United Kingdom
Hydrographic Office

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Taunton
Somerset
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Telephone:
E-mail:
Website: www.gov.uk/ukho

REF: FOI2017/02415   13th April 2017

Dear ██████,

Thank you for your email of 16 February requesting the following information:
I would like to submit a freedom of information request for the following document relating to the following:

ICT Documents
1. ICT Strategy- I require the document that hold future plan and strategy of the organisation's ICT department.
2. ICT Departmental Business Plan
3. ICT Technical Strategy.
4. ICT Structure
5. ICT Capital budgets and programmes

Can you please provide me with the latest document to date the organisation holds and please state this within the response. If no information is provided, I will contact the organisation back to verify that this is the latest version of the document.
AN example of this would be an ICT strategy 2012-2017, in some cases, this is acceptable, but on the foot of the document, it states 2012. We require the latest documents; please communicate this to the information holders.

If the organisation doesn't have a document that covers the current financial year, please provide me with information (month) on when this document will be published or updated. In the response please provide us with the previous document along with publish month of the future document.
If you feel that your organisation or the department hold other documents that relate to my request or the document above please send them accordingly.

Some organisations within the region may title the document something else, which includes IM&T Strategy, IS Strategy, Technology Strategy and ICT Strategic Plan.

Lead member: Cabinet Member for ICT and Telecommunications come under. Please can you provide me with their direct contact details including their Full Name, Actual Job Title, Contact Number and Direct Email Address?
Can you please provide me with a direct link to this committee?

I am treating your correspondence as a request for information under the Freedom of Information Act 2000 (FOIA).

I apologise for the amount of time it has taken to respond to your request. The search for the information has now been completed within the UKHO and I can confirm that information in scope of your request is held. In the course of locating and assessing the information you have asked for, we have been as thorough as possible.

The information requested is held within documents which are sensitive, both in terms of our Defence and commercial work. Therefore, we have to withhold some of the information relating to your request; the exact reasons for doing so are below. It is important to bear in mind the role of the UKHO and how it fits within Government. We are a Trading Fund of the Ministry of Defence and have a requirement to deliver products and support to Defence customers. As a result, many of our systems and processes are sensitive and cannot be disclosed in order to maintain their integrity and security. The specific responses to your request are as follows:

1. ICT Strategy- I require the document that hold future plan and strategy of the organisation's ICT department. – **This document has been attached to this email, with redactions as explained below**.
2. ICT Departmental Business Plan – **This is covered in the document at point 1**
3. ICT Technical Strategy. – **This is covered in the document at point 1**
4. ICT Structure – **This has been supplied as an attachment to this email**
5. ICT Capital budgets and programmes – **This is covered in our Corporate Plan document that we were previously unable to provide to you due to the amount of sensitive commercial and Defence information within it. However, you may find it helpful to note our comments under Section 16 of the Act, below.**

Section 40(2) has been applied where names of staff were given, in order to protect personal information as governed by the Data Protection Act 1998. Section 40 is an absolute exemption and there is therefore no requirement to consider the public interest in making a decision to withhold the information.

We have withheld some of the documentation requested under the exemptions provided for at sections 24 (National Security), 26 (Defence), 27 (International Relations), 28 (Relations Between The UK's Administrations), 29 (Economic Interests of UK) and 43 (Commercial Interests) of the FOIA. These are qualified exemptions which means that the information requested can only be withheld if the public interest in doing so outweighs that of disclosure.
Following thorough Public Interest Testing, the Corporate Plan document has been entirely withheld. The Technology Strategy 2016-2021 document has been redacted as per the points below:

Section 24 has been applied to some of the information because it contains details which would prejudice national security. The balance of public interest was found to be in favour of withholding the information given that, overall, the public interest is best served in not releasing any details that would prejudice the security of the UK and which would provide advantage to our enemies. We have considered it necessary to apply the lower level of prejudice against release of the exempt information at "would be likely to" rather than "would".

Section 26 has been applied to some of the information because it contains details which are operationally sensitive and would prejudice our capability and effectiveness in supporting our armed forces. The balance of public interest was found to be in favour of withholding the information given that, overall, the public interest is best served in not releasing any details that could provide tactical advantage to our enemies. For these reasons we have set "would be likely to" as the level of prejudice against release of the exempted information.

Section 27 has been applied because some of the information has the potential to adversely affect relations with our international partners. The public interest test concluded that whilst release would increase public understanding and confidence in the relations the UKHO has with international Hydrographic Offices, the balance of the public interest lies in withholding the information. We have considered it necessary to apply the higher level of prejudice against release of the exempt information at the higher level of "would" rather than "would be likely to".

