

Software Development Services

Service Definition Document
Jan 2026

Contents

1. Introduction.....	3
1.1 Brief Overview	3
1.2 Purpose of the Document	3
2. Service Overview.....	4
2.1 Description of Software Development Services	4
3. Development Process	5
3.1 Introduction	5
3.2 Methodologies	5
3.3 Gathering and Prioritising Requirements.....	5
3.4 Development Phases.....	6
3.4.1 Planning	6
3.4.2 Analysis.....	6
3.4.3 Design	6
3.4.4 Implementation	6
3.4.5 Testing & Integration.....	6
3.4.6 Maintenance	6
3.5 Ensuring Successful Development.....	7
3.5.1 Quality Gates	7
3.5.2 Reflective Practise	7
3.5.3 Validated Learning.....	7
3.5.4 Software Engineering Metrics.....	7
3.6 Why MASS?.....	7
4. Development Team.....	9
4.1 Team Structure	9
4.2 Team Capabilities	9
5. Project Management	10
5.1 Defining the Scope, Objectives, and Deliverables	10
5.2 Tracking Project Progress	10
5.3 Client Communication.....	10
6. Quality Assurance	11
6.1 QA Processes.....	11
6.2 Testing Methodologies.....	11
6.3 User Feedback	11
7. After-Sales Support.....	13
7.1 Support Services	13
7.2 Support Process	13
8. Prior Experience	14
8.1 User-Centred Design & Agile Software Development.....	14
8.2 MOD Electronic Warfare Capability	14
8.2.1 Key Benefits.....	15
8.3 Utilising SAFe Agile Framework	15

1. Introduction

1.1 Brief Overview

MASS's software development team comprises highly qualified, skilled and experienced professionals proficient in leading coding languages and contemporary agile methodologies. We possess a demonstrated history of successfully designing, developing, trialling, testing, deploying, and providing ongoing support for bespoke software solutions across a broad spectrum of sectors, including defence, security, and policing.

1.2 Purpose of the Document

The purpose of this document is to highlight the Software Development Services that MASS provides and how we ensure their delivery for our clients.

2. Service Overview

2.1 Description of Software Development Services

MASS's Software Development team can cover all or any part of the software development lifecycle, and the services that we offer include:

- **User Experience** – our team has extensive experience carrying out user experience discovery projects and providing user research reports for a range of clients. Using techniques such as contextual enquiries, interviews, surveys, user-centred design, wireframing, and usability testing. We use this to inform the development phases when developing software.
- **Software Development** – we develop software products for our clients, covering the whole development lifecycle and utilising a variety of methodologies, including waterfall, iterative-incremental, and agile to ensure their requirements are met. Using user-centred design practises, our team work to understand the needs of our clients, and design, develop, test, install, and maintain bespoke software throughout the defence and security industries. Our team are both technology- and methodology-agnostic and are well-versed in a huge range of coding languages, following defined development processes to ensure the best product is developed.
- **Software/Hardware Integration** – we develop software to enable communication between systems, ensuring effective integration, with ongoing maintenance and support processes in place.
- **Software Testing** – we ensure rigorous testing of all developed software, including unit, system, and acceptance testing, as well as static analysis. We are experienced at quality assurance processes through peer review, in accordance with user interface, accessibility, and coding standards.
- **Software Support** – we operate a software helpdesk to resolve any incidents and problems with the software we develop. We also provide ongoing support and maintenance packages to ensure clients' products are kept up-to-date and to guarantee value for money.
- **Software Research** – our team are proficient at conducting technology watch and software research to ensure we are up-to-date with new technologies and methodologies and advise our clients accordingly.

All of these deliverables, whilst offered as distinct services, are nested inside the development of software products. In order to produce software, our teams cover the entire lifecycle of development, including user research, design, testing, and support.

3. Development Process

3.1 Introduction

MASS implements defined processes to ensure the success of Software Development tasks that our team undertakes. These processes are stored in our internal Software Development Manual, written in accordance with our MASS Management System (MMS), which is certified to ISO9001:2015 Quality Management and ISO 27001:2013 Information Security Management.

