



Trust. Value. Velocity

G-Cloud 15

System Integration Testing (SIT) 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:

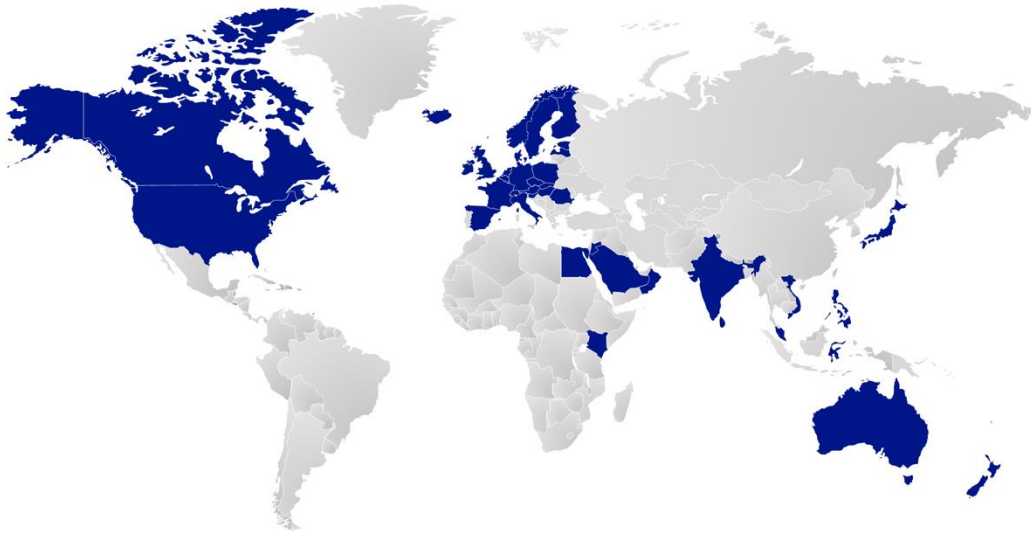
Working through a complex stakeholder landscape: We understand the importance of establishing effective communication channels, building trust and fostering a collaborative working environment that empowers stakeholders to contribute meaningfully to the project's success. Our approach is based on a deep 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

System Integration Testing (SIT) validates end-to-end functionality across integrated systems, ensuring seamless data flow, interoperability and compliance with business requirements.

Mastek leverages AI-driven automation, domain expertise and modern tools to deliver SIT across traditional and cloud platforms. Our approach ensures the accurate validation of both functional and non-functional requirements, adherence to compliance and early defect detection, thereby reducing costs and accelerating delivery.

3. Masteks Service

Our SIT strategy integrates risk-based prioritisation, automation accelerators and CI/CD pipelines for faster feedback and improved coverage. Mastek's System Integration Testing Services include an application validation process, involving end-to-end verification of applications. This process focuses on identifying and resolving defects as early as possible through a well-planned, comprehensive and integrated system testing strategy. We apply advanced techniques and automation to uncover hidden integration issues early, minimising production risks.

Our key focus for SIT is to authenticate the system's ability to function according to business specifications, in sync with other systems and within the targeted environment, while ensuring seamless coordination, integration and data flow across multiple subsystems of an application remain consistent and unfailing.

