



Trust. Value. Velocity

G-Cloud 15

Predictive and Advanced Analytics 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 & 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

The **Predictive and Advanced Analytics Service** enables businesses to conduct what-if analyses, predict potential business changes, and project future trends using sophisticated analytical methodologies.

Predictive analytical models develop and convey data insights using mathematical algorithms, statistical analysis, and machine learning methods.

The predictive models help businesses exploit historical and transactional data patterns to identify risks and opportunities.

3. Masteks Service

Predictive data analytics utilises current and past data to enable you to make predictions or address other business uncertainties. Many business organisations have utilised this technique for years to assess risk, detect fraud, and predict demand for products or services, thereby increasing conversion rates.

Our predictive and advanced analytics service uses a data-driven approach, using predictive models to develop quantitatively robust solutions to business challenges.

3.1 Mastek Approach

We follow the Cross-Industry Process for Data Mining (CRISP-DM), a robust and well-proven method for providing a structured approach to planning analytics initiatives.

Our proven mathematical base approach brings speed to value and speed to deliver. Subsequently, customers can add more data to improve the model and incorporate new insights into other parts of the business workflow.



Figure 1: CRISP-DM Method

Additional information can be found here:

https://en.wikipedia.org/wiki/Cross-industry_standard_process_for_data_mining

Our execution approach is further derived using the CRISP-DM method. Our predictive and advanced analytics service execution approach uses data and statistics to predict outcomes with data models.

Our value-driven and result-oriented Predictive and Advanced Analytics Services framework offers:

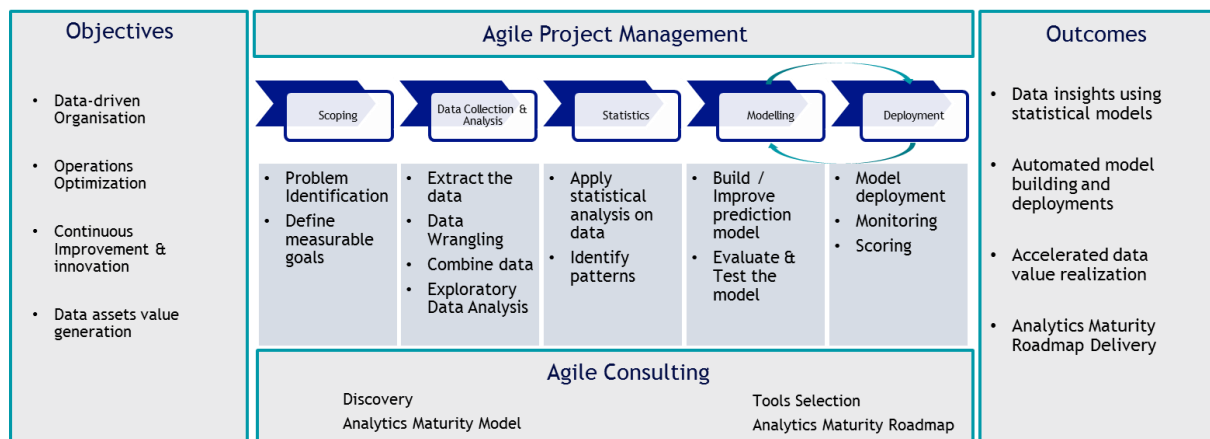


Figure 2: Masteks Predictive and Advanced Analytics Services Framework

3.2 Agile Consulting

We help customers translate business problems into Analytics questions that can be addressed with predictive models. During this, we identify and explore common use cases along the entire value chain. We rank potential business scenarios and use cases by evaluating them individually through a scorecard with appropriate key performance indicators.

This helps capture what customers want to know about the future based on the past, what they want to predict, how they plan to utilise predictions, and what actions they will take based on the predicted outcome.

Based on current analytical capabilities, we help customers develop an analytics maturity model to enhance digital skills by assessing potential areas for improvement, including data, leadership, targets, technology, and analytics techniques.

3.3 Agile Project Management

Our Agile project management approach helps accelerate delivery and increase value through the governance process.

3.4 Analytics Service

It takes advantage of various analytics and machine learning tools and our data science expertise. We leverage cutting-edge technology tools and our frameworks to perform EDA and Data Wrangling activities.

This is data collection and data analysis. We collect data from various transactional systems, logs, social media, and third-party applications. This step is focused on data wrangling activities, where we cleanse and prep the data for analysis. Data preparation is a time-consuming activity, and our experts utilise various cutting-edge data-wrangling toolsets to perform this task.

The “best” algorithm for solving the business problem depends on the data. Experimentation is key to finding the most reliable answer, and we utilise automated model building using AutoML, which can help minimise the time to results and boost the productivity of analytical teams.

3.5 Analytics Model Build

Develop initial prototypes based on various predictive modelling techniques. Deploy the model to monitor the model scoring. This enables us to validate the assumptions, hypotheses, and tests using standard statistical models. Using our experience with interactive, self-service visualisation tools, we help customers search for relationships, trends, and patterns to understand the data better.

The predictive model deployment step enables the deployment of the analytical model in the analytical environment, allowing business users to test, verify, and monitor its performance and accuracy. This is an iterative step where the model learns over time using the data.

4. Key Features

- CRISP-DM methods as a structured approach to start analytics initiatives.
- Analytics value chain - Operationalising analytics with decision modelling.
- Incremental business value approach delivers value and recognises ROI in the early phase.
- We use our expertise in exploratory data analysis and leading industry-standard toolsets to discover deeper insights, make predictions, and generate recommendations.
- Powered with several different predictive models and algorithms to support any business predictive use case.

5. Business Benefits

- Underpins your organisation's business strategy and drives day-to-day decisions.
- Provides a comprehensive view of your overall business and various business functions, forecasting future outcomes based on historical data.
- Spawn and drive strategic business initiatives.
- Better management and maintenance of business assets present the business with a potential new revenue stream.
- Brings more certainty to business.
- Advanced predictive analysis techniques can help public sector organisations in use cases like:
 - Detect fraud and maximise collection through optimised and cost-effective customer contact programs.
 - Observe patterns and interrelations in criminal activities and identify hotspots with a high incidence of crime, which will allow police departments to intervene quicker.
 - Predicting risk scores based on lab testing, biometric data, claims data, patient-generated health data, and the social determinants of health gives healthcare providers insight into which individuals require readmission.
 - Better targeting of taxpayers for possible non-compliance/ tax evasion and liquidation for public sector organisations.
 - Forensic activities run through a large set of data to identify malicious code, anomalous patterns, and network threats, helping to predict cyberattacks. This allows governments to take a proactive approach rather than a reactive stance.

6. Technologies, Languages, Methods and Vendor Support

#	Technologies	Languages	Methods	Vendor support
1	On-premises	Python, ML .NET, R, Java, Scala	CRISP-DM	-
2	Cloud-based	Python, ML .NET, R, Java, Scala	CRISP-DM, AutoML	Microsoft Azure, Google Analytics, AWS
3	Visualisation	Power BI, Excel, Tableau	-	-

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