Section 28 has been applied because some of the information has the potential to adversely affect relations with our UK Government partners. The public interest test concluded that whilst release would increase public understanding and confidence in the relations the UKHO has with other

government departments, the balance of the public interest lies in withholding the information. We have considered it necessary to apply the higher level of prejudice against release of the exempted information at "would" rather than "would be likely to".

Section 29 has been applied because some of the information has the potential to adversely affect the economic interests of the UK and the financial interests of a number of its administrations. The UKHO is an organisation that generates a profit; the release of information that prejudices its ability to operate for this purpose is ultimately against the UK's economic interest. The balance of the public interest therefore lies in withholding the information. We have considered it necessary to apply the higher level of prejudice against release of the exempt information at "would" rather than "would be likely to".

Section 43 has been applied because some of the information has the potential to prejudice the commercial interests of the UKHO. The UKHO is an organisation that returns a dividend to the public purse and has to operate as a commercially viable entity; the release of information that prejudices its ability to operate in this way is against the public's interest. The balance of the public interest therefore lies in withholding the information. We have considered it necessary to apply the higher level of prejudice against release of the exempt information at "would" rather than "would be likely to".

However, under Section 16 of the Act (Advice and Assistance) I am able to advise you that almost all of the information that you have requested as part of the Corporate Plan document is available for the last financial year in our Annual Report. Unlike the Corporate Plan which is based largely on projections, this document has been audited for accuracy. This can be accessed via: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/539364/UKHO_Annual_Report___accounts_2015-16.pdf

If you are not satisfied with this response or you wish to complain about any aspect of the handling of your request, then you should contact me in the first instance. If informal resolution is not possible and you are still dissatisfied then you may apply for an independent internal review by contacting the Information Rights Compliance team, 1st Floor, MOD Main Building, Whitehall, SW1A 2HB (e-mail DDC-FOI-Publishing@mod.uk). Please note that any request for an internal review must be made within 40 working days of the date on which the attempt to reach informal resolution has come to an end.

If you remain dissatisfied following an internal review, you may take your complaint to the Information Commissioner under the provisions of Section 50 of the Freedom of Information Act. Please note that the Information Commissioner will not investigate your case until the MOD internal review process has been completed. Further details of the role and powers of the Information Commissioner can be found on the Commissioner's website, http://www.ico.org.uk.
Yours sincerely,

UKHO Secretariat

United Kingdom Hydrographic Office

Technology Strategy 2016-2021

Ref 601

Document Owner: John Humphrey, Acting Chief Technology Officer

Name	Role	Date reviewed	Version reviewed
John Humphrey	Acting CTO		V8.3
██████	████████████ ████		V8.3
████	██████		V8.3

1 CONTENTS

2 EXECUTIVE SUMMARY

Our technology estate has built up over years on a piece by piece basis, without any overarching strategy. The result is:

- Expensive,

███████
███████

This ad hoc approach was exacerbated by a project mentality that did not sufficiently recognise – either in skills or budgets – the need to develop and maintain systems. This meant, in addition to the problems highlighted above, our estate:

- Drifted from business requirements,

███████
███████
███████

Examples include:

- ███ where at one point we were spending ████████████
███████████████
- ███ where a core system was assembled by ███ from proprietary components ███ ████████ and left us dependent on ███ for service and support, and
- Our desktop estate that, until recently, consisted of a ████████████
███████████████
███████████

Almost no thought was given to business resilience ████████████
███████████████

███████ As we move from being a product led, paper organisation to a data led, digital one this is no longer sustainable.

This document sets out how the Technology Division will support the overall organisation by:

- Creating a modern and resilient, infrastructure which addresses our legacy estate, prevents further technical debt accumulating, facilitates our productivity and supports flexible working,
- Providing the technology principles, methods, programmes and governance framework to deliver quickly and effectively across the business while maintaining interoperability, maintainability and consistency,
- Recruiting, developing and retaining a skilled, experienced and motivated technology workforce to deliver our plans, and
- Transitioning all of the above to our new building with minimal disruption.

In addition to Technology's programme, ███ has two dedicated strategic themes with a significant technology content; the Data Engine and the Working Environment. The delivery of these themes is covered elsewhere.

3 KEY ASSUMPTIONS, RISKS AND OPPORTUNITIES

The following table outlines the key assumptions, risks and opportunities that have shaped this plan:

███████████████████████████████

███████████████████████████████

Assumptions   ████████████████████████

Risks   ████████████████████████

Opportunities   ████████████████████████

B. The UKHO will remain a MoD trading fund.

We will remain a MoD trading fund requiring us to comply with all relevant policies including, for example, procurement, security, information assurance and risk management. We also need to comply with wider Government policy, guidance and regulations including pay and recruitment.

