The Digital Direction for the Healthcare & Medical Operational Capability (H&MOC) Function

Navigating Our Digital Journey

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Version History

Version	Date	Changes
1	June 2023	First release
1.1	July 2023	Minor changes regarding removal of ‘strategy’ from the title of the document and any mention of this being a strategy.
1.2	July	Minor edit to include increased focus on planning, and measuring digital capability delivery.
1.3	September	Improved clarity on the Critical Themes and implications to the H&MOC Function. Mention Clinical Safety in the Drivers, Principles and Themes Inclusion of business capability model. Update to HQ DMS CDIO governance model. Improved strategic journey picture.
1.4	September	Renamed title of the document to ‘Digital Direction’ to ensure standardised naming convention across Defence Functions

Welcome

A Welcome from AM Clare Walton – Director General DMS

The Healthcare and Medical Operational Capability (H&MOC) Functional Strategy places the pursuit of maximised medical deployability and excellence in operational patient care at the very centre of what the DMS does. These first two strategic aims are underpinned by a critical third: that of becoming an exemplar, data-driven learning organisation. Our DMS Digital Framework will play a key part in helping us all deliver for Defence against each strategic aim.

The world remains dynamic and complex. To enable us to thrive and so deliver on our promises, we must be comfortable with embracing and exploiting constant change, whilst remaining focussed and indeed accelerating on our journey towards optimising our delivery of support to Defence Strategic Outcomes. We must transform the medical firm base; provide intelligence-led and data enabled force healthcare protection; deliver optimised Operational Patient Care Pathways (OPCP), provide capable and responsive strategic MEDEVAC and empower an occupationally focussed rehabilitation framework. To achieve this, we must embrace all the benefits digital technologies can offer through strengthening our Functional authority over appropriate medical digital and non-digital capabilities.

Data, information and knowledge represent our second most important assets after you, our people. Embracing digital change and unlocking the potential of Defence's emerging Digital Backbone is not something we can do without you. We must all strive to become digitally savvy, be willing to disrupt dogmatic ways of working and thinking, and so fully embrace modern digital capabilities to help deliver the best possible support to all those we serve. I know we are all ready to seize such an exciting set of opportunities and I look forward to joining you on our digital journey.

A Welcome from Eileen Jessop – HQ DMS CDIO

Our world continues to change and rapidly evolve, I recognise our operating environment is constantly transforming and we are facing ever increasing national and international challenges. To stay relevant and deliver excellent patient care and maximised medical deployability we need a strategy that will anticipate and respond to those changes.

Digital and data opportunities needs to be at the heart of all our decision making within Defence Medical Services (DMS). We need to be at the forefront of anticipating and rapidly evaluating new and existing technologies to improve the working lives of our staff through improved streamlined innovative digital services, giving them more time to care. Through digital enabled technologies, designed and in collaboration with our staff and patients we will aim to improve every patient interaction with our services, however in order to do this we need to transform.

I want to increase our collaboration with Defence Digital and industry partners, share our knowledge and expertise and draw on the learning from other health care systems to inform our development. Only then can we provide the best possible experiences, across all parts of the DMS, helping our people make the right decisions at the right time through trusted insight, driven by improved digital solutions and high-quality data.

Preface

"*A vision of a future state should provide a sense of direction, but not a deterministic goal. Once we understand complexity, we know that starting a journey with a sense of direction leaves us more open to discovering novelty, opportunities and threats that we could not have imagined in advance*."

EU Field Guide: Managing complexity (and chaos) in times of crisis (5)

Purpose

The world is increasingly complex and change is constant. Therefore, we require guidance throughout our journey from where we are today to where we want to be whilst safeguarding organisational resilience – the ability to adapt (due to 'course corrections' caused by environmental and organisational changes) whilst still delivering value.

This document creates a line-of-sight or 'golden thread' between the ENDS, defined in the H&MOC Functional Strategy and the pan-Defence strategies (Digital, Data, Cyber, AI, Technology and Information and Knowledge Exploitation) - and the enabling digital WAYS and MEANS.

This document will steer and provide the governance structure over all digital projects aligned to Defence Medical Services (DMS) and the DMS Transformation Programme.

The Digital Scope

Being 'Digital' means being customer focused, resilient to change and by ensuring we make the right decisions at the right time. We believe we can only do this through a cohered strategy bringing together the Digital, Data and Technology (DDaT), knowledge and information management (KIM) and cyber security and information assurance (Cyber IA) disciplines. See JSP441 for further information.

We recognise that people make decisions not just on information, fed from data, but also theirs and others knowledge. We also recognise, within any business, and even more so in Defence there is a security wrapper around everything we do. Therefore, to achieve our Functional Vision and Goals, we will utilise a guiding, comprehensive digital approach (providing as sense of direction), supported by a managed, prioritised and performance measured digital portfolio, and this is what will be steered by this document.

Audience

This document provides guidance and a clear signal of intent to staff and decision-makers internally across the Defence Medical Services (DMS), which includes the Front Line Commands (FLCs) as well as external stakeholders within industry, the national health services and NATO partners.

Linkages

This document replaces any previous digital, data and/or information strategies within the Function and can be seen as the Functions direct response to the Digital Strategy for Defence, including its sub-strategies for Data, Cyber and Technology.

Document Structure

Strategy is about describing your path to a specific set of business outcomes that deliver value.

This document provides an overview of the DMS Function, its Drivers and desired ENDS. However, the primary purpose is to define a digital direction (strategy and line of sight or 'Golden Thread') between what digital changes are required (our digital WAYS and MEANS) to enable those ENDS.

Document Chapters

The following 3 chapters are the remit of the Functional Strategy, but they are represented within this document for completeness and to draw out their specific digital elements:

1. **DRIVERS / CASE FOR CHANGE**
   - **Internal** - The current and future needs from Defence's internal organisation including Front Line Commands
   - **External** - The external factors impacting DMS: Political, Economic, Social, Technological, Legal and Environmental

2. **THE FUNCTION**
   - **Scope** - The scope of DMS and its unique role in Defence
   - **Vision** - The current Functional vision of the H&MOC to help steer the Digital Strategy
   - **Value Chain** - How the DMS delivers value to Defence i.e. its Business Activities

3. **ENDS**
   - **Vision & Goals** - The Digital Vision and Goals in the journey
   - **Outcomes** - The S.M.A.R.T. deliverable(s) achieved upon goal completion
   - **Capabilities** - The unique groupings of people, processes, and tools that that form DMS's value chain, that will deliver the ENDS through the digital WAYS and MEANS

The following 2 chapters represent the primary content of this document (the content of the Annexes are not covered below, but they will follow the same structure as this document).

4. **WAYS**
   - **Steering our Digital Journey** - The 8 steps we will follow to ensure we continuously head in the right direction towards our Functional Vision and Goals
   - **Critical Themes** - The Digital Approaches critical to achieving our Nudges and therefore the Functional Goals, grouped into Critical Themes
   - **Digital Governance** - The DMS CDIO governance model including digital projects portfolio management
   - **Digital Risks** - Key digital risks influencing the Digital Strategy

5. **MEANS**
   - **Tactics** - The specific and unique digital projects and programmes that will deliver the Digital Approaches. Plus where possible details of the people, process, tools, and the data, information, knowledge infrastructure required to deliver them

Contents

Drivers

'**Drivers'** are factors that apply pressure upon the DMS to change. The Drivers should be fully defined in the H&MOC Functional Strategy, but they are included here to indicate their digital implications. Drivers can expose strengths, weaknesses, opportunities and threats. External drivers are: Political, Economic, Social, Technological, Legal and Environmental. Internal drivers originate from pan-Defence digital strategies and the key user requirements. Details are in Appendix 3.

External Drivers

1. **Political** – How government controls and influences the economy or organisation
   - Example: Scalability, collaborative healthcare and strategic flexibility are defined in NATO's Capstone programme. Coupled with continuous military rotation of clinical staff inhibiting continuity.
   - Digital Impact: Removal of low value-added tasks, more efficient and effective working. Plus training and digital tools supporting knowledge loss prevention and global knowledge sharing.

