



Trust. Value. Velocity

G-Cloud 15

Regression Testing Service

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1. About Mastek

Mastek has been delivering Critical National Infrastructure programmes in the UK Public Sector for over a decade now. We are trusted with multiple contracts for the UK Government across Central Government, Health, Local Government, Policing, Public Protection and Defence. The majority of our national services are delivered in a context of high uncertainty and complexity while collaborating in multi-supplier environments.

While working for these large and complex public sector organisations, we have continuously refined our management, delivery and underlying processes to reflect key learnings from the sector:

Working through a complex stakeholder landscape: We understand the importance of establishing effective communication channels, building trust and fostering a collaborative working environment that empowers stakeholders to contribute meaningfully to the project's success. Our approach is based on a deep understanding of stakeholder needs and requirements. We leverage our experience and expertise to design governance structures that promote transparency and accountability and use data-driven reporting mechanisms to ensure stakeholders have real-time visibility into project status and progress. At the Home Office, GDS, Ministry of Defence and NHS, we have a proven track record of working seamlessly with large stakeholder groups, including civil servants.

Standards, compliances: We comply with >20 policies and standards, including Government Digital Standards and Government CDDO Service Toolkit covering service standards, service manuals, TCoP, API technical and data standards. Our stringent governance, methods, playbooks and processes (manual and automated) span across service delivery phases, ensuring continuous compliance.

Policy-driven: Policies and procedures largely drive Public Sector organisations. We need to be Agile and flexible to meet demands for policy/regulatory changes, geopolitical events and ministerial commitments.

Culture: We adhere to the Civil Service core values of integrity, honesty, objectivity and impartiality. Key behaviours we promote stem from a combination of Civil Service and Mastek values. These include being passionate, accountable, sustaining predictable and repeatable outcomes, not transferring risk, transparent, leading to enable, acting with transparency, practising a no-blame culture and being flexible.

Mastek's global presence



Australia

Austria

Bahrain

Belgium

Brunei

Canada

Denmark

Egypt

Estonia

Finland

France

Germany

Hungary

Iceland

India

Indonesia

Ireland

Italy

Japan

Jordan

Kenya

Kingdom of Saudi Arabia
(KSA)

Kuwait

Latvia

Luxembourg

Malaysia

Netherlands

New Zealand

Norway

Oman

Philippines

Poland

Romania

Singapore

Slovakia

Spain

Sri Lanka

Sweden

Switzerland

United Arab Emirates (UAE)

United Kingdom

USA

Did you know?

75%

Around three quarters of Local Authorities in the UK who run Oracle have worked with Mastek on their digital transformation journey.

300,000 Users

Supported managing up to 750,000 logins per month to MOD through Identity and Access Management

Crime reduction

We designed, built and manage the UK's Strategic National DNA Database that helps Forensics and Law Enforcement Authorities investigate and stop crime

90% faster

We enabled the National Health Service (NHS) to drive 90% faster response times with a billion pharmacy prescriptions a year.

Technical Service Desk

We provide level 2 and ITSM support for the One Login service at Government Digital Service

22k

Our systems enable 22,000 schools to function efficiently every day of the year.

Healthcare and manufacturing

We delivered Finance, HCM and Supply Chain transformations for clients across health and manufacturing globally powered by Oracle Cloud

Transformation of trade

Transforming UK's trade with the EU and rest of the World by supporting Customs Declarations Services and its trade users.

99.99% Availability

We support the Home Office Biometrics (HOB) Platform, Having migrated it to an AWS platform.

Our digital and cloud services portfolio

Powered by Glide 4.0 and value-based delivery

Industry-aligned approach with business outcomes

Digital engineering and experience	• Cloud engineering and migration • Legacy modernisation • Low code / no code App Dev • DevSecOps • Enterprise integration	• MACH • Digital commerce • UX and CX • Platform engineering • Gen AI software development.
Oracle Cloud and enterprise apps	• Oracle Cloud applications • Oracle consulting • Oracle Cloud infrastructure	• Value-based delivery • Glide 4.0.
Data, automation and AI	• Cloud data modernisation • Business Intelligence and Analytics	• Data management • Intelligent automation • Data Governance.
Salesforce	• Sales Cloud • Service Cloud • Marketing Cloud • Industry Cloud	• Experience Cloud • Mulesoft.
Innovation labs and platforms	• Enterprise workforce scheduler • Connected enterprise • icx-Pro – intelligent part assistant	• iLeaseFinPro.
Cloud enhancement managed services	• Oracle managed services • Digital managed services • Commerce managed services	• Salesforce managed services.