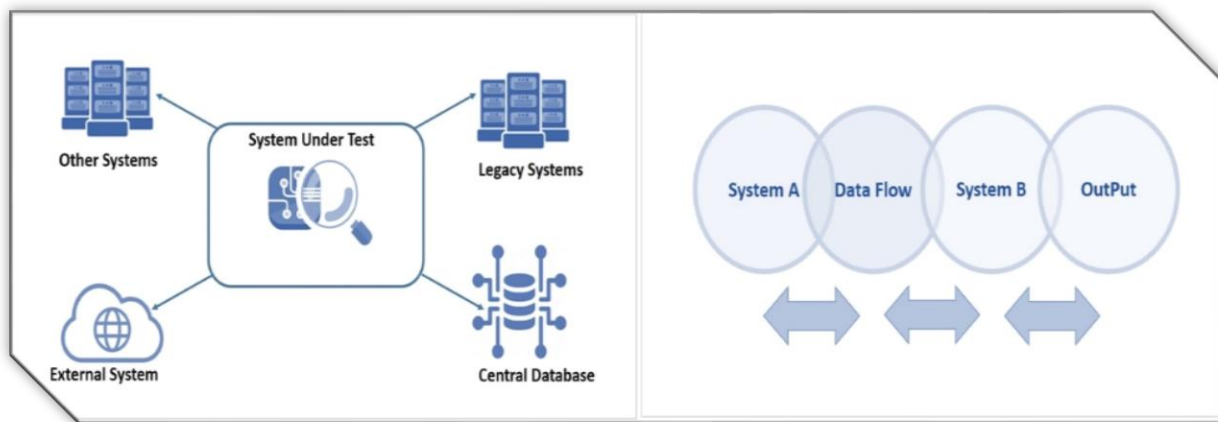


Figure 1: End-to-end system integration testing to ensure quality is consistent throughout integration

We offer SIT as a package, which includes skilled testers with broad vertical expertise, necessary tool expertise, knowledge of agile testing practices and modern testing infrastructure.

Our system integration testing includes the following:

- Functional flow validations across systems.
- Exhaustive positive and negative flow testing running through integrated systems.
- Verification of all workflows and alerts across systems.
- Integration between new and existing interfaces.
- Report format validation and batch processes.
- Verification of the synchronisation of the core system database with peripheral systems.

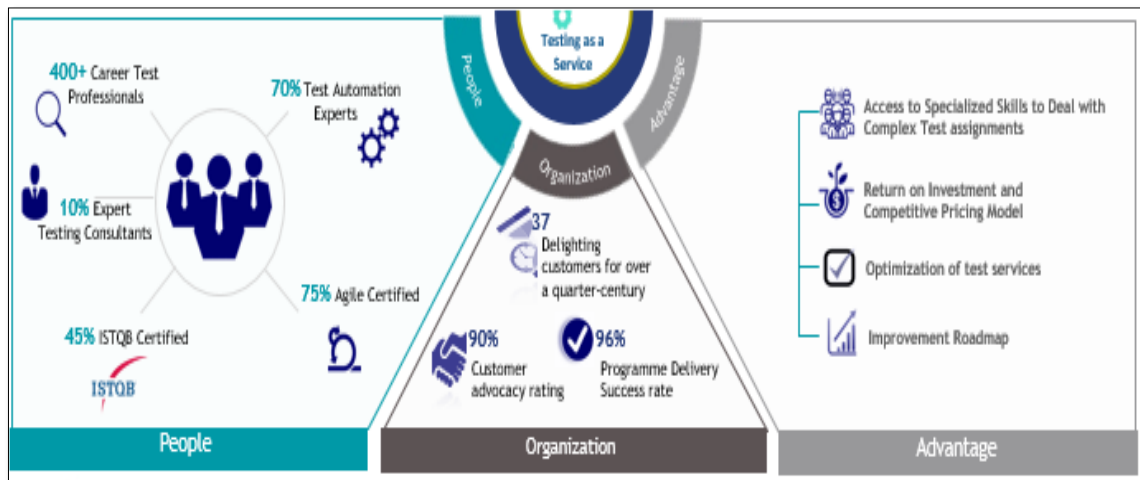


Figure 2: Our System Integration Testing

Our SIT services include reusable test assets and overnight automated execution for efficiency and reduced cycle time.