2. **Economic** – How prices of products and services influence supply and demand
   - Example: Funding will continue to be an issue and level of spend scrutiny will remain.
   - Digital Impact: Reduce reliance on expensive locums to fill staffing gaps through more effective working, whilst ensuring solutions meet DMS's unique needs.

3. **Social** – How demographics and culture impact the environment
   - Example: Competition for resource is increasing due to global shortage of medical staff. Plus mass migrations are increasing due to climate change and conflicts.
   - Digital Impact: The must be an improve flow of personnel between all the services and an improved efficiency of existing staff e.g. reduce clinicians time on admin tasks.

4. **Technology** – How innovation and technology changes impact ways of working
   - Example: Rapid technological change including human augmentation, energy weapons and the 'Internet of Things' is increasing medical complexity as well as pervasiveness of information and the need to share live data globally.
   - Digital Impact: Solutions and common standards tackle interconnectivity issues with national partners and isolated forward locations and international partners. Plus we tackle the risk of information overload and ensure trusted data. The use of data and A.I. explored and bounded within ethical use cases.

5. **Legal -** How legal and regulatory environment affects policies and control employment, safety, and regulation
   - Example: Support regulatory frameworks – including but not limited to: delivery of multinational medical support, Freedom of Information, Data Protection, Clinical & Patient Safety, Medical Device Regulation.
   - Digital Impact: Allow data sharing but handle complex redaction, retention and legal hold situations across all medical data.

6. **Environmental** - How the physical environment and general environmental protection requirements impact the organisation
   - Example: Climate change may lead to increasing incidences of natural disasters, as well as the growing complex, uncertain, unsafe, hostile environments.

- Digital Impact: Increasing need to work remotely and use global communication solutions, as well as the need for staff to have a wider set of skills, increased use of tooling to fill skill gaps; lighter/smaller, more robust equipment.

Internal Drivers

The current and future needs from Defence's internal organisation including front line commands.

1. **Defence Digital Strategies -** How to comply with the pan-Defence Digital Strategies and sub-strategies as well as Defence's Information and Knowledge Management strategy. See Appendix 3.2 for further details.

    - **The pan-Defence Digital, Data, Cyber and AI strategies** clearly articulate the need to improve and the benefits an improved digital environment can provide. These are not restated in this document. This document focuses on the digital enablers in the Medical/Defence domain. Digital Strategy for Defence: 2025 and 2030 objectives:
        - People – Exploit the technology across the operational and business domains
        - Process – Drive right processes that enable and utilise the Digital Backbone
        - Data – Interoperable, standardised, machine-ready exploitable data
        - Technology – Secure technology foundation

    - **Cyber Resilience Strategy** for Defence significantly hardened to cyber-attack by 2026, and resilient to known vulnerabilities and attack methods no later than 2030.

    - **Defence Artificial Intelligence Strategy** helping enhance the speed and efficiency of business processes and support functions; increasing quality of decision-making and tempo of operations; improving the security and resilience of inter-connected networks; enhancing the mass, persistence, reach and effectiveness of our military forces; and protecting our people from harm.

    - **JSP441 Information and Knowledge Exploitation (IKX).** Recognising that technology is not the only an enabler for better decision making, we also need to capture and share knowledge and learn from experience.

2. **DMS Research and Innovation** - The principal 'branches' of research activity. See Appendix 3.3 for further details.

    - Current research themes/priorities:
        - Mental Health, Musculoskeletal Injury, Ready and Able, Endemic, Epidemic & Environmental, Closing the Sophistication Gap, Combat Casualty Care

3. **Front Line Command Capability Needs** - How to support the Front Line Commands. See Appendix 3.4 for further details.

    - Further work is required to fully understand the needs of the Front Line Commands and this is recognised by DMS leadership.

The Function

Scope

H&MOC delivers and coheres Defence medical policy and medical operational capability.

The Function places medical deployability and operational patient care excellence at the heart of what it delivers. By doing so, the function optimises support to UK Armed Forces Healthcare Delivery in the Firm Base and on Operations, Overseas and on Exercise.

Functional Activities

(Appendix 7)

The 10 Functional Activities (9) are defined in JSP950 are shown below. If we understand these activities, we can define what Business Capabilities and Digital Capabilities are required to enable them.

- Functional Activities
- Research and Innovation
- The Military Medical Contribution to Security & Stabilisation
- Medical Logistics
- Force Health Protection
- Pre-Hospital Emergency Care
- Medical Evacuation
- Primary Health Care
    - Primary Medical Care
    - Mental Health
    - Primary Dental Care
    - Occupational Health
    - Rehabilitation
- Deployed Hospital Care
- Medical Command, Control, Communication, Computers and Information
- Firm Base

Functional Strategy & Vision

It is the remit of the Functional Strategy (22) to clearly articulate the need for change and the benefits the change will deliver. This Digital Strategy states how we are going to digitally enable the Functional Strategy. The Functional Vision is also defined in the Functional Strategy and it is as follows:

Vision: Maximised medical deployability and excellence in operational patient care

Goals:

- Maximum medical deployability and employability of the Defence population
- A capable, responsive and efficient suite of medical capabilities able to generate OPCPs; agile enough to support persistent engagement, while configurable and resilient enough to sustain the FIGHT
- An exemplar, data-driven learning organisation with an embedded culture of continuous improvement regarding both excellent patient care and operational outcomes

ENDS

The Strategic Roadmap

This document defines our ‘Digital Direction’ i.e. we recognise we are on a journey; we know where we are today and we need to steer ourselves in the right direction towards the Function’s high-level Vision and Goals. Throughout the journey we will reassess the progress we have made and then define Nudges to ensure we continuously head in the right direction whilst working towards digitally enabling our Functional objectives. The H&MOC Functional Strategy and Transformation programme will define the priority order of the Goals, and the HQ DMS CDIO department shall, along with the Transformation programme, agree the prioritisation of the digital Nudges, Digital Approaches and ultimately the improvement projects and programmes. The further into the Future the Goals are likely to be achievable the less is known about how they can be achieved – this is why the picture below shows little detail on the map because we do not know what the future holds.

We recognise that applying a Nudge requires effort and change. For example, some Nudges require very little effort but result in large changes and sometimes a large change require large amounts of effort. A Nudge should be a SMART (Specific, Measurable, Achievable, Relevant and Timely) action, that will be taken to ‘nudge’ or ‘steer’ the Function towards a Goal through a digital improvement. It could be considered a smaller bite-sized Goal, but it incorporates complexity theory where the consequences of the action are not fully known, but we believe it will deliver business benefit.

Multiple Nudges may be required to ultimately achieve a Goal or Sub-Goal, but each Nudge will require less effort and deliver a small change, than trying to reach a Goal in one go. Taking smaller steps allows the business to quickly bypass unexpected obstacles and take advantage of novel solutions it discovers along the way. Taking smaller steps also helps reduce the impact if Nudges fail, since we can quickly learn lessons, and try something new – we may also want to run several Nudges in parallel where the situation is proving complex.

The Function's Digital Vision

The Digital Vision statement aims to clarify what embracing digital change and digital capabilities will mean to the Function i.e. key benefits we want to see during our digital journey. Not only will we enable the Functional Goals but we will see additional benefits only becoming truly digital can deliver.

"***We will enable the delivery of improved outcomes for our people both at home and overseas. It will underpin the delivery of improved insights to meet the needs of our patients***."

