Improving every journey

Technology Strategy

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Executive summary

Delivering secure, resilient, and customer-centric digital services

Technology is a key enabler in the delivery of both the Caledonian MacBrayne corporate plan and the purpose that unifies us, which is – to navigate the waters, ensuring life thrives wherever we are – a sentiment which has been a north star for us, and our lineage, since 1851.

As you might imagine, compared to our origins 175 years ago, technology is now a much greater part of our operational service provision and is central the daily lives of the communities we support. The pace of technology change and the use of data, artificial intelligence and automation will accelerate further in the lifespan of the Clyde and Hebridean ferry services (CHFS) contract – and these are aspects we will be prepared to respond to.

This Technology Strategy explains the technological strategic priorities for Caledonian MacBrayne in the period 2025 – 2031.

It sets out our approach to delivering the contractual commitments as the operator of the Clyde and Hebridean Ferry Services (CHFS) agreement, and how enhancements to improve the customer experience will be delivered.

We have an opportunity to transform Caledonian MacBrayne's technology provision, which will in turn:

– provide resilient IT infrastructure,

– introduce and develop modern technology applications and data platforms that optimise CalMac's operations and,

– enhance innovation, using digital technologies to further improve the customer journey.

Our strategic approach to the technology that underpins our operation needs to be agile. We are committed to being able to respond to customer and colleague feedback, as well as to the wider technological change and enhancements available to us through the market.

This Technology Strategy will be reviewed on an annual basis to ensure that it remains aligned to Caledonian MacBrayne's corporate requirements and to the wider objectives around public sector reform and the fast-evolving Scottish public sector digital and AI policies and programmes.

1. Introduction

Purpose

Caledonian MacBrayne provides ferry services which are sustainable, integrated, safe, and accessible, which actively support the economic and cultural prosperity of the Scottish island, coastal and peninsula communities we serve. In an increasingly digital world, our technological capability is fundamental to delivering that vision, outlined above – and set out in our Corporate Plan 2025-31.

This Technology Strategy provides and sets out both the direction and the strategic priorities for how Technology will support the delivery of our Corporate Plan 2025-31.

The Technology Strategy aligns IT investments and their delivery with our corporate objectives and CHFS3 requirements. The strategy itself and its delivery will be underpinned by operational excellence, cybersecurity rigour, and an ongoing technological and digital transformation across data, infrastructure, and applications across Caledonian MacBrayne.

Scope

The full range of Caledonian MacBrayne's technology and digital infrastructure is covered by this strategy. Specifically, it applies to and includes software applications, underlying infrastructure, use of data and data governance, digital technologies and cyber security.

2. Strategic vision

Technology at the heart of safe, resilient and efficient ferry services

Our vision, in terms of technology is that by 2031, Caledonian MacBrayne will be externally recognised as a technological and digitally mature transport operator, where our:

– technology is resilient, secure, and reliable, accessible and highly available.

– operational processes are streamlined through technological and digital capability.

– customers experience seamless end-to-end service using modern technology.

– data drives decision-making and provides predictive insights to support our decision making.

– cybersecurity is robust, compliant, and continuously improving in the face of an increasing threat landscape.

Cross functional strategic technology themes

In parallel to the four key strategic technology projects detailed, there are technology themes that underly all areas and are core to the technology transformation programme.

Digital Inclusion

Ensure Caledonian MacBrayne technology services are accessible to all users, including those with accessibility needs.

Sustainable IT

Reduce operational carbon footprint through efficient hosting and infrastructure choices.

Caledonian MacBrayne has solid and growing green credentials and will continue to support and align to the Scottish public sector Green ICT strategy, Scotland's Digital Future: Scottish Public Sector Green ICT Strategy - gov.scot

Collaboration

Caledonian MacBrayne will partner with transport ecosystem stakeholders for integrated travel solutions.

Caledonian MacBrayne workforce capability

Caledonian MacBrayne will invest in delivery of technology, digital and data skills through training, certification, and career pathways to assist colleagues.

Strategic vision theme - technology resilience

One of the central objectives and themes of our strategy is ‘technology resilience.’