Assumptions	• We will comply with all relevant policies, guidance and regulations except where our business requires and our freedoms allow local policies to be adopted. • Our public task is our primary focus and, in so far as there is any risk of disruption to our public task, we are risk adverse and cautious. • We will operate our key services and systems on a 24/7/365 basis.
Risks	• Adhering to wider policies may slow the delivery of key outputs or increase our costs, making us less competitive. • Bound by government restrictions, especially on pay, we may be unable to attract and retain the skilled people we need to deliver our transformation. • Risk adverse decision-making may make us slow or incapable of meeting new customer demands and may make us less competitive. • We may come under pressure to consolidate with other agencies, such as

DGC, that may disrupt or delay our corporate transformation.

| *Opportunities* | • We can adopt existing policies and procedures, thereby, saving time and effort.
• We can take advantage of wider initiatives, such as the MOD apprenticeship schemes, to help us recruit, develop and retain the skilled digital resources we need. |

C. The UKHO will remain profitable and increase productivity

Delivering our public task whilst funding our transformation to maintain our sustainability is our first priority. Maintaining our service and output is key to our success but the transformation of our market to digital services significantly reduces our margin. Therefore, we have to lower our costs whilst continuing to meet the changing demands of our customers and actions of our competitors.

| *Assumptions* | • We will continue to our reduce costs by 5% YoY.
• We will have to meet new customer and competitive demands.
• We must continue to operate at a ROCE of 9%. |

| *Risks* | ███████████████████████████ |

| *Opportunities* | ███████████████████████████ |

D. We will move into a new office without disrupting business.

We will relocate into our new building in 2018.

| *Assumptions* | • The modernisation of our technology estate and the processes and approach to ensure that it stays up-to-date will have been completed and embedded before we move.
• The new building will be equipped to accommodate the new technology infrastructure, security and assurance requirements of the business. |

| *Risks* | ███████████████████████████ |

| *Opportunities* | • The new building facilitates modern ways of working that allow us to be flexible and responsive to the changing market.
• Our reputation as a modern geospatial information agency is enhanced by our new facility and helps us attract and retain skilled people. |

4 OVERARCHING POLICIES, PRINCIPLES & GOVERNANCE

In developing and delivering our strategy, we will adopt an overall policy of guiding, trusting and verifying the delivery of technology throughout the organisation through a core of overarching policies and principles:

- We will master and maintain data once.
- We will use open standards wherever they exist.

████████████████████████

████████████████████████

- We will not enter into bespoke contracts that lock us into long-term commitments.
- We will adopt Government and MoD standards wherever they exist and are applicable.
- We will use nominated technology building blocks and re-use existing code wherever possible and only acquire or develop new software and systems where necessary.
- We will use ████████████ development in order to maximise business and customer value.
- We will utilise our existing investments to the full and not proliferate the diversity of our estate unnecessarily.

These policies and principles will be supported by a new technology governance structure designed to minimise bureaucracy but still provide good levels of assurance that we are delivering new developments of high quality in line with our policies and principles.

The current lower level design approach and principles as currently adopted in the business are listed/outlined in Appendices A and B along, where applicable, with their owners under the current governance approach.

5 DELIVERY APPROACH

In developing and delivering technology:

- We will use the plan, build, run model to organise ourselves.
- We will maximise use of our existing technology stack wherever possible through our published list of Architectural Building Blocks.
- We will be prepared to vary our technology stack in order to meet specific business requirements that cannot be met with our existing stack but will resist unnecessary diversity.
- Architectural Building Blocks will be evaluated against key criteria to assist the programmes in understanding whether a Building Block can be adopted as is, whether further work is needed before adoption or whether a Building Block shouldn't be used because it is being retired or has other limitations.
- Architectural Building Blocks will be categorised as "Adopted", "In Process", "Under Consideration", "Inherited" and "Legacy". Definition and adoption of these building blocks are as follows:
    - **Adopted** – We have actively selected it, it is our preferred choice, we can support it, we can monitor it, it has appropriate commercial terms. ARB will be interested in the specific design solution but the components themselves have been pre-approved.