Key Digital Goals:

Improved Outcomes

1. Resilience
   - We can quickly and iteratively adapt and evolve our capabilities (people, processes and tools) based on inputs from the customer and changes in our environment
   - We are open to re-examining your entire way of operating and understanding where the new frontiers of value are – through research and innovation
   - We fully exploit the Digital Backbone and cyber risks are robustly mitigated and managed

2. Customer Focused
   - We are closely attuned to our personnel's decision journeys within our own patient care pathways and where they link to national health services
   - We design and deliver the best possible experience, across all parts of the business including continuous digital training and feedback processes

3. Empowered Users
   - Our culture reflects the understanding of digital benefits and the need for change
   - People can effectively use digital technologies to reinforce their ability to make decisions
     - Those that receive care: Our service personnel (including working animals) and their families and dependants
     - Those who provide care: Our clinicians and medical personnel
   - Those who enable care: Our infrastructure and management personnel

Improved Insights

4. Trusted & Fully Informed
   - We make decisions on mastered, quality controlled and appropriately available secured data and information
   - We have access to knowledge (experience and theoretical understanding) held within people or captured in physical or digital form, irrespective of the situation and geographical location
   - We have confidence that our information is secure and cannot be influenced or interrupted due to cyber or electromagnetic attacks
   - We make the right decisions at the right time through proactive, contextual, real-time, trusted insight

Functional & Pan-Defence Goals

The Goals 1-7 are derived from the Functional Strategy and relevant pan-Defence digital strategies. Those Goals indicated by a decimal place e.g. 1.1 are Sub-Goals created to help create digital Nudges.

1.0	**Tailored Workforce**
1.1	Maximum deployability and enhanced patient outcomes and rewarding and sustainable careers
2.0	**Agile Medical Capability**
2.1	A more coherent cross-DMS approach to managing the whole force will deliver better patient care, improved operational outcomes and a more predictable and sustainable demand signal
2.2	Medical Support to Operate
2.3	Medical operating advantage
2.4	Medical Support to War fight
2.5	Retire sunset capabilities. Invest in modular, scalable and sustainable equipment, as well as modern training facilities and techniques
3.0	**Digitally Enabled and Data Driven**
3.1	Delivery improved Force Generation, Force Healthcare and Operational performance.
3.2	Ability to gather, process, evaluate and transmit data at speed and empower our people to make faster, better decisions
3.3	To protect the supply chain, facilities and personnel from disinformation and cyber tactics
3.4	**See adherence to Defence's digital strategies below**
4.0	**Optimised Medical Firm Base**
4.1	Deliver higher levels of better prepared people and equipment capable of operating effectively within the environments envisaged by the Integrated Review and Defence Strategy 21
4.2	An optimised firm base to allow injured/wounded personnel the best chance of recovery
5.0	**Connected and Resilient Clinical Expertise**
5.1	Build resilient capabilities and expertise to provide continuity of identity and care over time
5.2	Empower deployed medical staff and maximise the commanders FoM
6.0	**Learning Organisation to Our Core**
6.1	Empower continuous innovation and education.
7.0	**Stakeholders Informed, Engaged and Supportive**
7.1	Improved awareness of DMS issues, roles and responsibilities

3.4	**Adherence to the Defence's Strategies**
3.4.1	**Digital Strategy – People**
3.4.1.1	The right tradecraft to deliver and exploit the Digital Backbone and foster a digital mindset
3.4.2	**Digital Strategy – Process**
3.4.2.1	Common standards, governance and processes realising One Backbone for One Defence
3.4.3	**Digital Strategy – Data**
3.4.3.1	A data-enabled organisation that leverages data as a strategic asset.
3.4.4	**Digital Strategy – Technology**
3.4.4.1	DMS Digital Strategy to be updated upon the release of the technology strategy
3.4.5	**Digital Strategy – Secure/ Cyber**
3.4.5.1	We deliver solutions that are secure by design
3.4.5.2	We govern cyber risks and compliance
3.4.5.3	We rapidly detect and respond to cyber issues
3.4.5.4	We have secure foundations
3.4.6	**AI Strategy**
3.4.7	**Information and Knowledge Management** – *(See JSP 441)*

Business Capabilities

Business Capabilities are the articulation of the capacity, materials and expertise an organisation needs in order to perform core functions. The DMS contains multiple value streams and these streams will utilise one or more Business Capability. Defining a Business Capability's Digital Capabilities (people, processes, digital and tangible resources), provides a great insight into what the organisation requires to deliver value. Eventually all our digital improvements will be directly linked to a Business Capability so we:

- Have a common vocabulary and alignment between what the business does and its digital needs
- Can relate projects to each other through mapping back to a common view of capabilities
- Can ensure stakeholders agree on the capabilities to be delivered to the business before proposing potentially incorrect or incomplete solutions

An understanding of the Business Capabilities is critical in defining our digital needs. If we understand what the business needs to do (Business Capabilities) and how it needs to change (Nudges responding to the Drivers) we can define changes to our Digital Capabilities and we can setup improvement projects accordingly. i.e. we have the Golden Thread between the ENDS, to the WAYS to the MEANS. The current draft Business Capabilities for Defence Medical Services state the following for its core capabilities:

Strategic:
- Medical engagement and interoperability
- Medical organisational development
- Medical Policy management

Generate and Enable:
- Medical Command and control
- Medical support management
- Medical logistics management
- Medical communications management
- Medical information management

Operate:
- Force Health protection management
- Operational patient care pathway management
- Military healthcare management

Supporting:
- The list here are common across Defence – these include finance, logistics procurement management etc.

Digital Capability Building Blocks

If Business Capabilities are the means to which a Function delivers value, then it's these capabilities that require the Digital Capabilities to allow the Function to reach its Vision and Goals. Ultimately Digital Capabilities deliver value by people making decisions (or in some instances intelligent automated systems), whilst following processes, that are fed by the right data, information and knowledge at the right time (JSP 441 (6)). The decision-making process is also supported by regulations, legislations and standards to ensure decisions are made in the right and lawful way. This Digital Strategy ensures a 'Golden Thread' between the needs of the organisation and the creation, improvement or removal of its Digital Capabilities. Ultimately this is what our Digital projects and programmes defined in the MEANS represent.

WAYS

“Strategy is the bridge between policy or high-order goals on the one hand (our ENDs) and tactics or concrete actions (our MEANs) on the other…Strategy is a somewhat fascinating mix between two seemingly opposite elements: Value Generation and Management of Uncertainty…” (4)

Introduction

The previous sections of this document have defined the Drivers, the Function and ENDS i.e. where we are now, what is causing us to change and where we want to go.

The WAYS section is the point where we define how we are going to journey towards our Digital Vision.

The method we will follow in steering us along our digital journey (our 8 Steps) will be consistent in how we respond to our Functional Goals and those Goals defined in the relevant pan-Defence strategies – Data, Cyber, Technology, AI, Information and Knowledge Exploitation.

We will assess each of the Goals originating from a Functional or pan-Defence strategy and break them down achievable Nudges. Each of these Nudges will be assessed and high-level digital responses/enablers identified – we have called these our Digital Approaches. The Digital Approaches will lead to digital projects and programmes – this is how we maintain a Golden Thread i.e. an uninterrupted line of sight between a need and a solution. Our Digital Approaches we be assessed at least yearly to reflect any changes to the Goals and Nudges etc.

Steering our Digital Journey

This document defines the digital enablers for our Functional Strategy. It balances what we know today verses the unknowns of tomorrow. Ideally it needs to be agile enough to cope with unexpected situations, yet clear enough to ensure we continuously steer towards our Functional Vision and Goals. Our method in the definition, prioritisation and control over all digital projects and programmes impacting the DMS is to steer all projects and programmes through the following steps:

Everyone must understand the starting point and the destination

Step 1: Understand the Business (Currently unavailable)
If we do not understand the business we cannot act accordingly within it. We must reduce the risk of trying to operate ill-fitting Digital Capabilities within unsuitable situations. Appendix 4.1.

Step 2: Breakdown Goals into Nudges & Digital Approaches
Nudges allow us to be agile and resilient during our journey towards the Vision. They are smaller and more achievable than the Goals. Goals and Nudges are set by the Functional Transformation Director and CDIO. Digital Approaches are how we can help enable the Nudges through digital means. Summary: Appendix 4.2 Details: Appendix 5.

