Provider Lens™
Next-Gen Application Development & Maintenance (ADM) Services
Continuous Testing
Global 2019 Quadrant Report

A research report comparing provider strengths, challenges and competitive differentiators

Customized report courtesy of:

Mindtree

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About this Report

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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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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**

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.
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

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

Capgemini's 2017 global revenue from application testing was approximately $1 billion. Of this, almost 75 percent of the revenue was constituted by non-traditional testing services. Capgemini provides testing services to almost 500 enterprise clients.

Capgemini is looking to enhance its capabilities in area of open-source technology, cloud, virtualization, artificial intelligence and BOTS.

**Strengths**

**Strong IP:** Capgemini’s proprietary tools, including SmartQA, intelligent Test Automation Platform (iTAP), SmartFoundry, SmartAnalytics and NFT Hub, help bring value across different testing stages by ensuring both agility and quality.

**Industrializing testing:** Through use of practices like SAFe and lean, Capgemini is attempting to industrialize early testing phases across the portfolio and individual programs. This is achieved by introducing early and continuous tests in parallel with development, leveraging test-driven development and behavior-driven development methods.

**Tool stack initiatives:** Capgemini is redesigning its tools stack to make the tools more conducive to continuous testing practices. A few major changes include building and deploying functional layers over industry tools and API-based testing solutions development for easier integration with new development.

**Caution**

The majority of Capgemini’s testing clients belong to the BFSI industry. It does have clients in other industries, like energy, telecommunication, CPG and healthcare, but the penetration remains low.
Cognizant has almost 150 clients globally. Cognizant's overarching vision for quality assurance (QA) is to assure its clients' success in the digital economy by bringing together deep industry and technology expertise to drive quality at speed.

**Strengths**

- **Automation-as-a-continuum**: Its HiveCenter™ model, an integrated portfolio of services, platforms and solutions, addresses automation holistically, including continuous testing.

- **Workforce transformation**: Cognizant is investing heavily to incubate "pod-ready" quality engineers that can architect and deploy continuous testing solutions.

- **Delivery support**: Cognizant has more than 50 development centers, 10 digital assurance labs and other resources for localized QA delivery.

**Caution**

Most of the QA tools and platforms Cognizant has developed are industry-agnostic, with exceptions for healthcare and, to some extent, the financial industry. The company could invest more to develop industry-specific IP to increase its win rate for contracts that require deep vertical expertise.

**2019 ISG Provider Lens™ Leader**

Application testing is one of Cognizant’s core strengths and acts as an enabler for undertaking and executing large DevOps and digital transformation contracts.
In 2017 DXC generated revenue of approximately $1 billion from testing services, 75 percent of which was generated from continuous testing services. It serves 500 enterprise clients from 40 delivery centers globally.

DXC testing has been positioned as an enabler for its customers’ digital transformation journey, where customers are modernizing and transforming their business applications, moving to cloud, securing their business and end-user data and diversifying their business outreach by leveraging multiple channels.

**Overview**

**Strengths**

**Testing-as-a-service (TaaS):** DXC’s TaaS is a flexible, consumption-based testing service in a pay-as-you-go model. Some of the services offered under TaaS include functional and automation testing (FTaaS), performance testing (PTaaS) and mobile testing (MTaaS).

**Intelligent automation:** DXC’s intelligent automation solution not only addresses testing, but also provides end-to-end automation across the DevOps lifecycle.

- Clients can select open-source and enterprise testing tools to configure an end-to-end integrated tool suite based on their preferences. The automation platform is provided in the cloud as well as on-premise.
- The automation solution is reusable and integrates UI, headless and mobile test frameworks across the enterprise.
- It enables manual and automated script creation in parallel.
- It enables automation prior to development completion.

**Caution**

DXC needs to further expand its next-gen testing offerings around areas such as AI, machine learning, DevSecOps and analytics.

DXC is strong in specialized services and can be a partner of choice for testing division overhaul, cloud-based as-a-service expertise, global managed services contracts and contracts requiring industry expertise.
Continuous Testing

HCL

Overview
HCL’s 2017 global revenue from application testing was approximately $600 million, nearly 40 percent of which came from continuous testing projects. It caters to almost 105 clients globally.

HCL strongly believes that transformation to continuous testing needs to focus on two aspects – people and tools. An existing QA team needs to be reskilled to support automation and the tools landscape needs to be reworked to support overall SDLC integration.

Strengths
Upskilling of QA FTEs: To meet growing needs of digital transformation and creating an environment suitable for agile and DevOps implementations, HCL has invested in technical tester and digital tester academies to train and upskill its current workforce.

Products and platform: HCL is focusing on innovative IP-led transformation. For example, through its 15-year IP partnership with IBM, HCL is uniquely positioned to offer alternate consumption and commercial models for its enterprise customers.