- o **In Process** – We have selected it, it is a preferred choice, but it is not yet fully provisioned into our services. They can be freely specified for projects but, until they are fully adopted, they must be reviewed by the ARB to ensure consistent deployment.
  - o **Under Consideration** – These building blocks are under active consideration for inclusion in our preferred technology stack. Use of these building blocks is encouraged for R&D projects. ████████████████████████

    ██

    environments without ARB approval but care should be taken not to lock them in.
  - o **Inherited** – We didn't actively choose it but we have this building block installed in at least one inherited production system. It may be adopted eventually but it has not yet been fully evaluated. Any proposed solution design using these components must be explicitly reviewed and approved by the ARB and may have operational restrictions imposed.
  - o **Legacy** – We do not promote the further use of these building blocks. They do not form part of our strategic roadmap and are actively discouraged from further use within the Enterprise.
- We will deliver technology using an abstracted, component based/service based approach that utilises a service oriented architecture (SOA) over an enterprise service bus. However, we will be pragmatic where core proprietary systems offer integration facilities we can leverage.
- We will use an integrated and automated test approach to all our software developments – including developments for core proprietary systems, ████████████████, including static analysis, nightly builds, unit testing, functional test and end-user alpha and beta testing wherever possible for all our software deliveries.
- We can configure but we will not modify or customise COTS software, for example, ████ ███████████ outside its normal operating parameters and functionality without specific ARB approval.[1]
- We will ensure that all software and system integrations are implemented using properly architected and abstracted routes and techniques including our enterprise service bus, standard APIs and, where appropriate, application specific integration tools, such as SAP PI. All service bus, non-standard, non-abstracted and closely coupled integrations must be have specific ARB and, if appropriate, ExCo approval.
- Wherever applicable and relevant our service design will adopt the standards and approaches defined in the Government Digital service Design Manual (https://www.gov.uk/service-manual).

This approach is designed to leverage our existing investments and skills and provide clear guidance to the programmes when they are selecting technology or designing an approach.

A maintained list of Architectural Building Blocks and their adoption status is located at

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████████████████████████

A partial list of Architectural Building Blocks is included in Appendix C.

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[1] Configuration means changing values that can vary across deployments, for example, URLs, server addresses, credentials, items normally bundled in property files, such as, XML, etc. If it is an immutable change to the code it is NOT configuration.

6 NEW DEVELOPMENT CHECKLIST

Irrespective of the size of development or the formal governance process applicable, all new developments will operate within the development framework provided by the Technology Production Engineering team and must, at a minimum, always consider these elements:

- **The customer/client need**. It should be clear what customers need a new software development or system acquisition meets. How has the need been established, is it wholly new or is it part of the existing backlog.
- **The business benefit**. Irrespective of the financial commitment required, does the proposed new development make sense either in terms of savings realised or profits generated. For non-strategic developments, we would normally expect a <3 year payback
- **The customer/client environment**. Wherever practicable we need to support and service any device with any major operating system and any screen size. This is particularly important for defence customers who may be more constrained than other users.
- **The solution design** with respect to the following key items:
  - **Architectural approach** - does the proposed solution respect our principles of decoupled services using existing code, open source or COTS components first. **Is the solution sufficiently scalable for the application?**
  - **Data management and integrity** – does the proposed solution respect the principle of mastering data once and reusing it many times? Is the integrity of our data preserved or compromised.
  - **Delivery platform** – have we fully considered the pros and cons of on-premises or cloud-based approaches to the specific solution.
  - **Policy compliance** – does the design meet UKHO, MoD and wider government policy requirements, especially data protection and cyber-security?
  - **User experience design and monitoring** - has the solution been designed from the perspective of the user experience and instrumented to provide in-use data to inform ongoing support and future solution design.
  - **Minimum acceptable delivery** – the lowest level of functionality where it still makes sense to deliver the new development.
- **Stakeholder impact**. Who does the proposed new development affect? If it alters an existing system or service, do we understand all the possible users of that system and are there any potential unintended consequences?
- **Delivery strategy**. How is the delivery of the new development going to be approached – can it be sourced externally (through a procurement, partnership or other collaboration) or will it be developed in-house. If in-house, consider:
  - **Appropriate governance process.**
  - **Delivery team.**
  - **Provisioning.**
  - **Test strategy.**
  - **Deployment.**
  - Etc.
- **Life cycle management and total cost of ownership**. New systems and solutions need to maintained and developed, not just to add new functionality but also to keep them secure and maintain performance and compatibility with other systems. Are the right resources available and budgeted for the anticipated life of the development.

7 TECHNOLOGY GOVERNANCE

The current Project Governance Lifecycle is detailed in Annex D and will continue in force until replaced and needs to be followed by the programmes and verified by the Corporate Services Assurance Team.

However, it is recognised that the current governance approach:

- Is no longer aligned with the use of Agile by our programmes to deliver new technology developments, and
- Has fallen into disuse for all but the largest programme deliveries.