Step 3: Maintain the Golden Thread
Improvement projects must maintain the Golden Thread i.e. the line of sight from the H&MOC Vision and Goals to the individual digital projects and programmes. We must know why we are making a change. Appendix 4.4.

We must make the right decisions within our Digital Projects and Programmes

Step 4: Follow the Guiding Principles
Life is complex and we cannot predict the future with certainty. Principles will help us navigate during complex events during our journey ensuring we constantly steer in the right direction. Appendix 4.5.

Step 5: Apply Appropriate Governance
The HQ DMS CDIO will retain accountability and authority over all DMS Digital projects and programmes, in line with wider DMS Transformation governance. Gaining approval for a project, what support is available, providing feedback is all coordinated by the CDIO governance model. Appendix 4.6.

Step 6: Apply Enterprise Architecture
The DMS shall ensure all projects and programmes are cohered under a common Enterprise Architecture that aligns Functional Processes with all Digital Enablers. Appendix 4.7.

Step7: View the need holistically
We must ensure all projects define the implications on People, Process, Tools; as well as data, information and knowledge. Appendix 4.8.

Step 8: Define the MEANS: Improvement Projects & Create Critical Theme(s)
Critical Themes represent common Digital Approaches that will deliver the Nudges. All projects and programmes should be aligned to a Critical Theme (if required) and Functional prioritisation. Appendix 4.3.

Explaining the Key Steps

The following summarises a few key steps, relevant to all those within the Function. For those who wish to know more, the details can be found in the annex.

The Golden Thread

Being able to trace why we need to change to how we are going to change.

It's the approach that captures the pedigree i.e. lineage between the organisational needs and Drivers all the way to the digital improvement projects and programmes delivering solutions to meet those needs or tackle the Drivers. See Appendix 4.4 for further details on the Golden Thread.

The Golden Thread:

- Indicates the importance of maintaining the link between the Functional Strategy, Functional Transformation programme and Digital enablers to ensure the organisation has everything it needs to change.
- Provides an easy-to-follow route to help identify the benefits a Digital Capability will provide, who it will impact and how the change will enable a Functional Goal.
- Ensures we understand how the organisation operates and how it delivers value (the Business Capabilities) and what Digital Capabilities (Data, Information and Knowledge – people, process and tools) those Business Capabilities require.
- Provides a method of tracing a need (or requirement) through the Enterprise Architecture i.e. from Business need, into the systems, technology and data layers.
- Prevents duplication of effort because we can see what projects and programmes are underway and what Digital Approach they are supporting.
- Identifies Digital Approaches that have no associated projects or programmes and where we need to budget and plan for future work.

Guiding Principles

Our foundational beliefs and behaviours we expect all to follow.

Principles are general rules and guidelines that are intended to be enduring, that help us navigate complex events on our journey towards our vision. See Appendix 4.5 for further details on those Principles that may require further explanation.

Principle 1: When dealing with high uncertainty build strategic resilience and when dealing with low uncertainty build robustness

High uncertainty where we can't guarantee future needs or events, we must provide continuity of value and patient care over time whilst accommodating unexpected situations and unclear future needs. Our Digital Capabilities must be resilient and accommodate change – think agile, modular, scalable.

Low uncertainty where hindsight can lead to foresight, we should maximise effectiveness and efficiency of business processes through robust Digital Capabilities – think waterfall, automation.

Principle 2: We must be ready before we seek to exploit AI capabilities

For the DMS to become 'AI' ready there are a number of critical enablers that must first be designed, developed and implemented before we can truly benefit from AI technologies. We must first understand our data, ensure the correct governance is in place and provide the technical capability to be able to fully exploit our data. We must also build and develop our skills and understand the technology that we have and are bringing in as part of our major programmes (CORTISONE and HIP). Lastly, we must understand what 'new' data we will be generating and review our existing processes, looking for opportunities to automate and streamline wherever we can. Once we have done this then we will be ready to exploit AI capabilities.

Principle 3: Digital Capability only delivers value if used and used correctly

The organisation shall resource, fund and train the end users of any Digital Capabilities developed by the HQ DMS CDIO department - The Digital Strategy provides the digital enablers and it does not fully cover the totality of business change required to embed those digital capabilities. We must seek and work with end users and the wider Transformation programme to ensure Digital Capabilities are used correctly and embedded into day to day operations.

We also recognise that training and end user feedback is absolutely critical to the success of any digital capability. Therefore we will continuously capture end user feedback and we will implement multiple training opportunities upon new capability deployments and ensure there are methods to provide continuous training i.e. we will not implement a 'fire and forget' training strategy.

Lastly, we know we have to provide the basic infrastructure to ensure new digital capabilities can be used. Therefore site readiness is vital for example providing WIFI connectivity and basic laptop/PC devices.

Principle 4: We have a part to play in cyber security but we must be secure by design

Whilst HQ DMS CDIO will play a part in cyber security and assuring live digital capabilities, those who develop the digital capabilities must ensure they are secure by design. Therefore DMS has a reliance on Defence Digital and other Digital Capability Providers in providing safe and secure solutions for national and international use.

Principle 5: All IT systems are clinically safe by design

All health digital services (both hardware and software) must be proven clinically safe and approved by those recognised to hold authority over clinical safety.

Digital Governance

How our digital journey will be governed.

The HQ DMS CDIO will retain accountability and authority over all DMS Digital projects and programmes. The CDIO will also manage all digital risks within the H&MOC Function. See Appendix 4.6 for further details on the Digital Governance.

The HQ DMS CDIO governance model interlinks with the wider Defence digital governance model.

Key points:

- All DMS digital demands shall flow into the CDIO department through the CDIO Front Door. These demands will then be triaged to determine prioritisation and next steps – including delivery route.
- All digital projects will be monitored and tracked with appropriate metrics, KPIs etc. in place.
- All new demands (request for support, services or digital capabilities) into Defence Digital (or other digital capability providers e.g. JHubMed) shall be cohered through the HQ DMS CDIO portfolio process. Once cohered, all demands shall feed into the Defence Digital portfolio. Note: Defence Digital's Digital Business Partner can support demand requests and provide internal sponsorship within Defence Digital.
- The primary interface with the pan-Defence strategic and leadership boards is via the HQ DMS CDIO. The Digital Business Partner can also provide support as and when required.
- Business Digital Risks: Managed by CDIO and escalated to DMS 3* risk process if required.
- Cortisone risks goes through Transformation 2* risk process
- Defence Digital's Customer Managers remain key touchpoints for pan-Defence live services and catalogue requests.
- The governance model will continue to build strong ties with national health care providers and NATO partners to discuss digital/medical best practices.

MEANS

Introduction to Tactics

Tactics are: “An action carefully planned to achieve a specific end”

Our Tactics are delivered through the following:

- The projects and programmes that have been launched (or planned) to deliver one or more Digital Capabilities into one or more Business Capabilities, in response to the Digital Approaches. If there is a common theme running through multiple Digital Approaches then they are grouped together under a ‘Critical Theme’. It is worth restating that change cannot occur without combined effort between the business teams (e.g. end users), the H&MOC Transformation programme and those providing the updated or new Digital Capabilities.
- The capabilities of the DMS CDIO department i.e. the services it offers to the wider DMS community to enable all our digital needs – or act as a conduit to those who can.
- The Digital Capability Providers. Those in Defence who will design, build and deliver the digital services and solutions we need.

Critical Themes & The Digital Projects & Programmes

Critical Themes

What we should focus on now.

Critical Themes represent a collection of Digital Approaches that are tackling the same Goal/Nudge through a common suite of Digital Capabilities. Critical Themes will be updated as and when required to reflect the Digital Approaches and Functional Nudges. They should be considered the priority for the Function. See Appendix 4.3 for further details on the Critical Themes

The focus for the current year.

