Mastek™

Trust. Value. Velocity

G-Cloud 14

Technical and Solution Architecture Service

Contents

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:

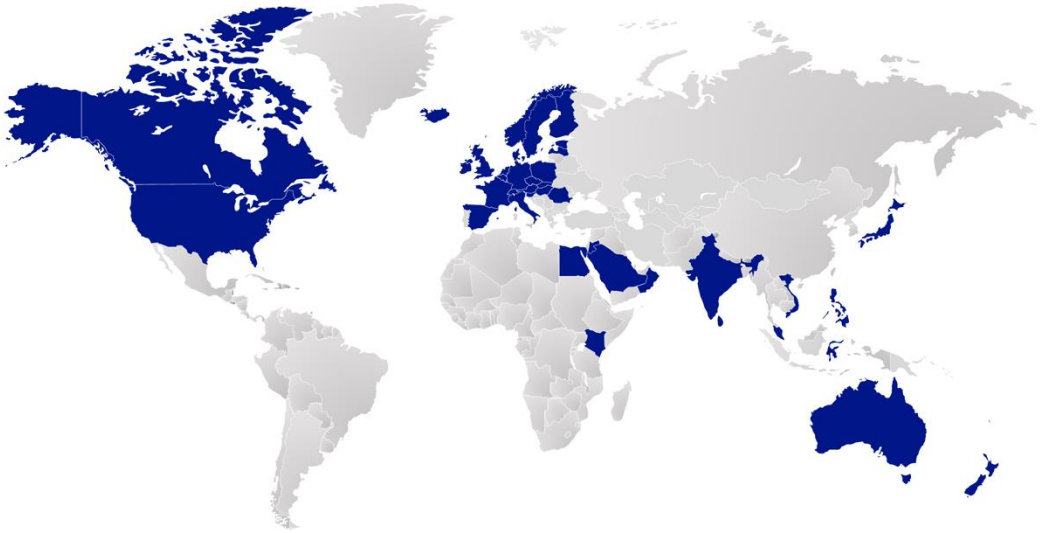
Working through a complex stakeholder landscape: We understand the importance of establishing effective communication channels, building trust, and fostering a collaborative working environment that empowers stakeholders to contribute meaningfully to the project's success. Our approach is based on a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



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Norway
Oman
Philippines
Poland
Romania
Singapore
Slovakia
Spain
Sri Lanka
Sweden
Switzerland
United Arab Emirates (UAE)
United Kingdom
USA

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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 though 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 & 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 & 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 & migration • Legacy modernisation • Low code / no code App Dev • DevSecOps • Enterprise integration	• MACH • Digital commerce • UX & 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 & 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

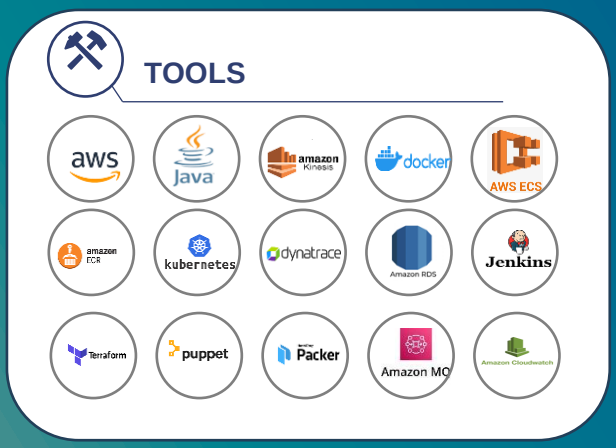
- Transition business-critical Platform services from incumbent supplier with minimal risk
- Migration from private cloud to AWS Cloud.