4. Key Features

Our services include the following key features:

- **Comprehensive test strategy and management:** We provide a comprehensive test strategy, planning and management approach for end-to-end system integration testing, ensuring 100% coverage of critical integration points across environments.
- **Diverse environment testing:** Our expertise encompasses testing integrations across various deployment environments, including data centres, hybrid cloud (combining on-premises and cloud infrastructure), private cloud and public cloud deployments.
- **Cloud integration expertise:** We offer specialised testing services for cloud integrations, including cloud infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS) testing models. We can help you develop a robust cloud integration roadmap and ensure seamless functionality within your chosen cloud environment.
- **Granular integration testing:** Our services go beyond overall system functionality testing. We meticulously test the integration of each part and subsystem within the broader system, including third-party integrations, APIs, workflows and reporting functionalities.
- **Data integrity assurance:** We prioritise data integrity by validating data exchange between modules and ensuring consistency throughout the integrated system.
- **Risk-based testing approach:** We leverage a risk-based testing approach to prioritise testing efforts based on potential impact and vulnerability. This ensures critical integration points receive the most thorough testing while optimising efficiency for less risky areas. Focuses effort on high-risk areas, helping to reduce costs and improve quality.
- **Accelerated Test design:** AI-enabled test design accelerates coverage for complex multi-system workflows.

5. Business Benefits

Partnering with Mastek for System Integration Testing Services unlocks a multitude of benefits that ensure seamless system connectivity, improved development lifecycles and a more robust software environment:

- **Enhanced system quality and consistency:** Our rigorous testing focuses explicitly on adherence to design principles, interoperability requirements and potential exception handling during integration testing, fostering a robust and consistent application. This minimises the risk of unexpected behaviour and ensures reliable system functionality.
- **Reduced maintenance costs and improved user experience:** By proactively identifying and rectifying integration issues, we help you minimise post-deployment maintenance costs and enhance the overall customer experience by eliminating disruptions caused by integration flaws.
- **Early defect detection and risk management:** Our meticulous testing practices facilitate the early detection and correction of system and software anomalies, significantly reducing the likelihood of critical issues impacting production environments. Additionally, a risk-based testing approach helps identify high-risk areas early, providing valuable insights for process and product risk management.
- **Faster time-to-market and performance optimisation:** Efficient testing processes minimise delays caused by integration problems, accelerating your time-to-market and delivering solutions to your users faster. We also offer performance testing to ensure your integrated system can handle expected user loads, delivering an optimal user experience. Accelerates delivery by 15–20% through automation and optimised SIT cycles.
- **Successful business integration and enhanced quality standards:** Our services empower successful business integration by guaranteeing seamless communication and data exchange between critical systems. This fosters improved quality standards across integrated applications, facilitating the achievement of your overall business goals.
- **Reduced costs and error-free delivery:** By proactively identifying and resolving integration issues early in the development lifecycle, we contribute to a significant reduction in the total cost of quality. This translates to a more cost-effective development process and a higher likelihood of delivering error-free products within your desired timeframe. Automation saves 30–40% of effort, significantly reducing overall SIT costs.

6. Technologies, Languages and Methods

#	Technologies	Languages	Methods
1	- API testing: - SoapUI, Postman, Rest Assured, Karate (Java).	- API testing languages: - Spoke, Pact, Karate.	- Agile Integration Testing: - Shift-Left Testing approach, Test-Driven Development (TDD) principles.
2	- Web services protocols: - SOAP, WSDL, RESTful APIs (JSON, XML).	- Markup languages: - HTML, CSS, XML.	- Risk-based testing: - Prioritising testing efforts based on potential impact and vulnerability.
3	- Cloud technologies: - AWS, Azure.	- Scripting languages: - Python (with frameworks like Selenium and Pytest), Java (with frameworks like JUnit TestNG) and JavaScript (with frameworks like Jest, Mocha and TestCafe).	- Continuous integration and delivery (CI/CD): - Integration with Jenkins, GitLab CI/CD, or Azure DevOps Pipelines.
4	AI-driven accelerators for test case generation and reusable SIT scripts.	React Web Application	Integrated with Jenkins and Azure DevOps

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