- A continued focus on stabilisation of the DMS key clinical legacy system while moving CORTISONE forward to replace aspects of this system in year.
- The procurement process around a new Dental module and the migration of consultations and archive records from the legacy system to the CORTISONE Archive and Clinical Repository will be a major step forward.
- Our work to bring together numerous medical digital work strands across defence to cohere and standardise delivery of a developing eco system that CORTISONE is enabling, will be driven through the DMS Digital board.
- A new operating model for DMS Digital is being finalised to meet the demand of the strategy and delivery underway.
- A new data platform is live and will begin to provide insights to force readiness, faster clinical reporting and meet the needs of opportunities that will arise through the various physiological data projects that are underway in year.
- To support the direction of CORTISONE and underpin DMS digital transformation a new DMS future capability team is in place to advise and influence our requirements around digital hardware, power, and network needs for medical deployments.

- We will be finalising a trial on patient self-care systems to feed into our electronic Heath Record. Digital rostering will allow us to be more effective in the management of our clinical staff to meet the needs of our patient population.

- This will be integrated to the data platform will give far greater insight in how we plan and improve our services.
- This will be a year of major change across CORTISONE and digital delivery within the DMS, with greater reliance on improved governance to drive more effective and efficient delivery

Theme1: Digitally Enabled Capture & Transfer of Medical Insight

A key enabler for any Function wishing to develop its knowledge management i.e. the capture and sharing of what people know. We must break down internal and geographical knowledge silos to build organisational resilience and our ability to act upon the right insight at the right time. Plus, we must ensure we don't forget what we already know over time. This becomes more important as service personnel are deployed for longer periods of time and the need to reach back to the firmbase for medical insight grows.

Theme 2: Enhanced Insight through Information Exploitation

This theme represents a wide range of analytical digital capabilities that will provide DMS with a greater level of insight that would not have been possible through manual only approaches. The digital capabilities will gather, interrogate and where possible exploit novel cognitive capabilities like A.I., Machine Learning etc. to support the decision making process.

Theme 3: Digital Career Management and Workforce Planning

A collection of digital approaches that support the management of employee careers and improved demand management i.e. the ability of Defence Medical Services to meet the demand signal and the resource requirements (skills, knowledge etc.) set by the Front Line Commands.

Theme 4: Simplified, Secure & Modern Infrastructure and Ecosystem

A holistic theme that provides the core digital infrastructure within Defence Medical Services to meet its current and future digital needs. Predominantly delivered by the Cortisone Programme, this theme represents several key digital capabilities that come together to form the foundational and evergreen ecosystem; on which all current and future digital capabilities will need to integrate with.

Theme 5: Process Digitisation

A collection of Digital Approaches that sit outside of Theme 4 and the core infrastructure and ecosystem. They provide a level of process digitisation i.e. any digital tools that allow the end user to follow a process more efficiently and effectively through automation techniques (PowerApps, Robotic Process Automation) that sit alongside the core ecosystem. They do not hold master data, but they are able to interface with master systems and typically support direct user interaction with the data.

Theme 6: Patient Self Help (Empowerment) through Digitisation

Also known as Patient Facing Services. Any Digital Capability that connects the end user with core data, whether it be their own personal data generated by wearable measurement devices, or information available (in an end users' friendly format) on core master systems. All with the intent to support the end user – the patient – in supporting themselves rather than seek formal clinical aid.

Theme 7: Digital Transformation – Governance, Strategy, Training/Upskilling & Change

A foundational theme that contains 4 key elements: 1) ongoing governance over the Digital Strategy and digital projects by the CDIO department and wider H&MOC Transformation programme – currently including HIP (Healthcare Improvement Plans), 2) development of all digital training needs by both end users and clinical staff, and 3) the support required to enable the H&MOC Transformation programme and any digitally aligned cultural change initiatives and 4) the ability to engage with end users through continuous feedback routes.

Theme 8: Deployed Power Generation and Storage

A key need in the deployed environment is to generate and store power to operate medical digital capabilities where local power supplies are not available or secure.

Theme 9: Deployed Local Networking and Connectivity to Core

A key need in the deployed environment is to provide the IT connectivity linking multiple digital capabilities together to form a local network and the ability to link this network to core Deference systems located in the Firmbase.

Theme 10: National and International Logistics and Resupply

The provision of medical supplies in the Firmbase and Deployed environment is critical to operational success. Medical assets can be blood supplies, bandages etc. any physical item that must be transported to the point of need.

Theme 11: Deployed Hardware

Unlike in the Firmbase, medical equipment that is suitable for the deployed environment must offer a greater level of robustness, security and transportability. Plus, with a growing need for deployed clinical staff to make quicker point of injury decisions, more often; there is a need for more dedicated hardware to help them make insightful decisions.

Key Programme Summary: The Next 12 Months

There are several key initiatives underway that indicate the priority of the HQ DMS CDIO department:

	Golden Thread
CDIO Capability	
• Grow CDIO department through several new DDaT SME positions • Go live with new CDIO structures: Digital and Data projects, dedicated live service and applications management, innovative digital solutions and a compliance and audit capability • Establish: CIDO Front Door for all Digital and Data requirements, CDIO Digital board and working groups and Digital Project Boards	***H&MOC Goal 3**:* *Digitally Enabled and Data Driven* ***Critical Theme**:* *Digital Transformation – Governance, Strategy, Training/Upskilling & Change*
Information Exploitation & Data Maturity	
• Deliver the first phase of DMS Information Exploitation - DMS workforce data with a second phase including additional requirements on clinical competencies • Automated Data Quality checks and baselining of Data Holdings	***H&MOC Goal 3**:* *Digitally Enabled and Data Driven* ***Critical Theme:*** *Enhanced Insight through Knowledge and Information Exploitation*
• Project Apollo Phase 2 an interim performance reporting system that has confirmed future interoperability with DMS-IX and the wider DMS digital ecosystem. Phase 2 delivers additional clinical, governance, and assurance metrics as identified in the Defence Healthcare Information Requirements.	***H&MOC Goal 1:*** *Tailored Workforce* ***Critical Theme:*** *Digital Career Management and Workforce Planning*
Improved technical and digital capability at Medical Facilities	
• Delivery and installation of equipment and peripherals • Upgrade to Windows 10 across the DMS estate to enable Cortisone and HIP Digital products. • Several Apps and quick wins to automate processes to enable more efficient ways of working e.g. Equipment Care 373, e-Registration, SMS text messaging service, MS Shifts Trail • Improved Information Architecture across the Medical facilities to support the HIP programme of Combining Practises.	***H&MOC Goal 4:*** *Optimised Medical Firm Base* ***Critical Theme:*** *Simplified, Secure & Modern Infrastructure and Ecosystem*
Deployed Environment	
• Established an enduring service to meet the capability requirements established by Project LARA	**H&MOC Goal 4:** Connected and Resilient Clinical Expertise **Critical Theme:** Digitally Enabled Capture & Transfer of Medical Insight
Cortisone	
The current phase of CORTISONE has prioritised: defining the run & maintain process, further improvements to HECMS and DMS-IX, further analysis into Dental and Deployed requirements and the creation of a representative Deployed digital environment, the promotion of the Portal to 'full live use', engagement with industry on the laboratory information system (LIMS), and several improvements to Primary Medical Care and general improvements to the DMS capabilities through the Digital Enablers programme.	**DMS Multiple Goals** **Critical Theme:** Simplified, Secure & Modern Infrastructure and Ecosystem

What the HQ DMS CDIO Department Offers

The HQ DMS CDIO department has a range of capabilities in place to meet the needs of the H&MOC Function. These capabilities can be called upon to govern, develop, deploy and maintain digital solutions. The high-level groupings of the capabilities are listed below.