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:

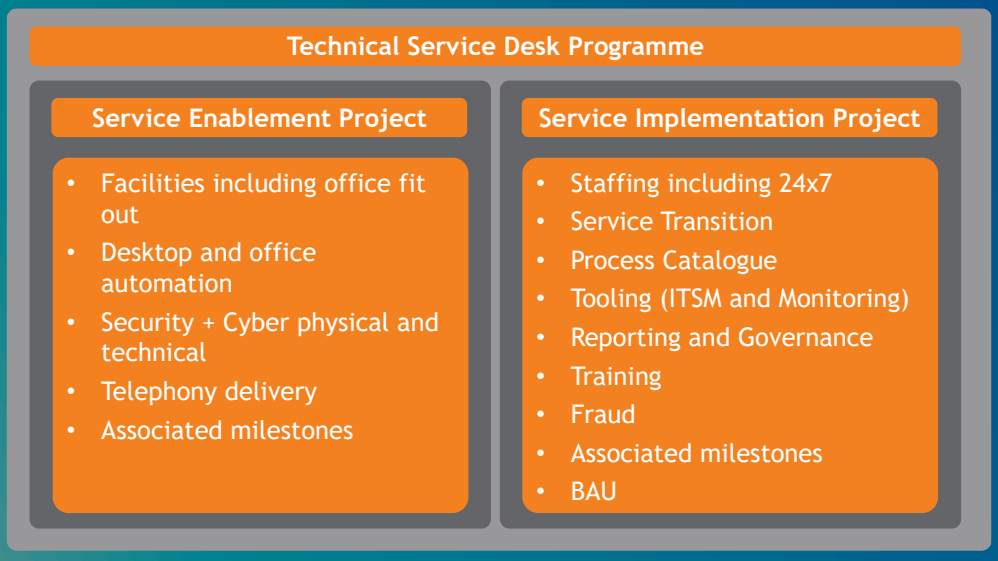
  - Service Management Vice President
  - Programme Director
  - Chief Technology Officer
  - Programme Management office lead.

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 & applications for Army Digital Services

Developed mobile app & 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

If you are considering migrating applications to or from the cloud, developing a whole new cloud infrastructure, developing new individual cloud applications, or simply optimising your existing cloud estate, then Mastek can help you.

We provide a full lifecycle set of architectural services ranging from enterprise through solutions to technical and can help you in every part of the journey. From identifying what needs to be done to planning, implementation, and support. Greenfield or brownfield, public, private, or hybrid cloud we have the expertise built up from years of running successful transformation programmes across the public and private sectors. This is backed up by our enterprise repository, rich in frameworks, methods, and reference architectures to provide best practices, standards, and guidelines for running an architecture function within an organisation.

Specific solution and technical architectures will vary depending on the client's requirements, workload, and the specific cloud service provider chosen. So, conducting a detailed analysis and design phase is essential to tailor the architecture to your specific needs. To provide a coherent solution and technical architecture for cloud computing, we must consider the key non-functional requirements (scalability, reliability, security, performance, supportability, maintainability, extensibility, etc.). Here is a high-level overview of the solution and technical architecture for cloud computing:

1. **Cloud service provider selection:** Choosing a reputable and reliable cloud service provider (CSP) such as Amazon Web Services (AWS), Microsoft Azure, or Google Cloud Platform (GCP) is key. Consider factors like pricing, available services, global presence, and customer support.
2. **Scalability and elasticity:** Design your cloud solution to be fully scalable and elastic, allowing it to handle varying workloads and easily accommodate growth. Utilise cloud-native services like auto-scaling groups, load balancers, and managed databases to scale resources up or down based on demand.
3. **High availability and fault tolerance:** Design the solution with redundancy and fault tolerance in mind. Distribute resources across multiple availability zones or regions to ensure high availability and minimise the impact of failures.
4. **Security and compliance:** Implement robust security measures to protect data and systems. This includes network security, identity and access management, encryption, and regular security audits. Ensure compliance with relevant regulations and standards such as GDPR (General Data Protection Regulation) or HIPAA.
5. **Data Management:** Use cloud-based storage services like Amazon S3 or Azure Blob Storage for scalable and durable data storage. Consider implementing data backup, replication, and disaster recovery strategies to ensure data availability and integrity.
6. **Virtualisation and containerisation:** Use virtualisation technologies like hypervisors or containerisation platforms like Docker to abstract the underlying hardware and enable efficient resource utilisation. This allows for easy deployment and management of applications across different environments.
7. **Infrastructure as Code (IaC):** Implement infrastructure as code using tools like Terraform or AWS CloudFormation to define and provision cloud resources in a repeatable and automated manner. This ensures consistency and reduces manual errors.