The manual also goes beyond our certification and is guided by other ISO standards, as listed below:

- ISO15288:2015 System Lifecycle Processes
- ISO12207:2017 Software Lifecycle Processes
- ISO25010:2011 System and Software Quality Models
- ISO15026:2019 Systems and Software Assurance
- ISO15408:2009 IT security
- ISO9241:210 Human-centred design activities
- ISO9241:11 Usability

The consideration of other important factors influences our Software Development work, and adherence to these standards ensures our software quality.

The manual has coverage for the whole Software Development Lifecycle, incorporating requirements, design, code, and test, and is available to the whole team throughout the development process.

3.2 Methodologies

There are many different methodologies recognised within the Software Development industry. MASS predominantly utilises three: waterfall, iterative-incremental, and agile. In all cases MASS apply user centred design.

Crucially, our team are methodology-agnostic and are able to comfortably tailor our approach to meet the requirements of our clients.

3.3 Gathering and Prioritising Requirements

In order to determine how to proceed with project development phases, our team employs user / stakeholder research and analysis to understand users and their needs. This informs our user-centred design practises, and can take the form of techniques such as:

- Usability testing – observing users perform specific tasks using products to identify problems, discover opportunities, and learn more about user behaviours.
- Contextual enquiry – observing a user interacting with a product in their natural environment, conducting activities in the way they normally would, in order to gain a detailed understanding of their work practises and behaviours.
- Red route analysis - allowing users to specify the most important usability features within a piece of software.
- User journey mapping – a visual representation of the process a user goes through in order to accomplish a particular goal, demonstrating the behaviours, pain points, and positives for each step.

- Interviews/Surveys/focus groups/workshops – to acquire individual and group insights and feelings regarding user needs and behaviours.

Through subsequent analysis, we then use prioritisation principles, such as MoSCoW, to ensure we are developing software that considers specific customer needs and is tailored to them.

3.4 Development Phases

During projects, MASS adheres to the six phases of development, being Planning, Analysis, Design, Implementation, Testing & Integration, and Maintenance. These phases, depending on the requirements of the clients, and the methodology chosen to ensure those requirements are met, are applied differently and at different levels.

3.4.1 Planning

This involves the gathering of clients' requirements, defining the project's inputs, outputs, and constraints, and is led by our team's project manager.

3.4.2 Analysis

As stated above, in this phase, clients' requirements are analysed and prioritised, assessing the project's inputs, outputs and constraints to derive more detail. MASS ensures collaboration between the Software Development team and other roles, such as Business Analysts and Product Owners, to ensure detailed analysis and better inform the development process.

3.4.3 Design

Our team take the requirements, derived in the previous phases, and develop an abstract solution for the client.

3.4.4 Implementation

Our experienced and qualified software developers produce working software that fulfils the clients' requirements and satisfies the design.

3.4.5 Testing & Integration

Our software test specialists validate and verify the working software against the clients' requirements and designs developed in previous phases.

3.4.6 Maintenance

Our team provides clients with corrective and preventative software changes once they have been installed, to ensure longevity of our products and value for money for our customers.

3.5 Ensuring Successful Development

MASS ensures the success of our software development projects through a number of quality checks and procedures, including quality gates, reflective practise, validated learning, and the use of software engineering metrics.

3.5.1 Quality Gates

Depending on the methodology employed during development, we employ quality gates throughout the development lifecycle, including both design and test readiness reviews. Design reviews stimulate feedback on the correctness of the designs before development starts, offering the opportunity for our clients and our team to remove ambiguity in the solution and formulate an agreed understanding of it. We utilise two design reviews, Preliminary Design Reviews (PDRs) and Critical Design Reviews (CDRs), controlled by a Project Manager.

Test Readiness Reviews (TRRs) are used to inspect test products and the results from test phases for completeness and accuracy, providing assurance that the software has undergone a thorough test process and is ready for handover to the next test phase.

3.5.2 Reflective Practise

During agile development, the team engage in daily “stand-up” meetings which allow them to evaluate the status of development. We also use sprint reviews and sprint retrospectives to allow for the review of progress and the team's performance.