- Digital Solutions
  - Providing efficient and effective in-house digital solutions
  - Rigorously managing all solutions through-life
- Data Management
  - Applying techniques to underpin the quality and accuracy of our data
  - Ensuring that all datasets are maintained in an operational state
- Asset Management
  - Procurement, provision, maintenance and control digital equipment
  - Providing an accurate picture of the digital inventory
- Digital Innovation
  - A digital testing and development capability that monitors the market for emerging initiatives and assesses suitability
- Information Management
  - Provision of structured, secure and legally compliant information repositories
- Information Assurance
  - Interpretation, implementation, advice, auditing and assistance of national and departmental information assurance policy
- Records Management
  - Interpretation and implementation of departmental records policy
- Knowledge Management
  - Harvesting of tacit and explicit knowledge from all areas of the organisation and making available in context for those who need it.
- Data Analysis
  - Drawing business intelligence from combined organisational data
- User Support
  - First line support to customers in the use of mainstream MODNet digital tools and applications.
  - Account provision and maintenance of core business applications, with advice and assistance in their general use
- CDIO Communications
  - Advise and inform the user community of CDIO services offered
- Information Services
  - Design and delivery of end-to-end digital services
  - Ensuring coherence with overarching strategies
- Cyber Security
  - Provision of security design advice at all stages of digital development. Proactive and reactive management of potential and actual cyber security incidents on behalf of the organisation. Professional advice on cyber security matters.
- Digital Programme Management
  - Professional management of the CDIO digital portfolio, including sub-programme and project management, and ensuring strategic coherence across the full range of digital initiatives

Digital Capability Providers

The HQ DMS CDIO will utilise the range of Digital Capability providers within Defence according to their skillset and ability to deliver the maturity of the Digital Capability required. Digital capability maturity can be expressed as a 'readiness levels' and this is a good way of indicating the different scopes of the Digital Capability Providers.

- HQ DMS CDIO: Core Department
    - The core DMS CDIO department offers a range of capabilities to develop and deploy digital solutions using core network solutions e.g. Office 365 tools.
- HQ DMS CDIO: Live Services
    - Dedicated resource within the DMS CDIO department to support live Digital Capabilities or to aid pilot/trial solutions in relevant environment
- Defence Digital
    - Responsible for all aspects of Defence information capability, including policy, design, acquisition, operation and support. It is the MOD's key enabling organisation for the delivery of Digital services and capabilities
- jHubMed
    - For novel medical applications of commercially available technology that require exploration and testing before being deemed suitable for Defence. Will typically transfer tested capabilities into Defence Digital to embed into core networks and to provide robust service wrapper
- Front Line Commands
    - The Front Line Commands have their own digital departments led by their own CIOs. These department can develop Digital Capabilities under the federated portfolio agreements with Defence Digital

DMS Transformation: Digital Roadmap

The following Digital Roadmap is a snapshot of the agreed H&MOC Goal 3 and 5 milestones. This roadmap will be further refined to expand into the remaining H&MOC Goals and Critical Themes early 2023. The aim is that all major Digital Approaches will be represented on the Roadmap.
Note: The Roadmap may change depending upon changes in the Drivers or Functional Goals. This is inline with the strategic intent to become more resilient to change and to reflect where we are on the journey towards the Vision.

The Roadmap shows:

1. DMS Goal: Connected and Resilient Clinical Expertise
    a. Critical Theme: Digital Transformation – Governance, Strategy, Training & Change
        i. Project: Deployed Strategy published mid 2023
    b. Digitally Enabled Capture and Transfer of Medical Insight
        i. Project: LARA FOC Mid 2023
        ii. Project: CDIO Trials and Innovation Unit go live mid 2024
    c. Simplified, Secure & Modern Infrastructure and Ecosystem
        i. Project: CORTISONE Deployed mid 2025

2. DMS Goal: Digitally Enabled and Data Driven
    a. Critical Theme: Digital Transformation – Governance, Strategy, Training & Change
        i. Project: CORTISONE SRO aligned to CDIO early 2022
        ii. Project: Digital Enablement document published end 2022
        iii. Project: DMS Site Readiness due early 2023
        iv. Project: Cyber Team & Secure by Design Structure FOC due end 2023
        v. Project: DMS People Upskilled early 2024
        vi. Project: CDIO Workforce Plan Delivered mid 2024
        vii. Project: FOC CDIO Operating Model mid 2025
    b. Simplified, Secure & Modern Infrastructure and Ecosystem
        i. Project: DMICP stabilisation due end 2022
        ii. Project: CORTISONE & HIP (Value Added Services) due mid 2025
    c. Enhanced Insight Through Knowledge and Information Exploitation
        i. Project: Data Platform due end 2022
        ii. Project: Data Strategy due mid 2023
        iii. Project: DMS Information Architecture FOC mid 2024
    d. Patient Self Help (Empowerment) Through Digitisation

Appendix

Appendix 1 Glossary

Term/Acronym	Description/Meaning
H&MOC	Healthcare & Medical Operational Capability (A Defence Function)
HSS	Health Services Support. includes all services performed, provided or arranged to promote, improve, conserve or restore the mental or physical well-being of personnel – NATO AAP-06
RCDM	Royal Centre for Defence Medicine
DMRC	Defence Medical Rehabilitation Centre
DPHC	Defence Primary Healthcare
DMS	Defence Medical Services
S.M.A.R.T	Smart Measurable Actionable Realistic Timebound
RACI	Responsible Accountable Consulted Informed
CDIO	Chief Digital Information Officer
TLB	Top Level Budget Holder
HLB	High Level Budget holder
Knowledge	The coupling of theoretical understanding and lived experiences
POI	Point of Injury or Illness.
DLoD	Defence Lines of Development
DDaT	Digital, Data and Technology
OPCP	Operational Patient Care Pathway
MEDEVAC	Medical evacuation, often shortened to medevac or medivac; the evacuation of military or other casualties to hospital in a helicopter or aeroplane

Note: Only include this Appendix if numerous acronyms are used in the main body of the document. If only a few acronyms are used qualify each as they are first used in the main body of the document.

Appendix 2 Digital Strategy Scope

Appendix 2.1 Data, Information & Knowledge Definitions

People make decisions on both knowledge and information. People also learn when they make a decision – this happens when we succeed or fail.

Defence is currently undergoing a review on the definitions on the above. This document will refer to these definitions once published. Until then the definitions will be taken from the Oxford English Dictionary.

Appendix 3 Drivers

Appendix 3.1 External Drivers

The drivers in more details.

Political	**How government controls and influences the economy or organisation**
	• Continuous & longer periods of military operating action is expected
	• Interface with NATO/ad hoc partners/host facilities is becoming vital
	• Interface with the NHS trusts in England, Scotland, Wales and Ireland is essential to cope with patient movements
	• Continuing support to NHS Digital and the NHS's vision and goals
	• All governmental departments expected to support the UK economy
	• Continuous military rotation of clinical staff continues to inhibit continuity
	• Increase in concurrency/multiplicity of action
	• Areas of strategic interest and lines of communication must be considered prioritized targets; supply chains and evacuation routes will likely be compromised and medical treatment facilities temporarily isolated
	• The government's 2022-25 Roadmap for Digital and Data states six cross-government mission statements (11)
	• The world is increasingly complex and organisations must become resilient (5)
	What this means for the Function
	• Continued headcount restrictions will increase focus on removal of low value-added tasks, more efficient and effective working through digital capabilities
	• Support military continuity through training and digital tools supporting knowledge loss prevention i.e. knowledge capture, sharing and retrieval
	• Support the coherence and rationalisation of the firmbase sites/digital infrastructure to accommodate less headcount, increased deployed duration and an environment that is increasingly complex
	• With longer deployed durations, expect new types of injury and increased mental health issues, plus demand to increase for remote capabilities and knowledge transfer from firm base
	• Require efficient logistics, better resource management, delegated responsibilities to enable remote operations
	• Support to the NHS and NATO partners is required through the sharing of innovative technologies and best practises
	• Continuous improvement and innovation must remain a focus to handle new injury types and the support and treatment of mental health issues
	• Security of physical and digital supply chains must remain a focus and systems must operate in isolation if connection to the firmbase is interrupted
	• The government's 2022-25 Roadmap Mission Five: Digital Skills at Scale can be used to add targets to the existing Defence's Digital strategy on up skilling people and having the right DDaT resource in place
	• Continue to support the NHS through:
	  ○ the establishment of Defence's own in-house informatics capability through access to SME, advice provision, and knowledge exchange
	  ○ Explore DMS assets and capabilities which could be positioned as incubator for wider UK healthcare innovation