8. **Microservices architectures:** Consider adopting a microservices architecture to build the solution as a collection of small, loosely coupled services. This enables each service's independent development, deployment, and scalability, improving agility and fault isolation.
9. **Monitoring and logging:** Implement monitoring and logging solutions to gain visibility into the cloud infrastructure and applications' performance, availability, and usage. Utilise tools like AWS CloudWatch or Azure Monitor to collect and analyse logs and metrics.
10. **DevOps and Continuous Integration/Continuous Deployment (CI/CD):** Implement a DevOps culture and CI/CD practices to automate application development, testing, and deployment. Utilise tools like Jenkins, GitLab, or AWS CodePipeline to enable continuous integration and deployment.

3. Mastek's Service

Mastek has over a decade of experience providing architecture and design services to our customers in the cloud. We help them architect/design, build, and support enterprise-scale systems and solutions regardless of the cloud service provider involved (AWS, Azure, or GCP).

Our architecture services are underpinned by architects certified in the required frameworks and technologies (TOGAF (The Open Group Architecture Framework), Archimate, Zachman, SEI ATAM, Azure Certified, AWS Certified, etc.).

Internally, Mastek uses a mix of Archimate, UML, and BPML for modelling and TOGAF as our enterprise architectural framework, but we will adopt whatever standards you require.

We successfully support our customers on their digital modernisation journey by designing robust, elastic, resilient solutions on the cloud using modern architecture patterns like microservices, MASA, event-driven, etc.

- **Cloud provider selection**: This will enable you to make the right decision regarding your cloud partner(s).
- **Architecture and design review**: If you have an existing design that you feel could be better, we can review it for you, identify gaps, and make recommendations for improvements.
- **Architectural baselining** – analysis and documentation of the existing architecture, including gap and fault analysis.
- **Security architecture review** – Review and assess the information security architecture against various security standards such as ISO/IEC 27001.
- **Cloud Readiness Assessments:** Whether you're moving to or from the cloud or looking to implement a hybrid model, our readiness assessments can help you identify gaps in your capabilities, saving you time and money.
- **Solutions architecture and design**: Define the high-level target and transitional application architectures.
- **Technical architecture and design**: Define the low-level technical architectural components in line with the encompassing high-level design.
- **Enterprise delivery lifecycle design**—the design of the people, processes, and technology for delivering your cloud-based solution stack, including models for supporting Agile, DevOps, and continuous integration/deployment (CI/CD).
- **Governance and oversight**: Establish and operate architectural governance frameworks (architectural change management, risk management, compliance, etc.) in accordance with statutory, regulatory, and organisational policies and principles.
- **Architecture rationalisation and cost optimisation**: Review and assess the solution architecture (business, data, application, and technology) and rationalise it for optimum performance and cost.
- **Operation of architecture practices into Agile and DevOps delivery models** - e.g. Just-in-time architecture.

4. Business Benefits

- Closer tie-up between business and technology
- Improved software quality and shorter delivery times
- Lower business and technology risk
- Improved architectural change management
- Greater visibility through improved communication
- Better integration with the wider enterprise
- Lower cost of ownership.

5. Technologies, Languages, Methods and Vendor Support

Technologies	Vendor support	Methods
Discovery and Assessment Tools Cloud Migration Tools IaaS (infrastructure as a Service) PaaS (Platform as a Service) SaaS (Software as a Service) Serverless DevOps Containers Compute Services Database Services Network Services Manage/Monitoring Services Machine Learning Services.	• Amazon Web Services • Microsoft Azure • Google Cloud • Oracle Cloud.	• TOGAF • Zachman • Archimate • BPMN • UML • SEI ATAM • SAfE (Scaled Agile Framework for Lean Enterprises).

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