Tools and accelerators: HCL prebuilt solutions such as i-ADOpT, NexGen and Digital Automated Assurance, its specialized test suite and UBOT-enabled automation. Digital, cognitive and performance testing services and are part of its transformation roadmap for enterprises to achieve fixed benefits.

Caution
HCL can further strengthen its as-a-service, microservices-based testing and non-functional automated testing offerings.

2019 ISG Provider Lens™ Leader
HCL has a consulting-led approach focused on collaboratively identifying goals, managing change, coaching and implementing continuous testing solutions with assured benefits.
HEXAWARE

Overview

Hexaware served 50 testing clients in 2017 and its global revenue from application testing was approximately $121 million, nearly half of which came from continuous testing projects.

The continuous testing practice at Hexaware has more than 50 consultants with average experience of more than five years in deep CT practices. It can coach clients with on-site or immersion “training on the job” requirements.

Strengths

Partner-led solution development: Hexaware works with vendors such as Conformiq, Smart Software Testing, Sealights, Plutora, CA and Tricentis to improve and integrate their products with its own solutions.

In-house solution creation: Some of the key in-house solution developed by Hexaware include a continuous assurance platform and Integrated Design to Execution (iD2E) Platform. These platforms are used to enable continuous testing, progression/in-spirit test automation and multichannel automation across thin client applications (browser-based applications), thick client applications (.Net, Java, Delphi, etc.), mobile test automation (iOS, Android and Windows) and API test automation (ESB, SOA and MSA applications). As part of CAP, there are out-of-the-box plug-ins available for different automation solutions to integrate with different CI tools like Jenkins, Bamboo, etc.

Hexaware served 50 testing clients in 2017 and its global revenue from application testing was approximately $121 million, nearly half of which came from continuous testing projects.

The continuous testing practice at Hexaware has more than 50 consultants with average experience of more than five years in deep CT practices. It can coach clients with on-site or immersion “training on the job” requirements.

2019 ISG Provider Lens™ Leader

Hexaware’s pursuit of partner-led solution development, its skilled resource pool and complementary next-gen offerings make it a good fit for enterprise customers looking to achieve enterprise agility to gain a competitive advantage.
IBM

Overview

IBM has approximately 30,000 FTEs engaged in testing worldwide and 1,000 testing services clients. Around 25 percent of its testing revenue came from continuous testing in 2017.

Strengths

IBM IGNITE quality and test services: IGNITE is an AI-enabled framework that expedites from error detection to error prevention at increased speed, quality and cost savings. There are three stages to this framework: Optimize (which has reduced number of tests by up to 88 percent), Automate (which is a testing process automation that reduces up to 99 percent of defects) and Analyze (which is a pattern identification to prevent future errors).

Alignment of automation tools/frameworks with CT-enabling technologies: Examples include ConformIQ and IBM Combinatorial Test Design (FOCUS) for test modeling and test optimization, and IBM InfoSphere® Optim™ test data management, which is used to optimize and automate processes that create and manage non-production environment data.

Strong in emerging areas: IBM has strong capabilities around cloud-based testing and leveraging Watson's cognitive capabilities for adaptive testing and decision-making.

Caution

Although IBM has clients across contract bands ranging from $1 million to more than $20 million, it may not be suitable for simpler testing projects given its higher price points.

2019 ISG Provider Lens™ Leader

IBM has a fairly comprehensive software testing portfolio. It is an excellent choice for large clients that require support from multiple locations and across multiple technologies.
**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.

**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.

**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.
MINDTREE

Overview

Mindtree's 2017 application testing revenue was nearly $150 million, 60 percent of which was contributed by continuous testing services. Mindtree has approximately 1,650 testers supporting 27 enterprise clients globally.

Mindtree's continuous testing strategy is based on two principles: “automation across test life cycle,” including “test-as-you-build” and “fail-fast,” adopting shift-left concepts to ensure “prevention before detection.”

Strengths

Full-stack and cross-trained resources: Mindtree is aggressively upskilling resources on continuous testing concepts and tools. It is looking to train resources across the testing value chain from back-office to front-office testing. Testers are being trained on concepts like user experience, analytics and more. Testing is being executed through Mindtree’s YORBIT virtual learning platform and classroom sessions.

Proprietary tooling: Mindtree has invested heavily to develop differentiated testing offerings that are in tune with today’s dynamic test environment. Its major assets include the Dynamic Test Engineering Platform (DTEP), a unified platform for continuous testing that provides centralized access to several other proprietary resources and accelerators, and MIST, a complete scriptless end-to-end unified automation framework to enable faster script development and test execution for web, desktop and mobile.

Agile QA Transformation Experience (ATX): ATX is a new test consulting offering by Mindtree. This framework helps clients in their transformation journey by defining an operating model to suit waterfall and agile/DevOps process guidelines for continuous testing, behavior-driven development, test-driven development or acceptance test-driven development, as appropriate.

Caution

Mindtree should invest in creating more vertical-specific accelerators and tooling. There is also huge scope for enhancing its offerings in areas like application security, cognitive and cloud testing.