A new governance structure is currently being researched and developed that will reflect the use of Agile development yet provide us with sufficient assurance that we are adhering to our policies and achieving our goals. The new technology governance structure will be launched in early autumn. In the meantime, our existing governance process still applies.

Key elements of the governance structure will include:

- The business investment decision to ensure that each investment decision has a clear business rationale.
- A delivery roadmap with a prioritised backlog, a defined minimum viable product or minimum useable product and a clear product owner.
- Consideration of associated, non-technical aspects, such as resourcing and procurement.
- Technology practices that will define the standards within their relative areas of expertise, including:
  - Software Engineering,
  - Business Analysis,
  - Solution Architecture,
  - Project Management,
  - Security, and
  - IT Infrastructure
- Metrics, providing visibility to technology production engineering which will help support improving performance of processes, teams as well as improving quality. Metrics will be defined at various levels, such as:
  - Percentage of tests automated and at what level (unit, acceptance, UI),
  - The length in time of integration testing for products (identifying and challenging tightly coupled systems or where there is a lack of automation around interfaces),
  - Design defects (where a bug is due to the design not meeting the requirements),
  - Defects spotted in 'pre-prod' (identifying where testing has not been thorough enough downstream),
  - Defects spotting in live (identifying where testing has not been thorough enough downstream and have now impacted business operations), and
  - Changes introduced that caused incidents (visibility of the impact of change on business operations)
- The integrated test strategy and the delivery route to live.

The defining approach for the new governance structure is summed up as – **GUIDE, TRUST and VERIFY**.

8 TECHNOLOGY THEMES

Utilising the same general principles and approach, and based on the consideration of our key assumptions, risks and opportunities above, the Technology Division will address the following key themes within its own programme:

LEGACY. Retiring **our legacy** systems in a way that minimises the disruption and cost to our day-to-day business to minimise the risk and costs to the business ████████
████████

MODERNISATION. Updating our platform to provide a modern, flexible, high performance and resilient infrastructure that incorporates the latest technical advances and is cost-effective and maintainable and supports an innovative business culture and enables flexible working patterns, such as, agile teams and remote access.

FRAMEWORK. Creating a comprehensive framework that enables and facilitates the rest of the organisation to deliver at scale by specifying a defined technology stack, standardised development methods, common tools and governance structures, etc.

WORKFORCE. Building a digital workforce o an improved environment that fosters better ways of working and a culture of achievement and delivery in a way that meets the needs of the business and the individual so that we recruit, retain and sustain a modern technology workforce.

NEW BUILD. Moving our technology into the new office in a way that causes minimal disruption to the business.

9 TECHNOLOGY PROGRAMME

Below is a summary of 5 year plan and implementation strategy split into the divisional themes. A more detailed roadmap with timing for 16/17 can be found in Annex E.

Theme	Key tasks
Legacy	• Conduct a full audit of our existing legacy systems and produce a prioritised plan that will phase and manage the removal of those systems. • Allocate dedicated resource to the support and maintenance of the existing estate to prevent the creation of further technical debt. • Introduce a lifecycle management system to standardise the implementation, maintenance and retirement of systems
Modernisation	• Implement 'Innovation Afternoons' providing experts with the time to investigate new technologies and potential business benefits. • We will review our logical and physical network design to provide the appropriate separation between commercial and defence operations to allow an appropriate balance between flexibility and security. • We will implement a Virtual Desktop Infrastructure, which together with existing solutions, will complete our portfolio of end user computing solutions enabling flexible and cost effective computing to support our workforce strategy. • Implement & enhance tools to deliver modern ways of working such as WiFi, Lync and SharePoint to enable staff to work flexibly and increase responsiveness • Removal of the internal market and IT spend centralised under new governance so that assets are managed and optimised.

	• Adopt Cloud first strategy to migrate all services to cloud based services, either where compelling events such as product change facilitate or by actively addressing and migrating our on premises estate.	
Framework	• Standard Technology principles set to provide consistent guidance and governance across the business. • Implement new Agile governance and maturity indices to further embed the agile approach to development. • Implement engineering principles to provide consistent guidance and direction across the business for software engineering. • Launch new Test governance and maturity indices to provide consistency and develop our ability to test across all deliverables. • Identify and deliver common services that will deliver centrally a range of consumable services that can be utilised by all product and provide consistency and cost savings across our product range. • Review of IT security function to ensure that we have the appropriate functions and skills to ensure that we maintain our security accreditation and appropriate security posture.	
Workforce	• Launch a Technology L&D programme, exploiting existing career frameworks, such as SFIA+, that covers all the key professions within the Technology Division. • Deliver an annual Technology Skills away day to keep staff up to date with technological developments, celebrate skills and success and encourage a learning environment. • Work with HR and the MoD to build a pipeline approach to new skills that recognises our inability to pay market rates but provides a compensating offer that allows people to come into the UKHO, do interesting work and deliver value whilst developing skills that then go back out into the private sector after 4 to 5 years.	
New Build	• Conduct an analysis of other data centre moves, best practice Agile work space and technological support for modern ways of working to ensure that the technology requirements of the new office are fully identified. • Work with the new build project team to ensure that all technological aspects of the move are planned and implemented successfully.	

