development:** More and more, providers are preferring full-stack developers for application development to avoid unnecessary coordination cycles. Having a single resource provides a 360-degree view of the environment to speed the entire development cycle. A full-stack developer is a developer that has knowledge and expertise to work from back-end through front-end application components.

Continuous Testing

- **Companies want to test automation as-a-service:** Test automation-as-a-service is being advocated as a differentiator to win testing contracts with dominant digital scope. Enterprises are engaging with service providers to build test automation centers of excellence and initially manage them.

- **Domain and vertical integration is necessary:** A wide range of testing services are being mapped with industry-specific tools, reusable scripts and accelerators. The services being mapped include test consulting, application testing, application security testing, enterprise solution testing and IoT testing. Moreover, service providers are creating specialized vertical solutions for testing clients.

- **Testing is becoming a technology enabler:** Testing is being viewed as an enabler to implementing emerging technologies. For example, for many IoT projects, service providers and clients are resorting to SIL (software-in-a-loop) and HIL (hardware-in-a-loop) testing approaches to test the real-world performance of connected devices.

- **Demand for full-stack testing engineers is increasing:** The desire to achieve continuous testing capability has led to greater demand for full-stack testing engineers. Such resources are expected to have knowledge across test phases. For example, a full-stack engineer might be required to perform test execution automation on Selenium, integrate it with Jenkins for continuous integration and then provision the test environments in public cloud and virtual environments.

Next-Gen ADM – BFSI

- **Blockchain technology is finding more use cases in the financial industry:** Interbank use cases are still rare; however, banks are making use of the technology to simplify their existing systems and removing process bottlenecks. Blockchain is enabling faster and cheaper settlements and is shaving a significant portion of the transaction cost, while improving transparency.

- **Customer intelligence is becoming the predictor of growth:** Advances in data analytics are helping financial institutions to meet and anticipate customer needs. AI is becoming a reality for running various banking functions, including marketing and sales, wealth management and compliance.

- **Public cloud is becoming the default services model:** Non-core functions like CRM, HR and F&A already are being delivered through a cloud-based SaaS model. Gradually, as the CXO organization becomes more comfortable, core functions such as payments, billing and credit scoring are being moved to the public cloud.

- **A design-thinking approach is key to delivery:** A customer-first design is enabling application delivery. As banking consumers are becoming more tech-enabled, e-banking is becoming the primary channel to onboard, serve and retain them. Hence, each service, from account onboarding to loan disbursal, is being designed to decrease customer effort and enhance experience.

Next-Gen ADM – Healthcare & Life Sciences

- **Data-driven initiatives are coming of age:** Healthcare and life sciences (HCLS) clients are adopting an analytics-driven approach to transformation projects to harness data and generate insights, thereby becoming more customer-centric and optimizing the entire value chain. The sector is also stepping into newer technology areas, like industrial machine learning (IML), which uses big data to improve healthcare standards. Such applications could lead to better clinical decisions, lower readmission rates and fewer adverse events.

- **Cloud adoption is accelerating:** Cloud resources are addressing process inefficiencies, enabling end-to-end visibility and streamlining commercial operations for various life sciences companies. In the payer and provider segments, cloud adoption is boosting connectedness and information accessibility among practitioners, payers and patients.

- **Maintenance savings are funding change initiatives:** HCLS organizational IT budgets have remained flat for several years. So, there has been more emphasis placed on reducing discretionary spend for maintenance services by using automation levers, then using the savings to fund business intelligence, cloud migration, data warehousing and platform development engagements.

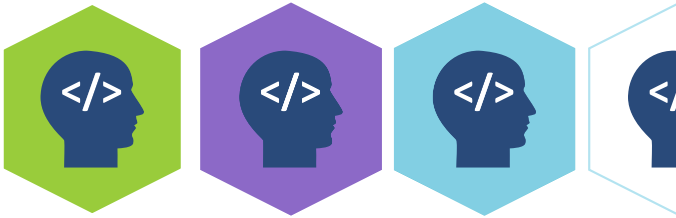
Next-Gen ADM – Manufacturing

- **IoT is driving efficiencies:** The scaled adoption of IoT is enabling predictive maintenance, self-optimizing production and automated inventory management, resulting in lower maintenance, maximized equipment life and uninterrupted production cycles. Although the IoT has far-fetched applications benefits, most use cases still pivot around value chain optimization.