This means that we will deliver robust and highly available technology that supports ferry and port operations effectively. Enhanced technology resilience will ensure Caledonian MacBrayne’s operations can be planned and executed with full confidence that any technology issues will be managed and controlled to fully and confidently minimise risk, and if these were to occur, incidents are resolved quickly through tightly managed operational level agreements.

To deliver this, we will:

– Design, build and adopt modern infrastructure architectures.

– Design, build and test technical redundancy and IT disaster recovery capabilities to ensure their resilience.

– Move from reactive monitoring to adopting a real-time observability platform that provides IT operational intelligence across our technology and digital estate.

– Achieve and maintain industry recognised cyber certifications and improvements in cyber security maturity, aligned with industry frameworks.

This will support the delivery of following outcomes:

– Delivery of a stable Caledonian MacBrayne operation that meets our operational and customer expectations.

- Allows Caledonian MacBrayne to plan efficient operations for both staffing and facilities with confidence.
- Technology will perform to expectations and remain highly available throughout operational requirements.
- Improved cyber security posture.
- Risks against Caledonian MacBrayne that have an operational impact, including data breaches and financial loss, are mitigated.
- Technology teams are focused on adding business value as opposed to managing challenges.

Technology vision theme	Outcome	Measures of Success
Technology resilience - driving a stable operational performance for Caledonian MacBrayne.	– Delivery of a stable Caledonian MacBrayne operation that meets our operational and customer expectations.	– Increased critical systems mean time before failure (MTBF). – Reduced critical systems proven recovery time (MMTR). – Improved Technology service availability. – Technology disaster recovery plans and a continuous testing regime.
	– Allows Caledonian MacBrayne to plan efficient operations for both staffing and facilities with confidence. – Technology will perform to expectations and remain highly available throughout operational requirements.	– Achieve efficiencies in organisational structure and increase opportunities and options for redeployment.
	– Improved cyber security posture risk mitigation against Caledonian MacBrayne operational impact, data breaches and financial loss.	– Maturity level improvements against good practice frameworks (NIST) measured by independent audits. – Industry recognised certifications e.g. Cyber Security Essentials +
	– Technology team focused on adding business value as opposed to managing challenges.	– Reduction in technology major incidents.

Strategic vision theme - Technology enabling operational efficiency

To support our vision of being a resilient and reliable service, our technology capabilities are key. Technology is involved at the earliest stage of developments, and as an active and proactive partner on opportunities across Caledonian MacBrayne.

Technology is a proactive partner in our operations, driving technology, digital and data products that instigate performance improvement and add value.

To deliver this, we will:

- Create a 5-year application strategy which will set out a Target State Application plan and a delivery sequence. This will be aligned with the wider Caledonian MacBrayne portfolio of business improvements, including an enhanced customer booking experience and improved fleet reliability.
- Consistent with the Application Strategy, procure, design and implement modern applications to provide Caledonian MacBrayne operations with leading application solutions. This will modernise operational processes, workflows and decision support tools.
- Automate repetitive tasks and reduce manual work for colleagues.
- Modernise integrations across applications (within Caledonian MacBrayne) and across external parties to support e.g. Smart and Integrated ticketing.
- Implement end-to-end digital workflows across Caledonian MacBrayne operations.

This will support the delivery of the following outcomes:

- Improved management of service disruptions.
- Removal of capacity/bottleneck issues through reporting, measurement, monitoring and alerting of operations in real time.
- Ability for staff to collaborate and access information anytime, any place, on any device.
- Extend information access to controlled stakeholders' groups.
- Improved management of assets

Technology vision theme	Outcome	Measure of success
Technology Driving Operational Efficiency Efficiency driven by deployment of technology to automate processes and provision of data and insight to assist decision-making.	– Improved management of disruptions.	– Reduced time to respond and recover from disruption events. – Predictive modelling of events and options. – Improved engagement with customers and stakeholders.

		– Automation of changes to bookings.
	– Reporting, measurement and monitoring and alerting operations in real time to manage capacity/bottlenecks and issues.	– Improved passenger feedback. – Improved management information. – Reduced volume of crisis management incidents.
	– Mobile solutions for staff to collaborate and access information anytime, any place, on any device. Extend information access to controlled stakeholders' groups.	– Staff satisfaction surveys. – Stakeholder feedback. – Open and just culture. – Enhanced trust with stakeholders.
	– Improved asset management	– Greater accuracy and consistency of fleet data. – Enable new processes e.g. Condition based management. – Reduced survey and inspection time from MCA.