10 ORGANISATION
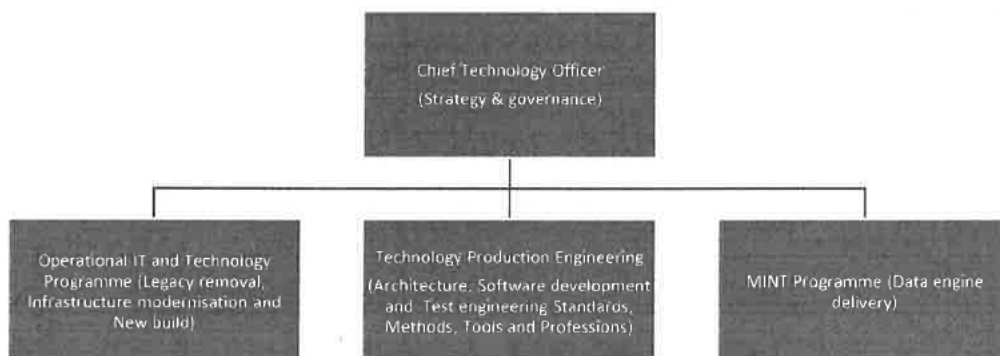
ANNEX A – CURRENT LOWER LEVEL TECHNOLOGY APPROACH

Client Facing Tier (Web & Mobile)	• Browser independent apps based on ████ for web & mobile clients. • Avoid proprietary tools inc. ActiveX, Flash & Java • Client side designs work for all clients and support mobile and full desktop footprints. • ████████ utilised for all internal clients.

Middle Tier (Business Logic)/ Service Architecture	• Performance and interoperability are key design outcomes
	• Common services will be used for:
	  – Authentication and Security Administration
	  – Integrated Service Bus
	  – Content Management
	  – Business rules management
	  – Billing and pricing
	  – Analytics and Reporting

Back End Tier (Data)	• ████ databases (for legacy applications) are hosted ████████ • Database platforms will be shared across all products • Database type will depend on business requirement but will default ████████ for new applications
Cloud Platforms	• No significant additions or expansions to internal datacentres • Focus on Platform as a Service (PaaS) • Hosted Software as a Service (SaaS) preferred before host on premises • Cloud platform selection based on primary development stack. • Apps designed to scale horizontally • Apps developed to support cloud migration • Private cloud tech deployed using ████████ • Email services ████████. Hybrid cloud/premises design considered • ████████ on hybrid cloud/ premises platform • Create hybrid/ on premises ████ platform. • Review disaster recovery with cloud in mind
Collaboration & Communication	• Exploit Skype for Business • Identify external collaboration channels and federate • Minimise use of email outside of formal or contractual comms • Promote cultural change underpinned by technology • Ensure building facilities designed to optimise collaboration
Network Connectivity Internal/ External/ Logical	• Achieve return on previous investments • Logical separation between security domains to simplify ████████ • SMI connectivity only to required networks ████████ • ████████
Authentications and Access Controls	████████ • ████████ will be fully implemented to simplify administration

- Multi-factor authentication

DevOPS/ Service Provisioning	- All provision is automated. - Self –service provisioning to support rapid development - Configuration management needs to be matured within 12 months 'Showback' charging adopted - Applications can be monitored through metrics - Review current infrastructure focussed monitoring platform ■■■■■■■ against alternative and desirable application monitoring platform ■■■■■■■
Compute – End User Devices	- Flexible user experience based upon use cases - Multiple end user device types – Phone, tablet, thin client, PC ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■ ■■■■■■■■■■■■■■■■■
Compute – Server Infrastructure	Abstract Hardware layer through virtualisation using ■■■■

ANNEX B – CURRENT LOWER LEVEL TECHNOLOGY PRINCIPLES

1.Enterprise Principles (To be owned by the EAG)

Convergence with the enterprise architecture	The convergence with the enterprise architecture is promoted in the right time within the project lifecycle, and in line with the company's investment strategy. Taking place as new applications are built, new technologies implemented, and older systems updated or decommissioned. Exceptions can be supported for if there is a consensus that benefits of using a solution exceed those arising from the adoption of the enterprise architecture.