- **The concept of smart factories is transforming the production process:** IIoT and smart factories are not just making the shop floor more agile and efficient, they are also leading to higher process compliance and better-quality management.

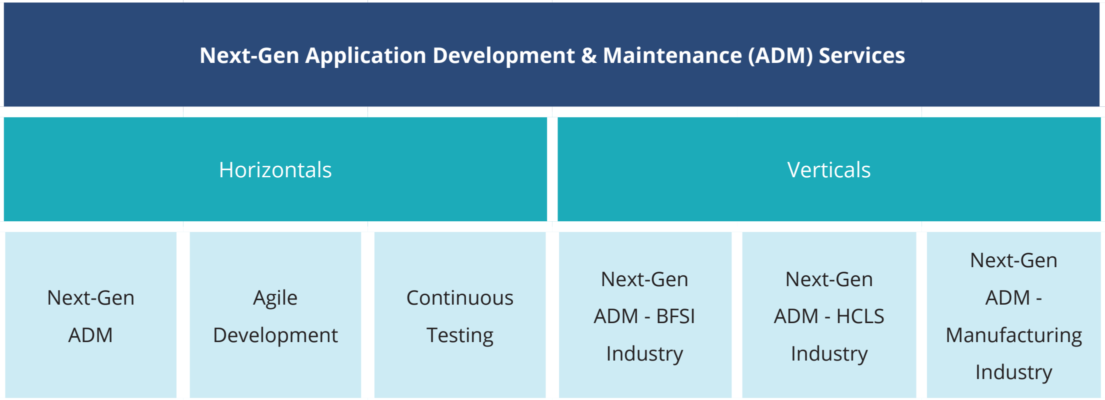
- **Omni-chain is disrupting supply chains:** Although in its infancy, there are instances where manufacturers are using a blockchain-based “omni-chain” model to connect different processes in the ecosystem. Omni-chain is a cloud model that unifies both internal and external processes across extended networks.

- **There is a rapid increase in enterprise cloud and mobility engagements:** Manufacturers are looking to leverage cloud and mobility to form a connected ecosystem of suppliers, manufacturers, customers and partners.



Introduction

Simplified illustration



Source: ISG 2018

Definition

Service providers are augmenting their traditional ADM offerings with emerging technologies and collaborative frameworks to meet their enterprise clients' objectives. ISG terms such contract types as next-gen ADM contracts. This study tries to understand the client objectives and assesses provider capabilities to deliver on next-gen ADM contracts.

Definition (cont.)

Scope of the Report

The following areas associated with next-gen ADM are included within this study:

Next-Gen ADM

Like traditional application services, next-gen ADM includes consulting, design, custom development, packaged software integration, operations and testing. However, the scope, delivery mechanism and outcome for such contracts pivot around a value-based approach where the focus is on achieving enterprise agility and solving business problems.

This quadrant assesses vendors based on their capability to augment traditional ADM services with emerging technologies and methodologies, like agile, DevOps, automation, digital and modernization techniques to deliver application outsourcing projects. It also assesses provider capabilities in incorporating new approaches to develop and deliver applications that focus on business outcomes.

Agile Development

Agile development focuses on an incremental and iterative approach to application development. Because agile encompasses frequent and early releases of the working software, it is being viewed by enterprise as a medium for attaining enterprise agility.

This quadrant assesses capabilities of a provider to deliver tangible results through use of various agile methodologies. It looks at the focus each provider has towards use of agile development with respect to its overall application development practice.

Continuous Testing

Continuous testing focuses on delivering quality assurance at speed. In terms of technology, it encompasses various aspects of automated testing such as shift-left, end-to-end automation across testing phases. However, in terms of people and processes, it goes a step beyond automation testing to accomplish higher collaboration among QA and development teams

Definition (cont.)

to sync with sprint cycles, feature-driven testing, responsiveness to change, creating a feedback loop and promoting greater client involvement. Continuous testing is gaining momentum, especially to help enterprises keep pace with their agile and DevOps initiatives.

Service providers for this quadrant are assessed on their progress made and capabilities developed for creating a continuous testing environment with measurable outcomes for their clients.

Next-Gen ADM – BFSI

This quadrant assesses the strength of providers that provide next-gen ADM services to BFSI industry vertical, which is comprised of banking, diversified financial and insurance companies.

Next-Gen ADM – HCLS

This quadrant assesses the strength of providers that provide next-gen ADM services to HCLS industry vertical, including healthcare institutions, payers, pharmaceutical, biotech and medical device companies.