	○ Encourage alignment with NHS structures, standards and best practice, towards enabling healthcare delivery and access on a par with local provision ○ Encourage significant bilateral engagement to enable the above aims and build on existing relationships
Economic	**How prices of products and services influence supply and demand** • Funding will continue to be an issue and level of spend scrutiny will remain • Reductions in defence budgets have led to over-reliance on commercially available solutions **What this means for the Function** • Reduce reliance on expensive locums to fill staffing gaps • Increased efforts to ensure solutions meet unique needs of DMS • Prioritisation of objectives to maximise benefits
Social	**How demographics and culture impact the environment** • Defence's intent to improve flow of personnel between all the services • Competition for resource is increasing due to global shortage of medical staff • Public discontent between political and social groups is further eroding trust in governments and traditional institutions • Mass migrations are increasing due to climate change and conflicts (24) • Increased need to promote health readiness and health promotion **What this means for the Function** • Improve efficiency of existing staff e.g. reduce clinicians time on admin tasks • Build synergies and reduce cultural differences between the single Services • Attract and retain staff through communications campaigns, training, career management and continuing professional development • Deploy solutions to improve efficient and effective use of limited resource • Improve ability to recruit and alternate ways to fill resource gaps • Build Functional authority and coherence pan-Defence and deploy common solutions caveat that environmental specialism will be required • Support is likely to increase to tackle injuries associated with large population migrations as well as supporting medical personnel in traumatic situations • Competition for resource increasing due to global shortage of SQEP resource including Digital, Data, Information & Cyber • The need to capture corporate memory from those leaving the organisation
Technology	**How innovation and technology changes impact ways of working** • Rapid technological change • Pervasiveness of information and the need to share live data globally • Use of human enhancement and a rising importance of the human machine interface • A greater number of sensors and the proliferation of the Internet of Things

	• Artificial intelligence, autonomous systems and human enhancement, are not yet widely accepted and will expose divergent ethical and legal interpretations
	• Cyber attacks including electronic jamming becoming frequent threats
	• As per Defence's Digital Strategy, the digital issues facing DMS are consistent with those across Defence (3):
	  o The technology core is too fragmented, fragile, insecure and obsolescent,
	  o Data is fixed in internal silos, and difficult to access and integrate
	  o We have critical digital and data skills gaps across the enterprise
	  o We remain mired in Industrial-Age processes and culture

	What this means for the Function

	• Solutions to accommodate interconnectivity limits with forward locations and ships
	• Systems to operate at Secret vs. official sensitive coupled with increased cyber protection requirements
	• Need to increase efforts to handle rapid changes in partners technology
	• Need to tackle real risk of information overload and use of trusted data
	• Accommodate knowledge and data transfer restrictions, new eco system requirements and working offline
	• Handle complexity, information sharing, lessons sharing globally in real time
	• To debate and determine the ethical use and limitations of A.I. technologies
	• Continued compliance with UK GDPR whilst maximising technological advances
	• As per Defence's Digital Strategy the function will accelerate digital exploitation and build a modern Digital Backbone to support it:
	  o Data exploited as an asset, at scale and speed
	  o We have the right digital talent
	  o We deploy cyber defences and follow a secure by design approach
	  o We build and deliver a modern technology platform
	  o We make a step-change in Digital delivery quality

Legal	**How legal and regulatory environment affect the policies and control employment, safety, and regulation**
	• Freedom of information, Data Protection and medical regulations • No data or information are to be used to take any advantage of medical vulnerabilities of any party as this would be a serious violation of fundamental ethical and legal conventions and likely have deleterious effects (24)
	What this means for the Function
	• Utilise interoperable, standardised, machine-ready exploitable data and data platforms, plus adherence to the 6 data rules and pan-Defence data governance. Achieved through the adoption of robust Information Management Policies and Processes • Potential issues with integrating healthcare systems with partner nations • Allow data sharing but handle complex redaction, retention and legal hold situations across all medical data

Environmental	**How the physical environment and general environmental protection requirements impact the organisation**
	• Contested cyber and EM and space • Climate change may lead to increasing incidences of natural disasters • Global dispersal • Smaller force elements • Complex, uncertain, unsafe environments • Hostile Climate • Urbanisation • Diseases and non-battle injuries (DNBIs) will be an ever-present risk to personnel that very often generate the greatest burden of morbidity • Novel (or at least, uncommon) diseases and novel weapons appearing in the future. Directed energy weapons will become more common in various forms, as may enhanced blast weapons, which present different medical challenges from what we have largely seen in the past
	What this means for the Function
	• Increased need to work remotely and use global communication solutions • Increased likelihood to support even more challenging, non-war related events and treat a higher mix of injuries • Concurrency of activity impacting on Clinical availability – increased reliance on reserve for more routine activity • Need for staff to have a wider set of skills, increased use of tooling to fill skill gaps; lighter/smaller, more robust equipment • Reduced hold capacity leading to increased reliance on evacuation • New training requirements to deal with complexity, more remotely operated capability and more robust equipment • Environmental experience and expertise become more important (i.e. Land, Maritime, Air) • Possible changes to injury types due to larger injured population during conflict in urban areas leading to Med facilities deploying further forward to meet clinical timelines • Requirement for deployed bedding down facilities/ med specialities • Continued research and ability to react quickly to novel diseases and the use of novel weaponry.

Appendix 3.2 Internal Drivers – Defence Digital Strategies

The current and future needs from Defence's internal organisation including front line commands

Defence Digital Strategies	Summary

	Digital Strategy for Defence: (3) 2025 and 2030 objectives structured around:
	• **People** – Foster an environment where people can find new ways to exploit the technology across the operational and business domains
	• **Process** – Drive the right processes that enable and utilise the Digital Backbone
	• **Data** – Utilise interoperable, standardised, machine-ready exploitable data and data platforms, plus adherence to the 6 data rules and pan-Defence data governance
	• **Technology** – Migrate users on to a modern, secure technology foundation which enables Defence to better exploit the value of emerging technologies
	
	Cyber Resilience Strategy for Defence: (25) 2026 and 2030 objectives structured around being significantly hardened to cyber-attack by 2026, and being resilient to known vulnerabilities and attack methods no later than 2030:
	• **Secure by Design** – using inherently secure digital capabilities
	• **Governance, Risk and Compliance** – Ensuring risk management and involvement in wider Defence cyber governance
	• **Rapidly Detect and Respond** – Provide ability to detect and respond to cyber attacks
	• **People and Culture** – Ensuring people are cyber aware
	• **Secure Foundations** – Adopting standard technologies and replacing obsolete technologies
	• **Experimentation, Research and Innovation** – Support opportunities to stay ahead of cyber threats
	
	Defence Artificial Intelligence Strategy (26) Artificial Intelligence (AI) as a family of general-purpose technologies, any of which may enable machines to perform tasks normally requiring human or biological intelligence, especially when the machines learn from data how to do those tasks
	• All Functions to assess their AI readiness:
	  ○ Have you assessed how AI will shape the future of your business or function? Have you identified those areas where AI is the right solution?
	  ○ Do you have the right culture, leadership models, policies and skills to act rapidly on AI-driven outputs?
	  ○ Do you have accessible, structured, exploitable data? Are you continually collecting data?
	  ○ Do you have access to appropriate scalable computing power (with cloud and 'edge' computing as required)?
	  ○ Do you have models? Are they fit for purpose and can you build, test, deploy and update them quickly enough?
	• All Functions to train their population on the implications of AI
	• All Functions to ensure their Functional Digital Strategies incorporate the AI strategy by December 2022

Appendix 3.3 Internal Drivers – Research Drivers

"Continuous innovation is essential to prevent the cyclical stagnation and regression of military medicine between conflicts, which has repeatedly demonstrated through history an intellectual deficit to be repaid in the lives of Service Personnel at the start of every major campaign" DMS Medical Director, 2014.