2.Business Principles (To be owned by the Business Analysis Practice)

IT and business alignment	Information management decisions support the changing business as an enterprise in to generate maximum benefits for the company as a whole. Changes should look to improve the existing performance and efficiency of processes.
Maximise benefits at the lowest costs and risks	Strategic decisions for solutions must always strive to balance benefits generated for the business against the lowest long-term risks and costs.
Adoption of the best practices for the market	IT activities must always be aligned with the best practices for the market regarding IT governance, processing, and management.
Business Continuity	Corporate activities must be maintained, despite system interruptions.
Conform to defined standards that promote interoperability for data, software and hardware.	Corporate information management processes must comply with National and International standards, internal \ external policies and regulations (Designed for Flexible Interoperability).
Compliant with National and International legislation	The UKHO is subject to a variety of legislation, both National and International. Examples of legislation that must be considered by ICT projects includes such legislation as: - SOLAS obligations - Data Protection Act - Public Records Acts - Freedom of Information Act - Legislation covering the disposal of ICT such as the WEEE directive - Licensing (e.g. Software) - Equal opportunities legislation, including disability discrimination - Climate Change and its associated targets for sustainable ICT across government, the introduction of Carbon Accounting, Sustainable Operations on the Government Estate (SOGE) and Sustainable Development in Government (SDiG) targets. - Health and Safety legislation.
Protection of Intellectual Property	Software and information shall maximise the IP of these artefacts to ensure the UKHO can maximise their reuse and value.
Avoid over-reliance on 3rd Party Suppliers	We must factor in long-term support costs and product agility when we rely on third-parties to supply strategic capabilities.

3. Data Principles (To be owned by the EAG)

Information treated as an asset	Information is a valuable asset to the company and is managed based on this concept. Data should be data centric not product centric to facilitate cost effective data reuse.

Effective Data management	All data repositories should be clearly documented within our Register. Documentation should include data classification, data roles (including data owner), retention policies, disposal, access controls and risk assessment.
Data and Product Metadata	Data and products shall contain appropriate metadata to ensure the date lineage, reuse rights and product application.
Information is Shared	Users have access to information that is necessary for performance of their respective tasks. Therefore, information is shared between different corporate areas and positions, depending on the security levels established for that particular set of information. Users should know where to obtain the one source of the truth for any data types.
Information is Accessible	Information is discoverable and accessible for users to perform their respective duties. Information should be stored at the lowest granularity required to promote effective ownership and information re-use
Common Vocabulary and Data Definitions	Data is defined coherently throughout the company, and definitions are comprehensible and accessible by all users.

4. Application Principles (To be owned by the Software Development Practice)

Adaptability and flexibility	IT systems are conceived to generate change, and they reflect alterations in laws, social needs, or other types of changes. Adaptability and flexibility reduce the complexity and promote integration, which improves the company's business activities. Excessive customisation increases costs and reduces the ability to adapt. We should promote event driven and service oriented architectures.
Components will be designed to be developed once and used many times without constraining the need for innovation	The enterprise architecture is built over low-coupling, reusable, modular components that implement services. Systems architecture must be as simple as possible to maintain yet meet all business and corporate requirements. Whenever complexity is required, it must be encapsulated to promote simplicity and reusability of solutions built on the architecture.
Easy-to-use applications	Applications are easy to use. The technology is transparent to users, so it enables them to concentrate on their tasks, rather than on system operation issues.
Adherence to functional domains	The business rules and functionality of a system are consistent with the mission of that system. There is complete adherence to the functional domain in which the system is located.
Low-coupling interfaces	Interfaces have low coupling, are self-described, and offer low impact on the financial institution in case of changes.
Auditing and logging	████████████████████████████████████
Secure development	████████████████████████████████████

5. Technology Principles (To be owned by the Technical Design Authority)

Business strategy must	Changes in applications and technologies should be made whilst

guide all technology decisions	being cognisant of the business strategy and direction.
Reduce technical complexity and diversity	Technological complexity and diversity should be reduced to minimise costs. If they are required they shall be assessed to ascertain the through life impact.
Technological independence	Applications do not depend on specific technological options and, therefore, can function on different technology platforms. The IT architecture must be planned to reduce the impact of technological changes in the business.
Interoperability	Software and hardware must follow established standards that promote data, application, and technology interoperability.
Management of the network and its components throughout its life.	████████████████████████████████
Standard builds for IT equipment	Standard builds for workstations, servers, network equipment, firewalls, Cloud platforms, etc., should be configured to an agreed baseline document based on an appropriate industry standard hardening guide.