Next-Gen ADM – Manufacturing

This quadrant assesses the strength of providers that provide next-gen ADM services to the manufacturing industry vertical, which includes conglomerates, capital goods, construction, consumer durables (like automotive, household appliances), aerospace and defense, materials, semiconductor, technology hardware and equipment companies.

Provider Classifications

The ISG Provider Lens™ quadrants were created using an evaluation matrix containing four segments, where the providers are positioned accordingly.

Leader

The "leaders" among the vendors/ providers have a highly attractive product and service offering and a very strong market and competitive position; they fulfill all requirements for successful market cultivation. They can be regarded as opinion leaders, providing strategic impulses to the market. They also ensure innovative strength and stability.

Product Challenger

The "product challengers" offer a product and service portfolio that provides an above-average coverage of corporate requirements, but are not able to provide the same resources and strengths as the leaders regarding the individual market cultivation categories. Often, this is due to the respective vendor's size or their weak footprint within the respective target segment.

Market Challenger

"Market challengers" are also very competitive, but there is still significant portfolio potential and they clearly lag behind the "leaders". Often, the market challengers are established vendors that are somewhat slow to address new trends, due to their size and company structure, and have therefore still some potential to optimize their portfolio and increase their attractiveness.

Contender

"Contenders" are still lacking mature products and services or sufficient depth and breadth of their offering, while also showing some strengths and improvement potentials in their market cultivation efforts. These vendors are often generalists or niche players.

Provider Classifications (cont.)

Each ISG Provider Lens™ quadrant may include a service provider(s) who ISG believes has a strong potential to move into the leader's quadrant.

Rising Star

Rising Stars are mostly product challengers with high future potential. When receiving the "Rising Star" award, such companies have a promising portfolio, including the required roadmap and an adequate focus on key market trends and customer requirements. Also, the "Rising Star" has an excellent management and understanding of the local market. This award is only given to vendors or service providers that have made extreme progress towards their goals within the last 12 months and are on a good way to reach the leader quadrant within the next 12-24 months, due to their above-average impact and innovative strength.

Not In

This service provider or vendor was not included in this quadrant as ISG could not obtain enough information to position them. This omission does not imply that the service provider or vendor does not provide this service.

Next-Gen Application Development & Maintenance (ADM) Services Cross-Quadrant Provider Listing 1 of 3

	Next-Gen ADM	Agile Development	Continuous Testing	Next-Gen ADM - BFSI Industry	Next-Gen ADM - HCLS Industry	Next-Gen ADM - Manufacturing Industry
Accenture	Leader	Not in	Not in	Not in	Not in	Not in
Atos	Leader	Product Challenger	Product Challenger	Product Challenger	Product Challenger	Leader
Capgemini	Leader	Leader	Leader	Leader	Leader	Leader
CGI	Contender	Not in	Not in	Not in	Not in	Not in
CI&T	Not in	Product Challenger	Not in	Not in	Not in	Not in
Cigniti	Not in	Not in	Contender	Not in	Not in	Not in
Cognizant	Leader	Leader	Leader	Leader	Leader	Leader
DXC Technology	Leader	Leader	Leader	Leader	Leader	Leader
EPAM	Contender	Product Challenger	Product Challenger	Contender	Product Challenger	Not in
Fujitsu	Product Challenger	Not in	Not in	Not in	Not in	Not in

Next-Gen Application Development & Maintenance (ADM) Services Cross-Quadrant Provider Listing 2 of 3

	Next-Gen ADM	Agile Development	Continuous Testing	Next-Gen ADM - BFSI Industry	Next-Gen ADM - HCLS Industry	Next-Gen ADM - Manufacturing Industry
HCL	Leader	Leader	Leader	Leader	Leader	Leader
Hexaware	Contender	Rising Star	Leader	Product Challenger	Contender	Not in
IBM	Leader	Leader	Leader	Not in	Leader	Leader
Infosys	Leader	Leader	Leader	Leader	Leader	Leader
ITC Infotech	Product Challenger	Product Challenger	Contender	Contender	Not in	Product Challenger
KPIT	Contender	Market Challenger	Contender	Not in	Contender	Contender
LTI	Rising Star	Product Challenger	Rising Star	Rising Star	Not in	Product Challenger
Luxoft	Not in	Product Challenger	Not in	Not in	Not in	Not in
Mindtree	Leader	Leader	Leader	Product Challenger	Not in	Product Challenger
Mphasis	Not in	Contender	Not in	Product Challenger	Not in	Not in