3.5.3 Validated Learning

Following our methods of reflective practise, our team identify improvements to be actioned in future sprints. For example, if a particular technology was found to be ineffective, we would pivot to a different technology during the planning for the next sprint. This ensures continual improvement throughout the development process.

3.5.4 Software Engineering Metrics

Progress monitoring incorporates quality metrics which are reported by the test team to MASS's Head of Software Development for analysis and resolution if there are any recurring issues. Appropriate metrics are chosen to suit the service. Examples might include standardised calculations, such as estimation accuracy, functional compliance (as a percentage), failed formal test case (as a percentage), defects fixed (as a percentage), test effectiveness, as well as others.

3.6 Why MASS?

Through our processes, MASS puts our clients' needs at the centre of development. We empower our clients' product owners to work directly with our development team without putting management layers in between. We can provide customer access to our development environment, through tools such as JIRA, where they can look at the quality reports, test reports, and the progress tracking. This insight and collaborative approach ensure the quality of a final product that adheres directly to their requirements.

We also approach every problem on its own merits, and our team are extensively experienced at understanding requirements, developing approaches that work for that context and problem, being both technology- and methodology-agnostic.

4. Development Team

4.1 Team Structure

MASS's Software Development Team is structured to ensure high quality products are developed for our clients, with the appropriate skills and governance allocated to each phase of development.

At a departmental level, we divide our team into four practices: user experience, development, test practice, and support. The practices work together to ensure effective software development.

At a project level, the roles within the team include product owners, scrum masters, user experience/development/test team members, and project managers (who are not actively involved in the development process but monitor progress and evaluate posture).

The team is led by MASS's Head of Software Development, who oversees the entire department at both the departmental and project levels. He is responsible for:

- Defining the policies, practices and procedures for Software Development.
- Ensuring that required software development tools, applications, libraries, staff training, hardware, and other resources are available for the duration of the project.
- Providing guidance and expertise to ensure a consistent approach to developing MASS' software products.
- Providing Software Development governance.
- Fostering an environment of continuous improvement in Software Development.
- Allocation of Software Development department resources to projects.
- Recruitment to ensure the necessary skills for development.

4.2 Team Capabilities

MASS's software development team are extensively experienced, with the training and skillsets to ensure the success of development projects. The team are experienced in all approaches, including agile, waterfall, incremental, and prototyping, and have strong defence experience, working on complex and niche problems. All of the staff within our software development department are appropriately security cleared.

The experience of our team means they are proficient in several areas, covering the whole software development lifecycle including, but not limited to:

- User experience – contextual enquiry, user journey mapping, personas, empathy maps, wireframing.
- Design – UI design & wireframing, UML, architecture styles & patterns, database design.
- Code – JavaScript, Java, Typescript, C, C++, C#, Xaml, Python, PyQT, LabView, PLSQL, Esri, MERN, Oracle, LLM integration, SQL Server, Leaflet, Postgres, and others.
- Test – exploratory testing, test automation, boundary analysis, acceptance testing, system testing, and test software including Test Complete, J-Unit, and Playright.

5. Project Management

5.1 Defining the Scope, Objectives, and Deliverables

Throughout Software Development projects, we implement project management processes to ensure the development adheres to quality standards, as well as the requirements of our clients. According to our clients' requirements, we deliver capacity and competence-based contracts, ensuring the delivery of products that respond to clients' needs and to any agreed upon timescales.

As stated in Section 3.4, an initial requirements elicitation, analysis, and prioritisation is done in collaboration with the client which then informs the methodology for development and subsequent workflows. Crucially, our experience means we can align this methodology and the workflows that follow with customer needs, satisfying our clients.

5.2 Tracking Project Progress

MASS utilises visual tools such as sprint burndown charts, epic burndown charts, and cumulative flow down diagrams to track project progress and ensure key milestones are hit during development. We allow our clients access to these to inform the development process and cultivate communication and collaboration, resulting in final products tailored to their needs.

5.3 Client Communication

MASS's approach to client communication throughout software development projects is frequent and proactive, and we make use of both informal and formal channels which are agreed at the outset of any project. These include design workshops, where we will collaborate to input into the requirements for development, sprint ceremonies, where both our team and the client can review progress and inform the planning for the next sprint, as well as contract status meetings and monthly reports.