Strategic vision theme – Driving customer experience

We will introduce technology which enhances good industry practice and introduces more innovation to the passenger journey – to enhance positive passenger and stakeholder feedback on deployment of customer facing technology.

To deliver this, we will:

– Modernise customer booking and payment systems.

– Provide real-time travel information to passengers.

– Integrate with smart travel platforms and third-party apps.

– Collect customer feedback into the development of technology products - and iterate improvements.

This will support delivery of the following outcomes:

- Improved operations and enhanced opportunities from deeper insight about our customers, enabled by technology applications providing data platforms.
- Improved customer experience with a smooth, seamless and joined up customer journey.

Technology vision theme	Outcome	Measure of success
Technology providing facilitation of improved customer experience.	– Technology applications providing data platforms with deeper insight about our customers to enable improved operations and driving more opportunities.	– Customer data more accurate and greater breadth. – No. of customers engaging via technology channels. – Increased income per passenger. – Real time operational/ vessel data. – Predictive analysis and modelling to support decision making.
	– Customer experience improvements.	– Improved CSAT feedback scores – Social media positivity. – Improved customer booking completion rates. – Improved Mobile app ratings – Lower average booking time. – Increased monthly active users on eBooking site.

4. Key technology principles

Technology architecture principles

As we strive to deliver the technology strategy and the themes within it - our technology transformation decisions will be underpinned by a clear set of technology architecture principles that will guide our decisions. They are detailed below.

No.	Principle	Description

1	Customer at the core	All architectural decisions and application development must prioritise the needs, experience, and safety of Caledonian MacBrayne's diverse customer base, which includes passengers, freight operators, and the communities we serve - to improve every journey.
2	Adopt not Adapt	Buy best fit before customisation or build - adopting standard, commercial off-the-shelf (COTS) solutions and industry good practice, configuring them to meet Caledonian MacBrayne's specific needs, rather than extensively developing bespoke solutions.
3	Cloud First	New applications and infrastructure components should primarily be designed and deployed in cloud environments, leveraging Software-as-a-Service (SaaS) or Platform-as-a-Service (PaaS) offerings where appropriate.
4	Re-use before Buy before Build	Leverage, acquire, develop: first - seek to re-use existing internal components or services. Second - evaluate commercial off-the-shelf (COTS) products; only as a last resort, undertake custom development.
5	Automate and Self-Serve	Applications and processes should be designed to automate repetitive tasks and empower users (both customers and Caledonian MacBrayne colleagues) to perform actions independently, reducing manual effort and improving efficiency.
6	Build to Scale	Key applications must be designed and implemented with the inherent ability to handle increasing workloads, data volumes, and user numbers without requiring significant re-architecture or experiencing performance degradation.
7	Driven by Data	Data is a strategic asset and must be managed through applications with high quality, security, accessibility, and clear governance to drive informed decision-making, enhance services, and foster transparency.
8	Architect for Agility	Design and build applications and systems to be adaptable, easily modified, and capable of integrating new capabilities or responding to unforeseen changes with minimal disruption and cost.
9	Secure by Design	All applications must be designed and implemented with security and operational resilience as fundamental, non-negotiable requirements, protecting against threats, ensuring data integrity, and enabling rapid recovery from failures or attacks.
10	Ecosystem Integration	Applications and systems must be designed to seamlessly integrate with internal and external partners, fostering a connected transport ecosystem and enabling efficient data exchange to deliver a holistic service.

5 Technology transformation - strategic technology projects

The journey to achieve our technology strategic vision requires a focused technology transformation programme. Within this programme there are a series of key projects, which are detailed below.

Data strategy enablement and analytics

We have set out our Corporate Plan, which detail how we will deliver the CHFS3 contract, through four key priorities:

- Reliable and Resilient.
- Accessible
- Integrated.
- Environmental impact and low carbon.

To underpin these priorities - data, and the knowledge derived from that data, are critical. A revised Data Framework will be established to facilitate the organised collection, secure storage, and efficient access to data assets, supporting business areas in making informed decisions.