6. Security Principles (To be owned by the Security Practice)

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7. Solution Principles (To be owned by the Solutions Architecture Practice)

Implement principles	Solutions shall implement the Architecture and derived Divisional Principles.
Deliver the corporate plan	Solutions shall deliver the Corporate Plan and assist the programmes in meeting the corporate measures.
Security conscious design	██
Align with divisional roadmaps	Solutions shall deliver the Corporate capabilities in alignment the agreed Divisional Roadmap.
Build capabilities that consider reusability and whole life costs	The selection and procurement of UKHO ICT must consider through life affordability of the capability being delivered. It is the responsibility of the sponsor to consider the wider value for money impact of the through life changes and evolution of their capability. Examples of where project decisions may have an effect upon the Defence Enterprise include: • Designing to open standards and open architectures allowing obsolescent components to be replaced easily. • Procuring systems that use proprietary standards or have an aggressive maintenance schedule that is incompatible with the Defence ICT enterprise. • Choosing a lower cost technical solution that places significant overheads on the Network. • Choosing a lower cost technical solution that requires additional items to be put into the logistics chain or requires components to be run longer than originally intended.
Provide Data centric solutions	Solutions shall ensure data agility to meet emerging commercial needs.
Master Data Management	There is one source of the truth and information is delivered from the most appropriate source.
Data integrity	Solutions shall enforce data integrity and availability.

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Continuous Improvement	Solutions shall promote and enable a continuous improvement capability.
Reduce Technical Debt	Seek out technical debt and reduce or eliminate it. Think where it is appropriate to reuse, before buy, before configure before build so we can manage changes that could reduce or cause an increase in technical debt.
Break down silos	Don't design solutions that create duplicated processes or data stores
Always consider what is best for the enterprise	You're an architect – believe in yourself! Be pragmatic and delivery focussed, but push back against bad ideas!

ANNEX C – PARTIAL LIST ARCHITECTURAL BUILDING BLOCKS

- Key strategic Architectural Building Blocks that have been fully adopted include:

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11 ANNEX E – TECHNOLOGY ROADMAP

Theme: Technology Programme/Working Environment

An environment which mirrors our ambition to be a world leading, forward looking data-centric organisation that attracts the best talent and inspires people to contribute

Chief Information Officer

Deputy Chief Information Officer/ Head of Technology Operations

MINT Programme Manager

Head of Technology Production Engineering

Technology Operations

Business Computing Manager

Incident Management
6 FTE
- 1st Line Support
- Servicedesk
- Monitoring

Service Request
6 FTE
- Service Request

2nd Line Support
6 FTE + 2 Apprentice
- 2nd Line Tech Support
- 2nd Line Application Support

Technical Systems Team Manager

System Administrators
11 FTE
Technical Systems
- Servers
- Storage
- Networks
- Sharepoint Admin
- HDB/OPS Systems/VMS

DevOPS Team Manager

System Administrators
6 FTE
DevOPS Team
- Programme Activities
- Infrastructure Architecture

IT Security Manager

IT Security Officers
2 FTE + 1 Apprentice

Security Assessment Coordinators
3 FTE
IT Security

Enterprise Applications Team Manager

Database Administrators
3 FTE

SAP Basis Administrators
2 FTE
Enterprise Applications
- Databases
- SAP Basis
- HDB/OPS Backend

Delivery and Capability Manager

Delivery and Capability Team
6 FTE
Delivery and Capability
- Change Management
- Service Transition
- Configuration Management

Programme Manager

Business Analysts
2 FTE

Project Managers
3 FTE

Solutions Architect
1 FTE

SAP Competency
4 FTE

Sharepoint
4 FTE

Software Engineers
1 FTE

Technology Programme

Project Manage
1 FTE

Business Analysts
2 FTE

Solutions Architects
3 FTE

Software Engineers
6 FTE

MINT Programme

Software Engineering Team Manager

Software Engineers
16 FTE + 1 INTERN

Commercial Development Team

Software Engineering Team Manager

Software Engineers
17 FTE + 1 INTERN

Operations Development Team
- Operations
- Programme
- Defence Programme

Software Engineers
2 FTE

Software Engineers
1 FTE

System Support

Software Engineers
3 FTE

Application Lifecycle Management

Enterprise Architect

Architecture Standards
4 FTE

Architecture Standards
- Enterprise Architecture
- Data Architecture
- Infrastructure Architecture
- Solutions Architecture

Testing Engineering Manager

Test Analysts
2 FTE

Testing and QA