Through maintaining communication throughout the development process, we ensure our clients have consistent input into the development of products designed for their use, thereby increasing their quality.

6. Quality Assurance

6.1 QA Processes

As stated above, MASS implements defined software development processes, as stored in our internal Software Development Manual, to ensure the quality of our developed products. This manual was written in accordance with our MASS Management System (MMS), which is certified to ISO9001:2015 and ISO 27001:2013 and is guided by several other standards (ISO15288:2015, ISO12207:2017, ISO25010:2011, ISO15026:2019, ISO15408:2009, ISO9241:210, and ISO9241:11).

Our processes are regularly audited in accordance with our ISO accreditation. This includes our annual audit from an external body, as well as internal auditing of our projects through samples.

Within projects, we have quality gates, including PDRs, CDRs, and TRRs, to ensure our designs and products are ready to move onto the next stages of development.

MASS's Quality Assurance team also monitor customer satisfaction through surveys that are independent from individual projects, which customers can fill out as they see fit.

6.2 Testing Methodologies

Throughout the development lifecycle, MASS utilises various testing methods to ensure our products are of a high quality for our clients. This includes, but is not limited to:

- **Unit testing** – this validates that a component, module, or feature is functioning as expected, with observations and results recorded by the test team. MASS also utilises repeated, automated unit testing to further validate our products.
- **System testing** – this verifies that the developed software meets specified requirements and is done independently by our test team leader.
- **Acceptance testing** – this confirms that the software meets customer requirements and is done independently by our test team leader.
- **Static analysis** – to detect coding style violations, thereby assessing code quality.
- **Peer review** – team members who are independent of a development project conduct peer reviews against coding and user interface standards to ensure their quality.
- **Usability and Accessibility** – to validate our design decisions and identify opportunities for improvement and ensure our solutions are usable for all including those with disabilities

6.3 User Feedback

MASS operates user-centred design practises, ensuring our clients' end users and requirements are at the heart of our development process. This means we utilise any feedback or observations from them to inform our progress.

During planning phases, our research and analysis uses methods such as interviews, surveys, focus groups, and workshops to define the requirements for projects. We also engage in usability testing to learn about user behaviours. During design phases, we use methods such as wireframing, wherein we create prototypes with limited functionality that represent the final product to analyse optimal navigation and usability for the users. We incorporate our clients into the sprint review processes, wherein they offer feedback that informs the planning for the next sprint.

When any observations and feedback are provided, we use an observation triage process, adding all feedback to the software backlog for actioning in accordance with agreed prioritisation. Through this process, we again ensure our products are tailored to our clients' needs.

7. After-Sales Support

7.1 Support Services

Once our software has been fully developed and integrated on our clients' systems, we undertake corrective and preventative maintenance and support activities to ensure the continuous operation of our products.

This can range from various technical patches, including bug fixing, updates and upgrades, new features, installation support, system monitoring and health checks, and database administration. We endeavour to put together packages of support that meet the clients' direct needs and agree delivery cadences per project with them individually. For example, if a client has their own IT team who can manage some of the maintenance tasks themselves, we will provide knowledge transfer to enable them to do so. For other clients, we provide a full support package ourselves.

7.2 Support Process

These support packages are operated through our software helpdesk, who act as the first line of communication for our clients and respond to any issues with the software, working to resolve them, with escalation procedures in place if required. We often expedite critical patches, such as security vulnerabilities, which we will typically roll out as quickly as possible.

8. Prior Experience

MASS has extensive experience delivering our software development services to a range of customers in both the private and public sectors, as illuminated in the case studies below.

8.1 User-Centred Design & Agile Software Development

MASS was engaged in a project to initially provide six months of software development and deliver a user-friendly interface enabling the construction, transformation and loading of 'mission fills' into deployable Jammer systems.

Due to the complex nature of the client's data and bespoke hardware-embedded API, our team proposed a collaborative agile approach. The task was further complicated by the significantly delayed receipt of a 'hardware emulator' to interface with.