To deliver this, we will:

- Create and maintain a Data Strategy covering five key themes:
  - Leadership, strategy and culture.
  - Information and data governance.
  - People.
  - Processes.
  - Technology.
- Demonstrate regulatory compliance and cyber resilience, building trust and improving credibility with external stakeholders, including the public.
- Build a deeper understanding of the power of data and broaden our focus.
- Design, build, develop and support an Enterprise Caledonian MacBrayne data platform for operational and passenger data.
- Ensure easy access to reliable data and information, supporting better operational and strategic decision-making at the different levels across Caledonian MacBrayne.
- Provide greater operational efficiency around data and information, resulting in less manual checking, duplicated work and auditing of outputs.
- Improve data governance and quality.

- Enable improved predictive analytics (e.g., demand forecasting and capacity modelling).
- Support regulatory reporting and performance dashboards.
- Establish the foundations needed to be able to innovate and benefit from more advanced uses of data, including machine learning, big data and AI.

Measures of success

- Enterprise Data Platform fully implemented and all core applications entered the Enterprise data platform by end FY 27/28.
- Caledonian MacBrayne will be independently assessed for Data Maturity according to the Central Digital and Data Office (CDDO):
  - Level 2 Emerging FY 27/28.
  - Level 3 Learning FY 28/29.
  - Level 4 Developing FY 29/30.

Improved data governance

Data Governance Category	Measure	Target
Data ownership and stewardship	% of data domains with assigned data owners and stewards.	Tier 1 data assets have defined accountability.
Metadata Management	% of business-critical datasets documented in data catalogue.	Full coverage within 18 months.

Data technology

Data Technology Category	Measure	Target
Architecture Modernisation	% of core data sources integrated into the central platform by end FY 27/28.	% of Enterprise systems feeding into data warehouse/ lake.
Platform Stability	% successful scheduled data pipeline runs.	Success rate (%).

Data operating model

Data operating model category	Measure	Target
Target Operating Model	Data team build and transition complete.	Completed July 26.
Resource Alignment	Ratio of data projects delivered on time vs planned.	On-time delivery.

Team Productivity	Average delivery cycle time (from request to insight).	Reduced vs baseline.
Strategic Alignment	% of data initiatives linked to corporate objectives.	All active projects.

Wider Caledonian MacBrayne Impacts

Measure	Target
Increase in self-service analytics usage.	Increase in active monthly users.
Time saved on manual data preparation.	No of hours/month efficiency gain.
Data-related risk reduction,	Reduced data incidents.

IT Infrastructure modernisation

We need to mature and modernise our IT infrastructure capability across architecture, platforms and operations to meet the reliability, security and scalability demands in the Caledonian MacBrayne Corporate Plan. Without modernising our infrastructure foundations, we carry structural risk in resilience, cyber security and delivery.

We will seek to partner with technology partners to provide outcome-based managed service provision but ensure we have clear infrastructure architecture guardrails and operational principles to ensure consistent resilience, security and scalability.

To deliver this, we will:

– Develop a Target State IT Infrastructure Architecture.

– Migrate from legacy systems hosted on premise to cloud platforms.

– Adopt Infrastructure as Code (IaC) for consistency and repeatability.

– Implement the principles of Site Reliability Engineering (SRE) led operations to improve reliability and faster delivery of technical change.

– Strengthen resilience using modern networking.

– Implement automation including in provisioning and patching.

Measure of success

– IT Infrastructure Architectural integrity.

– Modern infrastructure accelerating delivery e.g. requests to production ready environment and % infrastructure provisioned as code.

– Improved technology operational maturity – move from reactive support to engineering reliability.

– Improved technology service resilience.
– Strengthened IT infrastructure cyber posture.
– Optimised IT Infrastructure (cost efficiency & financial transparency).
– Automated infrastructure build and deployment.

Security and compliance

Cyber security is fundamental to trust and Caledonian MacBrayne's operational continuity.

Good cyber security, aligned to a leading industry framework i.e. NIST, means building and deploying structured capabilities across risk identification, preventative controls, real-time detection, disciplined response, and engineered recovery – all governed through measurable risk management and continuous improvement.