2019 ISG Provider Lens™ Leader

Mindtree plays across the testing continuum with its well-crafted set of automation offerings backed by a continuously evolving resource pool of full-stack engineers.
**Overview**

UST Global's 2017 testing services revenue was approximately $90 million, 60 percent of which was brought in by continuous testing.

It caters to the BFSI, high-tech, healthcare and retail industries with a focus on test automation, test data management and performance and security testing.

**Strengths**

**Leveraging alliances to attain efficiency:** UST Global uses different alliances at various phases of testing to effectively meet customer demands. For example, it leverages Tricentis’ Tosca for continuous testing and automation, CA Agile Designer for test design automation, Neotys’ NeoLoad for performance testing, Plutora for test environment management and GenRocket for test data management.

**Accelerators and tooling:** UST Global has developed accelerators for different testing types. A few examples include NoSkript (a script-less tool for automation), U-Perform (for accelerating performance test planning and design), XZAP (for security testing) and a defect classification engine developed on UST’s machine learning and analytics platform ICE. It also has SOAF (an in-house SOA test automation framework), CIGAR (a real-time metrics dashboard) and SMART Testing (a tool used for risk-based test coverage and test predictability).

**Acquisitions to gain expertise:** In the past 5 years, UST has acquired a few niche-yet-technologically-rich companies operating in the testing space. These include acquisition of Xpanxion and Testhouse Consultores S.A.

**Caution**

Most of UST Global’s testing engagements are less than $5 million in size. Thus, its revenue base is bottom-heavy and should be mostly considered for mid-size testing assignments.
Wipro

Overview

Wipro's application testing revenue was $1.8 billion in 2017. 42 percent came from continuous testing.

Wipro offers continuous testing as a comprehensive solution in association with DevOps or as a standalone solution, according to the customer's requirement.

Strengths

Automation-led testing: Wipro has made investments in automation to develop tools that can automate and accelerate the testing environment and maintain quality. Two of the primary tools include NXT, a next-generation QA delivery hyper-automation platform applicable across the testing lifecycle, and Assure, a next-generation IT wellness platform designed to improve predictability in application quality, reduce cost of quality and build self-healing quality processes. Wipro has been able to automate more than 60 percent of tasks across test phases.

Continuous testing assessment and strategy: Wipro provides assessment of current state of assurance for continuous testing transformation using continuous testing maturity model (CTMM) and developing a roadmap and strategy.

Continuous testing for DevOps using behavior-driven development (BDD): Wipro is engaged in building an engineering approach for continuous testing using BDD.

Caution

Wipro has been on the conservative side when it comes to putting skin in the game. Wipro doesn't have any outcome-based or gain-share deals with respect to their testing business.

2019 ISG Provider Lens™ Leader

Wipro's heavy investments in automation and IP development, skilled resource pool and complementary next-gen offerings make it a good fit for large customers looking to achieve enterprise agility to gain a competitive advantage.
RISING STAR: LTI

Overview

LTI's Assurance Unit contributed to 8 to 12 percent of LTI's overall revenue in 2017. LTI has approximately 2,500 testers serving 84 enterprise clients. Continuous testing accounts for around 53 percent of overall testing revenue.

LTI's proprietary tools and technology-agnostic Assurance platform enables in-sprint extreme automation, thereby, bringing efficiencies in 'continuous testing' and enabling 'continuous delivery'.

Strengths

**DiCE digital customer experience solution**: DiCE helps clients to reimagine their experience and transform the way they deliver end-to-end customer experience. It uses mind-wave mapping to understand the end user's feelings and shares a competitive score across five dimensions, covering around 120 parameters.

**Institutionalized Design-driven Delivery (3D)**: 3D is LTI's agile-based approach to building innovative solutions. 3D complements continuous testing practices like Scrum and XP by infusing innovation, design and usability to overall software development and testing. It builds early automation and efficiency techniques into the test process so cost avoidance measures and strategies to improve the failure rate can be devised.

**PLATO end-to-end business lifecycle assurance solution**: PLATO aims to reduce the overall testing cost, improve test effectiveness and achieve economies of scale. It helps automate the entire business lifecycle and can seamlessly integrate with industry tools, custom solutions and LTI's proprietary tools to achieve faster DevOps deployments.

**Focus on AI**: Glassbox is LTI's proprietary AI and natural language processing (NLP)-driven solution. It helps analyze historical data to deliver smart insights with respect to areas impacted due to defects. It also facilitates better planning for future releases with predictive defect data and increases collaboration between the development and testing teams.

Caution

Although LTI has demonstrated impressive results through its proprietary tooling in testing, its client penetration remains low. One of the major reasons is that a large amount of its existing business still comes from staff augmentation, where solutioning is not part of the overall SOW.

**2019 ISG Provider Lens™ Rising Star**

A strong digital testing practice make LTI an attractive alternative to large multinational providers for managed testing contracts, especially with agile/DevOps elements in scope.
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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