The Scrum-agile approach enabled the team to work closely with the client to derive and prioritise tasks, ensuring efficiency throughout the team. The cyclic validated-learning nature of Scrum enabled the team to evolve their understanding of the problem space and develop interfacing capability in the absence of the hardware emulator.

The UX specialist worked continuously with users to understand their needs, producing user stories, wireframes, workflows and data structures that formed the basis of user-centred-design and development activities.

Throughout the project's duration, a fully integrated DevOps pipeline was used that included task tracking (through Jira), source control (through Bitbucket/GIT), Continuous Integration (through Jenkins) and UI-driven automated tests (through Test Complete). At all stages, the client had direct access to the Jira backlog, enabling the creation and refinement of User Stories.

With three-week sprints, the customer received regular working software builds for evaluation against their hardware, along with a demonstration of new features. The team regularly collaborated with the PO in sprint planning sessions to understand and agree the focus of the subsequent sprint whilst utilising their domain experience to offer innovative suggestions for feature and technical improvements or investigations.

In the true spirit of agile, when the client was unable to deliver a required Interface Design Document dependency, the team offered to take responsibility for the production of this document in close collaboration with them. This agile activity, refined and evolved over the course of a number of sprints, unblocked development work whilst enabling the customer to focus their internal efforts elsewhere. A specific citation was given by the customer on the innovative flexibility of the team and the high quality of the document.

The project delivery was so successful, developing extremely close working relationships with the customer, that the contract has been repeatedly extended with a subsequent separate agile team being stood up for a separate package of work to provide deployed network oversight and management. This is an ongoing project with a 97% customer satisfaction rating.

8.2 MOD Electronic Warfare Capability

MASS supports a national programme developing and supporting a critical capability. MASS has led several work packages, including the tailoring of commercial-off-the-shelf (COTS) software, the

configuration of hardware, bespoke software development, and integration, acceptance testing and ongoing support for each of the above packages.

The project has delivered efficiencies, cost savings and increased capability. The capability improvements included delivering a complex database, allowing systems to be described in greater fidelity. This allows the customer to model current/future threats. Efficiencies allowed the customer's small, but skilled workforce, to populate a higher fidelity database. Changes had to enable cost savings by allowing the new system to be supported by fewer staff than the legacy model. Efficiencies were achieved by tailoring the user interface to enhance user performance, the introduction of automated data ingests, and a human workflow tasking system with business activity monitoring.

During development, MASS garnered user feedback from multiple sources to further develop and tailor the system to the customer's needs. Regular workshops were held throughout development to optimise the solution.

Formal Observation Review Boards allowed issues to be efficiently resolved. MASS also sought feedback about the maintainability, usability, learnability and performance in order to help further enhance the solution provided.

8.2.1 Key Benefits

- Reduces the analytic effort by enabling common reference data to be maintained in one place rather than duplicating effort in many places.
- Automates data ingest through ETL capabilities and an Application Programming Interface (API), enabling the client to benefit from the analysis by partner nations.
- Provides a comprehensive GIS capability to enable geo-correlation.
- Includes a multi-level output security solution to enable output at a given classification with the potential to backfill redacted holes with lower classification replacement data.
- Service-oriented architecture enables the customer to give access to many data consumers and procure and integrate additional software systems.

8.3 Utilising SAFe Agile Framework

MASS completed a contract in April 2022 working for a government department on a classified project, providing an agile team of developers to migrate complex federated search capabilities into a private cloud deployment. We were primarily tasked with research and development of a minimum viable product (MVP), with both our team and the client's working remotely, collaborating using the SAFe agile framework inside the same codebase and DevOps infrastructure. The result was the successful delivery of an end-to-end data pipeline MVP. MASS's good collaborative skills ensured a good working relationship amongst all stakeholders and proved the efficacy of remote collaborative working on (de)classified government digital services, resulting in a contract extension.

MASS Head Office:

Enterprise House | Great North Road | Little Paxton | St Neots | Cambridgeshire | PE19 6BN | UK

T: +44 (0)1480 222600 | E: systems@mass.co.uk | www.mass.co.uk

MASS/BID/010 Issue 4 12/12/23