Next-Gen Application Development & Maintenance (ADM) Services Cross-Quadrant Provider Listing 3 of 3

	Next-Gen ADM	Agile Development	Continuous Testing	Next-Gen ADM - BFSI Industry	Next-Gen ADM - HCLS Industry	Next-Gen ADM - Manufacturing Industry
NTT DATA	Product Challenger	Not in	Product Challenger	Not in	Product Challenger	Not in
Softtek	Not in	Leader	Product Challenger	Not in	Not in	Not in
Syntel	Product Challenger	Not in	Not in	Not in	Not in	Not in
TCS	Leader	Not in	Not in	Not in	Not in	Not in
Tech Mahindra	Leader	Product Challenger	Contender	Leader	Rising Star	Rising Star
UST Global	Product Challenger	Product Challenger	Leader	Product Challenger	Contender	Contender
Virtusa	Product Challenger	Not in	Product Challenger	Leader	Not in	Not in
Wipro	Leader	Leader	Leader	Not in	Not in	Not in
Zensar	Not in	Not in	Product Challenger	Contender	Not in	Not in

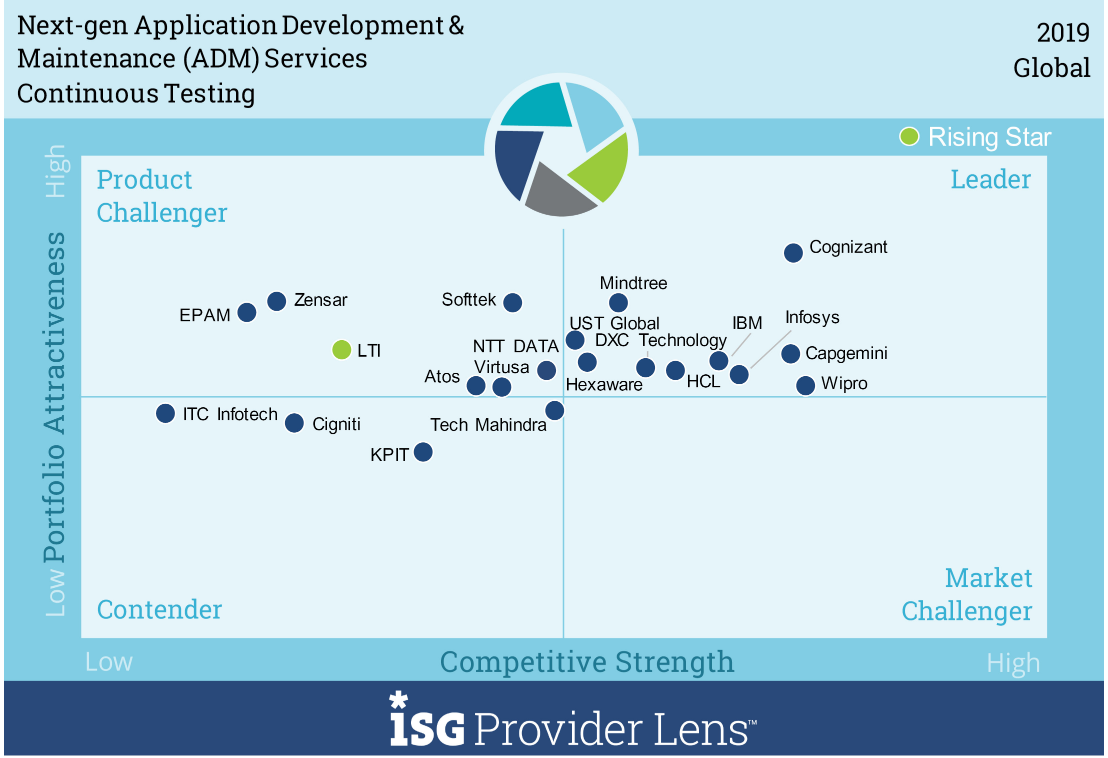
Next-Gen Application Development & Maintenance (ADM) Services Quadrants

CONTINUOUS TESTING

Definition

Continuous testing focuses on delivering quality assurance at speed. In terms of technology, it encompasses various aspects of automated testing such as shift-left and end-to-end automation across testing phases. However, in terms of people and processes, it goes a step beyond automation testing to accomplish higher collaboration among QA and development teams to sync with sprint cycles, feature-driven testing, responsiveness to change, creating a feedback loop and greater client involvement. Continuous testing is gaining momentum, especially to help enterprises keep pace with their agile and DevOps initiatives.