To deliver this, we will:

– Build a security-centric culture across technology and the wider Caledonian MacBrayne operation.
– Gain and maintain industry certifications including Payment Card Industry Data Security Standard and Cyber Essentials Plus.
– Embed security into design, development and deployment processes.
– Build a clear Identity and Access Management strategy and operational practices.
– Strengthen access, encryption, asset management, and monitoring.
– Partner with a managed security services provider to provide support for continuous threat assessment, threat identification, security monitoring and incident response.

Measure of success

– Cyber security embedded in Caledonian MacBrayne's governance and risk integrated accurately into the Caledonian MacBrayne risk register.
– Monthly board level cyber security reporting.
– Zero critical vulnerabilities open beyond service level agreement.
– Security embedded in design and delivery lifecycle.
– Declining phishing simulation failure rate trend.
– Audit findings trend (declining severity and time to close finding).
– Reduced mean time to detect (MTTD), mean time to contain (MTTC) and mean time to recover (MTTR).
– Lowering of security incidence recurrence rate.

- Majority of cyber events are auto detected.
- Successful annual Cyber Essentials plus and PCI certification.
- Tested recovery to service within Recovery Time Objective (RTO) and Recovery Point Objective (RPO).
- Frequency of cyber security exercises and effectiveness scoring.

Modernise application portfolio

Our current technology application landscape has been identified as a critical area for our operation, and we are committed to investing. The CHFS3 award presents a unique and timely opportunity for us to fundamentally modernise the foundation and to take advantage of modern technologies to improve the service.

To do this, we will:

- Create a five-year Application Strategy. This will provide strategic clarity in providing a unified vision for Caledonian MacBrayne's application estate, directly supporting our corporate strategy and our enhancement and change plan.
- Reduce operational risk with legacy applications. Mitigate risks associated with legacy systems, data silos, and fragmented processes through a balance of tactical improvements and application replacement - aligned to the Application Strategy.
- Develop a clear Application Target Architecture.
- Continue to invest, develop and improve our eBooking and ticketing suite of applications.
- Work with public sector transport providers to introduce Smart Integrated Ticketing as defined in the Smart and Integrated Ticketing Delivery Plan final-smart-integrated-ticketing-delivery-plan.pdf
- Clarify the business areas/functionality where we see the best for buy versus build.
- Introduce the concepts and principles of product management to build an enduring customer centric ethos of continuous improvement.
- As part of the Application Strategy, align plans on modular platforms versus best of breed solutions.
- Adopt API-first architecture for integration.
- Execute a series of projects to procure, design and deploy the Caledonian MacBrayne Application Strategy.

Measures of success

- % of strategic business capabilities enabled by modernised platforms.
- % of applications aligned to target architecture principles.

- % of applications on supported technology stacks.
- Availability by application tier.
- Clear application lifecycle management process.
- Simplified integration landscape (% reduction in duplicate capabilities).
- Remove application technical debt (increase then eliminate legacy system decommissioning).
- Measurable productivity gains across Caledonian MacBrayne operations.
- Reduction in manual workarounds to conduct business processes.
- Improved customer and employee journey metrics.
- Reduced time to launch new technology, digital and data products.

6 Technology governance and delivery model

In addition to the technology corporate governance which takes place across Caledonian MacBrayne, ensuring technology decisions are made, monitored and assured across the organisation - as part of CHFS3 we will introduce our Technology Strategy group.

Technology Strategy group (TSG)

Purpose:

- The Caledonian MacBrayne Technology Strategy group (TSG) is a strategic advisory forum established to provide collective challenge and input in relation to the business's Technology Strategy and strategic technology direction.
- The TSG supports Caledonian MacBrayne to:
  - Take a coherent approach to technology.
  - Ensure our technology investment and priorities align with Ministerial priorities, our Corporate Plan and public value.
  - Identify and manage strategic technology risks, dependencies and opportunities.
  - Strengthen engagement between Caledonian MacBrayne technology and Scottish Government policy, and service users.

The TSG operates as part of our wider corporate governance framework and does not replace formal executive and CFL decision-making bodies.

Membership:

Chair

- Caledonian MacBrayne IT Director.