Home Office Biometrics (HOB)

Public sector platform modelled 24x7 with 99.99% availability

Problem

- Transition business-critical Platform services from incumbent supplier with minimal risk
- Migration from private cloud to AWS Cloud.

Solution

- Migrated the infrastructure from private cloud to AWS
- Embedding Kubernetes Containerisation
- Introduced Docker and fully-baked AMIs
- Supporting the platform's self-service functionality using Jenkins Jobs
- Applying security updates to the OS base images through pipelines
- Instituting automated patching and testing for infrastructure images
- Support of configuration, test and releasable artefacts through the pipeline.

Outcome

- **Zero impact** on live service
- **80% automation** of SIT
- Environment Provision **2 days to 1 hour**
- **5x scalability** in handling student BRPs
- Cost saving the authority circa **£9.5m/year.**
- Won the '**Best Use of Cloud Services**' award
- **35%** Incident Volume Reduction.



Government Digital Service

Problem

GDS initiated the One Login programme to create a single front door for identity verification and authentication, which could be adopted and scaled across all government departments. This would improve the user experience by providing the public with a single identification and verification service for the government, reduce costs as each department no longer required its own identity service and reduce identity fraud and identity-enabled crime.

GDS released a tender in June 2023 to provide a Technical Service Desk (TSD) managed service for the One Login service. This service would provide a single point of contact for level 1 and 2 service support as part of the wider support ecosystem. It would be provided in the UK and replace the incumbent's scaled-down non-ITIL-aligned break-fix service.

Solution

In September 2023, Mastek were successfully awarded the TSD contract to deliver TSD on behalf of GDS. GDS had an extremely aggressive programme driven by the onboarding of HMRC as a user, which was a major milestone planned for February 2024, migrating new and existing HMRC users to the One Login platform. The TSD service was expected to go live in November 2023. This was an extremely complex programme which, within this timescale, would deliver:

- The contact centre provider for level 0 directly facing the public
- The TSD supplier in place directly facing all government departments
- The TSD supplier in place providing L1 and L2 engineering support and monitoring
- Continued delivery on the One Login backlog of features
- Continued migration of smaller government departments to the platform.
- Delivery of a new ITSM toolset to be configured for use by GDS and the One Login programme, integrating level 0 to level 3 support
- Working as one team, Mastek quickly integrated into the programme, appointing the leadership team early in the engagement. We collaborated with GDS from the outset, ensuring we tailored the service to their expectations rather than delivering what was written in the contract.

Our leadership team consisted of:

- Service Management Vice President
- Programme Director
- Chief Technology Officer
- Programme Management office lead.

Outcome

At its height, the programme team was circa 15 strong, covering programme/project delivery, PMO, architecture, fraud, security, support, omni-channel and quality assurance. The service team is currently in place providing circa 21 resources now covering end-to-end service management, service delivery and L1 and 2 engineering roles.

As the One Login migrations continue, Mastek is supporting Government departments onboarding to the platform as they transition into the new service and provide One Login a secure Technical Service Desk managed service with:

- Omni channel access for other government departments via telephony, email and web form
- Provision of L1 and L2 engineering support
- 24x7, 365 days a week cover
- 24x7x365 eyes on monitoring service
- Fraud detection and security, GDPR compliant
- End-to-end (L0-3) incident and problem management
- End-to-end 24x7 Major incident management (MIM)
- On-call/call-out engineering support, incident and MI management
- Adherence to stringent SLAs on incident response, call handling and fix times
- End-to-end monthly service reporting alongside TSD KPI and SLA reporting.
- A shift left culture and mindset, reducing the impact of service on product teams (L3)
- Support with service maturity in the programme, preparing GDS to run critical national infrastructure.



Internet-facing platform and applications for Army Digital Services

Developed mobile app and web app with 24*7 high availability

Problem

- New Defence Gateway Portal
- Combine all internet-facing applications into one
- Easy to use
- Enable easier access to the MySeries portfolio of products.