Service providers for this quadrant are assessed on their progress made and capabilities developed for creating a continuous testing environment with measurable outcomes for their clients.



Source: ISG Research 2018

CONTINUOUS TESTING

Observations

- Capgemini's core strength includes strong IP, industrialized delivery and a rich tool stack.
- Cognizant has been banking on its HiveCenter™ platform, pod-ready engineers and local delivery presence to win next-gen testing engagements.
- DXC's testing-as-a-service and intelligent automation offerings are some core differentiators.
- HCL has prebuilt accelerators and an upskilled workforce that is equipped to work on continuous testing projects of varying scope and size.
- Hexaware's in-house and partner-led solution development makes it a worthy contender to execute continuous testing projects.
- IBM's AI-enabled test services and home-grown automation tools give it a distinct advantage over competition.
- Infosys provides flexible contracting options, has specialized testing labs and is foraying into emerging areas to provide an array of next-gen testing services.
- Mindtree's experienced-based testing offerings and presence of cross-trained and full-stack engineers make it a specialist in this space.
- UST Global is banking on its alliances, tools, accelerators and acquisitions of specialist firms to compete and grow in this market.
- Wipro's focus on automation-led testing and its engineering approach towards newer testing techniques are its key differentiators.
- LTI's digital testing offerings and design-driven approach to testing earn it the Rising Star spot.

INFOSYS

Overview

Infosys generated revenue of nearly $1.4 billion from application testing services in 2017. Infosys Validation Solutions (IVS) is the company's quality assurance and testing practice. The IVS business unit contributed 12 percent of Infosys' top line and has maintained a 98 percent retention rate with existing clients.

Strengths

Quality assurance workbench: Infosys uses an AI-based, cloud-enabled "intelligent" assurance workbench that provides end-to-end testing services capabilities for digital enterprises and technologies. The workbench is integrated with the AI-led QA Suite, which is an in-house developed machine learning platform that helps in multiple phases of the software testing lifecycle, leading to more efficient execution and reduced effort.

Specialized testing labs: Infosys has built labs for specialized services in partnership with leading tool vendors such as Micro Focus, CA, Tricentis and Perfecto Mobile.

Capabilities in emerging areas: Infosys has developed capabilities for testing machine learning, crowd testing, IoT testing, DevOps and cloud.

Flexible contracting: Besides resource-based pricing, Infosys offers its Test Unit Estimation model specifically for functional testing. It also uses alternative contracts, like output- and outcome-based pricing models.

Caution

Infosys can further expand and enhance its security testing offerings. It also can look to train its current testing resource base across test automation tools and frameworks.

2019 ISG Provider Lens™ Leader

Infosys is an ideal choice for clients looking to run their testing operations in a managed mode with full lifecycle management. It also provides flexibility to contract through innovative and flexible models.

Methodology

METHODOLOGY

The research study “ISG Provider Lens™ 2018 – Next-Gen Application Development & Maintenance (ADM) Services” analyzes the relevant software vendors/service providers in the Global market, based on a multi-phased research and analysis process and positions these providers based on the ISG Research methodology. The study was divided into the following steps:

1. Define the “Next-Gen Application Development & Maintenance (ADM) Services” market

2. Conduct questionnaire-based surveys with service providers/vendor across all trend topics

3. Hold interactive discussions with service providers/vendors on capabilities and use cases

4. Leverage ISG’s internal databases and advisor knowledge and experience (wherever applicable)

5. Analyze and evaluate services and service documentation based on the facts and figures received from providers and other sources.

6. Evaluate based on the following key criteria:
   - Strategy and vision
   - Innovation
   - Brand awareness and presence in the market
   - Sales and partner landscape
   - Breadth and depth of portfolio of services offered
   - Technology advancements

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Ashish Chaturvedi has approximately eight years of experience spanning IT sourcing, technology and industry research. In his current role, Ashish is responsible for authoring service provider intelligence studies, including Provider Lens Archetype and Quadrant reports, covering the application development and maintenance (ADM) services market. He has authored several thought leadership papers, blogs and research briefs in the realms of enterprise applications, automation and Big Data. He is also a member of the IDG Influencer Network CIO.com).

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