Core Members

Senior representatives from Caledonian MacBrayne technology drawn from:

- IT Infrastructure and Operations.
- IT Products and Services.
- IT Governance.
- Information Security / Data Protection.
- Caledonian MacBrayne Data Leadership.

In attendance:

- Scottish Government.
- User Communities via two representatives proposed by the Ferry Community Board (FCB).
- Transport Scotland Ferries Directorate.

A detailed RACI outlining TSG interactions with other Caledonian MacBrayne governance forums is included in Appendix 1.

Introduction of the Technology Products and Services Team

To support the delivery of technology products and services with greater pace aligned to customer needs, we have introduced and are building Technology Product and Services Team which is aligned to outcomes rather than activities.

This means:

- Products and services are defined by how they are consumed, not by internal systems, platforms, or teams.
- Each product team owns the end-to-end customer experience, including delivery, operation, and continual improvement.
- Tangible benefit and customer outcomes guide prioritisation and decision-making, ensuring effort is focused on what creates real value.
- Teams are empowered to act within clear guardrails, enabling fast, informed decisions as context and customer needs change.
- Cross-functional collaboration replaces silos, accelerating learning, innovation, and time to value.

Delivery principles

We will:

- Adopt agile delivery practices.
- Use data-informed decision-making.

– Work transparently with stakeholders.

– Continuously test and iterate services.

The four domains of the technology products and services team

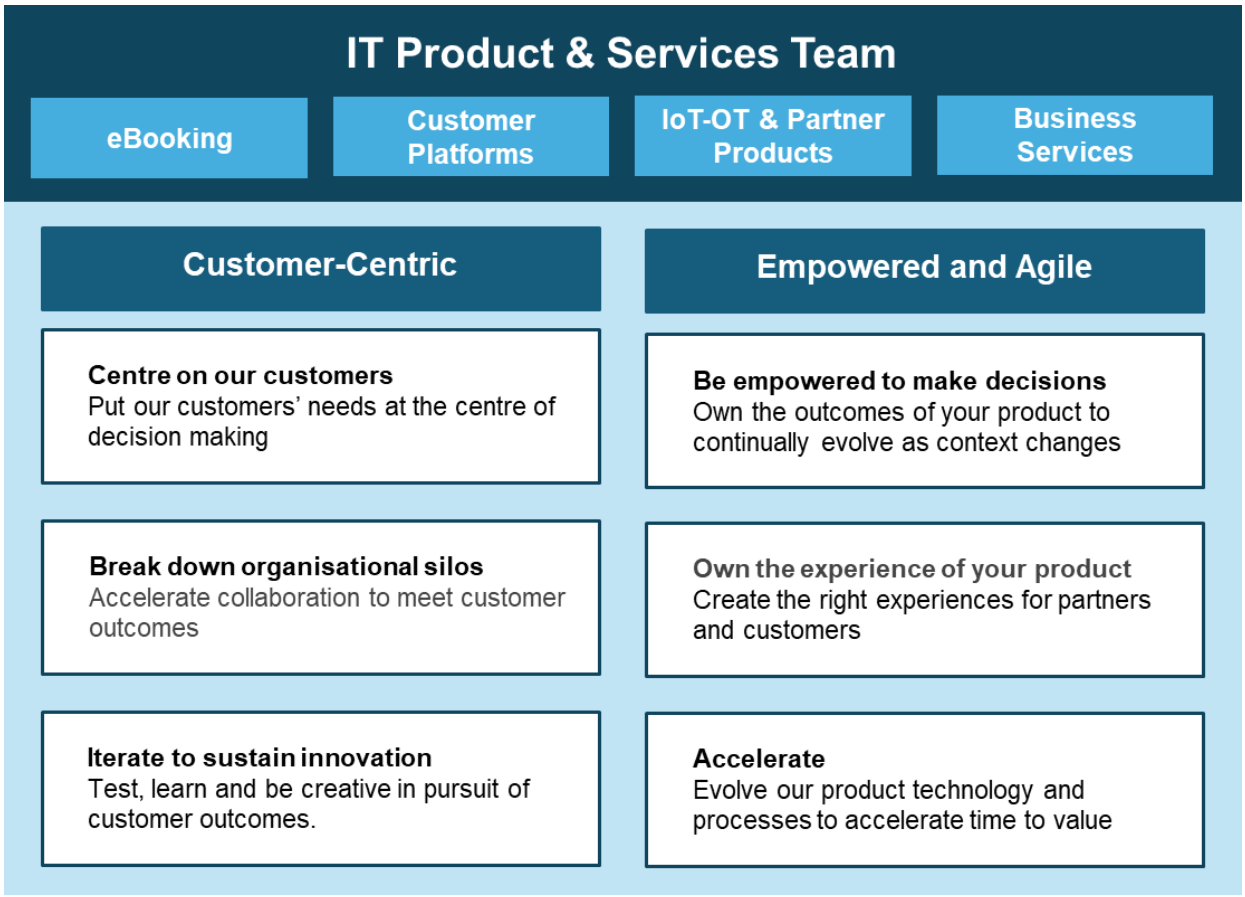
The Technology Products and Services team has four key domain areas of focus-:

– eBooking products.

– Customer platforms.

– Internet of Things (IoT), Operational Technology (OT) and Partner Products.

– Business services products.



Technology products and services team outcomes

Outcome 1: Measurable customer and operational value

– Deliver products and services that improve customer experience and Caledonian MacBrayne operational efficiency.

– Prioritise focus areas by tangible benefits and real-world outcomes rather than internal structures or technology preferences.

– Explicit and tracked benefits realisation which are reviewed within Caledonian MacBrayne corporate governance.

Outcome 2: Higher throughput, outcome led change, delivered in a controlled manner

– Identify, evaluate and prioritise change, which is delivered through a repeatable governance model.

– Outcome-led product backlog aligning business demands with delivery capacity.

– End to end delivery is owned by Technology Product teams - from idea through live operation and improvement.

Outcome 3: Reliable and resilient digital capability that scales.

– DevOps practices embed resilience, security, and quality into the delivery lifecycle. Release quality is improved, failures reduced and recovery time is enhanced.

– Deployment pipelines are automated, built, tested to enable faster, more predictable releases with minimal operational disruption.

– Cloud-native, cost-optimised platforms delivered to provide flexibility to scale services as demand evolves, without introducing single points of failure.

7 Conclusion

The Caledonian MacBrayne Technology Strategy and delivery plan sets out how technology will enable us to deliver safe, reliable, accessible, integrated and customer-focused ferry services for the communities we serve. Technology and our digital capability are fundamental to how passengers plan journeys, access information, experience our services and trust our organisation.

Over the coming years, we will modernise our technology infrastructure and applications, strengthen cyber resilience, improve data-driven decision making, and simplify our technology estate to ensure we are efficient, secure and future-ready. Our focus is on building a resilient digital foundation that supports operational excellence, enhances passenger experience, and enables innovation in a rapidly evolving transport landscape.

We are committed to investing responsibly, managing risk rigorously, and ensuring that every technology decision delivers tangible value — whether through improved service reliability, better real-time information, enhanced accessibility, or reduced environmental impact.

Technology is a critical enabler of our wider Caledonian MacBrayne Corporate Plan – and the priorities within it. By aligning our technology and digital investments with our operational priorities and long-term vision, we will ensure that our ferry and port network remains dependable, sustainable and responsive to the needs of the public.

This Technology Strategy is not the end point, but a foundation for continuous improvement — supporting our people, our partners and our passengers, today and into the future.

Appendix 1 – RACI – Technology Steering Group (TSG) Interaction with other Caledonian MacBrayne Governance Forums

Activity/Decision Area	TSG	Calmac IT Director	Calmac Executive Management Team & Board	Calmac Portfolio Board	Calmac Audit & Risk Committee
CalMac Technology Strategy Development	C	A	C	I	I
CalMac Technology Strategy Approval	C	R	A	I	I
CalMac Strategic Technology Priorities	C	A	C	C	I
Major CalMac Technology Investment Proposals	C	R	C	A	I
Technology Portfolio Prioritisation & Sequencing	C	R	C	A	
Strategic Technology Risk	R	A	C	I	C
Alignment With Scottish Government Strategies	R	A	C	I	I
Escalation Of Strategic Technology Issues	R	A	C	I	C