Solution

Designed and developed the following easy-use Progressive Web Apps:

- Defence Gateway Landing Page
- My Leave App
- My Expenses App
- My Health App
- My Details App
- My Appraisal App
- My Admin App
- COVID-19 Reporting Tool
- Commanders' COVID-19 Tool.

Outcome

- Delivered 20+ successful projects
- Deployment Automation
- £7.5m in savings annually
- Zero Downtime
- Environment creation in hours.



Delivered a platform for the Department for Health and Social Care

Delivered capability supporting 200k+ tests in a day,
traced millions of COVID-19 infections

Problem

- Leveraging DevOps platform based on reusable GitHub, AWS and Azure DevOps Pipelines
- Introduce more flexible, scalable and reusable IaC capabilities
- Implement CI/CD pipelines.

Solution

- Uplifted from Cloud Formation into Terraform (IaC)
- Pre-built the AMIs using Packer, with automated security checks
- Immutable infrastructure, thus eliminating the risks of partial upgrades and patches
- Continual Cost Optimisation processes and other service functions, such as Change and Risk management
- Migrated into an organisation-wide collaboration toolset. This included Jira, Confluence, Trello, Miro, Teams, SharePoint, O365, Slack, etc.

Outcome

- 75% reduction in lead time due to pre-built AMIs
- Zero Downtime Deployments
- Delivered a Platform - Secured, multi-tenanted hosted on Azure and AWS in 5 weeks
- Cost reduction achieved through close monitoring of resource utilisation.



Mastek and Technology in the Public Sector

Technical Capabilities	Relevant Technology Capability	Mastek Scale
Software Development Continuous Integration, Platform - Other Products, Cloud Collaboration Tools		Software Engineering 2354 FTE
QA and Test; API, Automated Functional and Compatibility, Accessibility & Performance		QA and Testing 774 FTE
Cloud Platforms Amazon Web Services AWS Microsoft Azure		Cloud Platforms 1046 FTE
Data BI/MI Components, Integration		BI and Visualisation 725 FTE
User-Centered Design		UCD 25 FTE
Office Automation Tools		Collaboration 4565 FTE

2. Summary

Mastek delivers **Regression Testing** for traditional and cloud applications using AI-driven test design, automation frameworks and modern methodologies.

Our proven strategies mitigate risks associated with code changes, patches and enhancements, ensuring stability across both functional and non-functional aspects.

We safeguard application stability after code changes, ensuring new features and fixes do not disrupt existing functionality. AI-enabled automation reduces regression cycle time by up to 40%.

3. Masteks Service

Our approach supports Agile, CI/CD and continuous testing practices for rapid feedback and scalability. An effective Regression Suite ensures that critical functionality remains intact and working as expected and that no existing functionality is broken due to new changes.

A well-planned, well-defined and effective regression testing service can ensure smoother delivery into production. We combine AI-driven automation and selective manual techniques to ensure that existing functionality remains intact across releases. Mastek provides Regression Testing services at multiple levels. Regression packs are continuously optimised using impact analysis and automation accelerators for faster execution.

Our regression testing service includes:

- Component integration testing.
- System testing.
- System integration testing.
- Database-level regression testing.
- Security regression testing.
- Platform upgrades.
- Technical refresh.
- Acceptance testing.
- Automated regression suite.

3.1 Approach

Regression testing becomes critical when continuous modifications or enhancements are made to the working application or product. These changes or improvements should NOT introduce new issues in the existing, tested code or disrupt the functioning of existing code. It is, therefore, essential to identify the right set of test cases to be executed on every new software version.

Regression test packs are identified based on impact analysis results, including the criticality of functionality, complexity and associated risks. The regression test pack is updated regularly to accommodate core functionality added or enhanced to provide optimal coverage.

The selection of a particular regression technique/approach depends on the business needs:

- Selective test technique:
 - In this approach, we would assess the entire list of test cases used to test the software, identify the priority cases and functionality coverage, identify dependencies, areas prone to errors, etc. and determine a subset of test cases.
- Complete test technique:
 - All test cases are regressed for subsequent runs. This may become difficult to run for minor changes if not automated. Automation provides many advantages to this regression testing strategy.

Regression testing gives quick and effective results through automation. All the selected test cases are automated for execution and capturing test results. Automated suites/packs can be triggered for execution during non-working hours and analysed for discrepancies. These provide quicker results and the regression pack can be more effective and efficient.

Automation frameworks enable overnight execution and quick feedback, accelerating release cycles by 15–20%

4. Key Features

- **Comprehensive test management:** End-to-end regression test management, including strategy, prioritisation and defect reporting:
 - Test strategy and planning: We collaborate with stakeholders to define a comprehensive regression testing strategy aligned with project goals and identify critical functionalities for testing.
 - Test case selection and prioritisation: Our experienced testers identify and prioritise critical test cases that comprehensively cover core functionalities most susceptible to regressions.
 - Defect tracking and reporting: Identified regressions are logged and communicated effectively to developers for prompt resolution. Detailed regression test reports offer valuable insights into test coverage, identified defects and the overall stability of the application.
- **Close liaison with development teams:** We maintain open communication channels to understand code changes, assess potential regression risks and ensure efficient issue resolution.
- **Extensive expertise in complex regressions:** Our skilled testers possess in-depth knowledge to handle intricate, critical and elaborate regression testing scenarios, ensuring thorough verification even for complex applications.
- **End-to-end regression testing:** We conduct comprehensive end-to-end regression testing to cover critical business flows across integrated systems, guaranteeing seamless functionality throughout the user journey.
- **Continuous regression test suite maintenance:** Our services include updating and refining regression test suites to reflect evolving functionalities and application changes.
- **Flexible testing approach:** We offer both manual and automated regression testing approaches, tailoring the mix based on project requirements and test case complexity.
- **Faster ROI on automation:** Our in-house frameworks deliver 30-40% effort savings and faster ROI.
- **Risk-based regression testing:** We implement a risk-based approach, prioritising regression testing efforts based on potential impact on quality and client-specific time constraints. This ensures optimal resource allocation and focuses testing on key risk areas. Focuses effort on high-risk areas, reducing cost and improving coverage.
- **Modular and release-level testing:** We create and maintain regression test packs at both the module and release level, providing granular control over the testing scope and enabling efficient verification of specific changes.

5. Business Benefits

By partnering with Mastek for Regression Testing Services, you unlock a multitude of benefits that enhance the quality, efficiency and user experience of your software releases:

- **Improved software quality:** Our regression testing services directly contribute to improved overall software quality by proactively identifying and rectifying regressions before they reach production. This translates to a more stable and reliable application for your end users.
- **Increased end-user confidence:** By delivering high-quality, regression-free software, you foster greater user confidence and trust in your application.
- **Reduced time to market and better quality insights:** Efficient regression testing enables faster feedback loops, allowing you to identify and address issues early in the development lifecycle. This translates to quicker time to market and valuable insights into overall software quality. Accelerates delivery by 15-20% through efficient regression cycles.
- **Lower maintenance costs:** Early detection and resolution of regressions through regression testing minimises the need for costly rework and post-release maintenance efforts.
- **Enhanced efficiency through automation:** Automation reduces repetitive effort, minimises human error and saves 30-40% costs.
- **Experienced testers:** Our team comprises skilled regression testers with expertise in various testing methodologies and automation frameworks.
- **Agile and adaptable:** We tailor our regression testing approach to seamlessly integrate with your development lifecycle, Agile, Waterfall, or hybrid model.
- **Domain knowledge:** We leverage domain expertise to identify regression risks specific to your industry and application type.
- **Scalable testing Infrastructure:** Our robust testing infrastructure ensures efficient regression test execution even for large and complex applications.
- **Cost-effective solutions:** Our in-house automation frameworks and the option of off-site resource deployment can significantly reduce testing costs compared to building and managing your own internal testing team.

6. Technologies, Languages and Methods

#	Technologies	Languages	Methods
1	Test Automation Frameworks: Selenium, Cypress, Appium, Playwright, etc.	Python, Java, JavaScript, C#	Black-Box testing
2	Test Management Tools: Jira, Azure Boards, TestRail, HP ALM (Quality Centre).	-	Agile testing
3	Defect Management Tools: Jira, Azure Boards, Bugzilla, Trello.	-	Shift Left
4	Test Case Generation Agent	React App	Agile testing
5	Automation Starter Script Generator	React App	Agile testing
6	AI and MCP-based Intelligent Test Automation	React App	Shift Left

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