Linked to the DMS 'Research Tree'. Six themes have been identified as the principal 'branches' of research activity (10). Note: Those that are most reliant on digital capabilities are highlighted. These are:

Research & Innovation Drivers	**Mental Health priority topics**
	• Novel intervention • Mental health promotion strategies • Recovery pathways and reintegration
	Musculoskeletal Injury
	• Injury prevention and 'prehabilitation' • Lower limb injury • Shortened time to return to service • Self-guided tech-enabled rehabilitation • Physical-mental comorbidity
	Ready and Able
	• Deployment suitability • Lifestyle intervention • Use of simulation for medical training
	Endemic, Epidemic & Environmental
	• Diagnosis and treatment of infectious disease • Individual susceptibility to environmental threats • Treatment of heat illness and NFCI • Reversal of hearing loss and injury due to whole body vibration
	Closing the Sophistication Gap
	• Telemedicine reach back and reach forward • Rapid & rugged diagnostics • Wearable tech / remote monitoring • Blood, oxygen, imaging and pharmacy far forward
	Combat Casualty Care
	• Prolonged field care • Assessment and treatment of traumatic brain injury (TBI) • Blast injury • Effective pain relief

Key digital enablers: Digital infrastructure ambitions

- Develop and implement a searchable medical research registry and collaborative research forum
- Ensure CORTISONE facilitates the use of routine data for research

Appendix 3.4 Internal Drivers – Front Line Command Capability Needs

Front Line Command Capability Needs	Alignment to the needs of the Front Line Commands (FLCs) will be done through multiple channels. **Internal Strategic Channels** An understanding of the FLC strategies is gained through the pan-Defence reports such as the Integrated Operating Concept and Joint Concept Note. Plus, there are teams within the DMS, such as the **MedOpCap** team who form close relationships (such as the **Capability and Force Development** working group (a SO1 level group) and the **Force Development Group** (which is the OF5 level)) with the FLCs and are there is understand the medical capability strategies. Lastly, StratCom runs **Capability Audits** with the FLCs where forward facing scenarios are created to help identify gaps in Functional capabilities and their ability to support FLC future needs. **External Strategic Military & Medical Channels** A key resource is the **HIST** (Health Information Systems and Technology) Working Group (27). They are a multinational military organization working for and accredited by NATO. They assist the Alliance in its goal of continuous transformation in the medical field. Another source is **COMEDS** (28). COMEDS is the senior military medical body in NATO on military medical matters. Along with Medical Advisors in the NATO Command Structure it is the central point for providing medical advice to the Military Committee and for the development and coordination of military medical matters. Lastly, there is NATO's **Allied Command Transformation's** organisation (29). Their mission is to contribute to preserving the peace, security and territorial integrity of Alliance member states by leading the warfare development of military structures, forces, capabilities and doctrines. They have been working on "The NATO Future Medical Support Concept" (24). **NHS Channels** Alignment and engagement with the UK's National Health Service (NHS), whilst not a military organisation is captured here due to the need to flow FLC personnel into and out of the NHS. We have built multiple channels into the NHS primarily through direct representation of **NHS Digital** through an Armed Forces Healthcare & Standards programme manager. **Digital Channels** All the Defence CIOs meet on a regular basis during the FCB (**Functional Coherence Board**). This provides an opportunity to discuss issues and needs as well as to receive a steer from the Defence CIO. The DMS CDIO is in regular attendance at this Board.

Appendix 4 The 8 Steps

Appendix 4.1 Understanding the Business Context

By understanding the business context we can act accordingly within it. We can reduce the risk of trying to operate ill-fitting Digital Capabilities within unsuitable situations.

The Cynefin Framework helps us define the Business Context.

There are four domains: **Clear, Complicated**, **Complex** and **Chaotic**.

Through context analysis within each of our Business Capabilities we can determine which of the domains they reside. We can then tailor our Digital Capabilities accordingly. It's worth noting that capabilities may touch multiple domains depending upon their size.

Clear Domain	The environment is well known and we can build Digital Capabilities on robust and stable processes. A command-and-control style works best; directives are straightforward, decisions can be easily delegated, and processes can be automated.
Complicated Domain	We focus on connecting experts so they can share and exploit their knowledge with others. Processes are less robust and rely more on hard-and-fast rules. We start to see the use of Artificial Intelligence to help decision makers gain insight from large amounts of data.
Complex Domain	We no longer rely on past events to predict the future, therefore solutions that worked previously may not produce the same results. We follow guidelines and move away from imposing order through rigid processes. We need to launch parallel safe to fail experiments using contradicting basic assumptions and respond accordingly. We should employ Artificial Intelligence to spot trends and provide insight.
Chaotic Domain	We need to make fast decisions and then deal with the consequences. Solutions in this space are tailored to making quick decisions from the top-down (we don't seek consensus) based on incomplete information. The objective is to move to one of the other domains as soon as possible.

Coming soon: Work to analyse the Business Context will be conducted between 2023/25 once the Business Capabilities have been defined. Until such a date whereby the Business Capabilities have been defined, all Digital projects and programmes must conduct their own Business Context analysis on the business areas they are impacting to ensure appropriate digital solutions are being provided.

The Cynefin Framework

“knowledge of Cynefin should be required by leaders and decision makers in all organisations. I was trained as an engineer and led to believe there is only one way to approach a project; analyse and plan, resource cost, implement, and finally operate and maintain. Good for building bridges as well as IT systems. But then why do large multi-stakeholder IT projects and attempts to transfer best practice from one organisation to another often appear as wicked problems? Cynefin provides the answer – context determines the approach and choosing the wrong option often leads to unintended consequences…insights into the complex domain are especially relevant as more and more of the challenges we face in a hyper-connected world will fall into the category”. [Les Hales: Chair, innovation and technology committee, British chamber of commerce Hong Kong (2)]

Using the Cynefin framework (1) we can help decision makers sense which context they are in so that they can not only make better decisions but also avoid the problems that arise when inappropriate management approaches cause them to make mistakes.

There are three high level domains: Ordered (Clear and Complicated), Complex and Chaotic. Order is constrained and future outcomes are predictable as long as the constraints can be sustained. The complex domain has enabling constraints and many levels of entanglement, with no linear material causality. Chaos is the absence of effective constraints.

How we act within a Domain:

1. **Clear:** *Sense → Categories → Respond*

Small domain due to environment well known. User can follow processes. Beware of compliancy and falling into chaos. Use of best practices.

2. **Complicated: S***ense → Analyse → Respond*

Peer based validation. Interdisciplinary teams. Use of good practices. Planning is still possible

3. **Complex:** *Probe → Sense → Respond*

Multiple approaches possible. Fast feedback loops. Parallel safe to fail experiments using contradicting basic assumptions.

4. **Chaotic:** *Act → Sense → Respond*

Innovative space. Survival

Managing Constraints:

1. Clear: Fixed Constraints

Simple contexts, properly assessed, require straightforward management and monitoring. A command-and-control style for setting parameters works best. Directives are straightforward, decisions can be easily delegated, and functions are automated. Exhaustive communication among managers and employees is not usually required because disagreement about what needs to be done is rare. BEWARE being blinded to new ways of thinking and compliancy.

2. Complicated: Governing Constraints

Laws, rules, and codes create governing constraints. They give a sense of stability but are sensitive to change. They provide limits to what can be done. In terms of our policies and processes, these are hard-and-fast rules. They are context-free, which means they apply to everything, regardless of context. Remember to add in dissenting voices to challenge entrained thinking.

3. Complex: Enabling Constraints

Enabling constraints, though, are contextual. That means that they can be adapted or escaped for context. In policy and process terms, they're guidelines or heuristics. Leaders who try to impose order in a complex context will fail, but those who set the stage, step back a bit, allow patterns to emerge, and determine which ones are desirable will succeed. Shorten the feedback loop between researching, building, and learning.

4. Chaotic: No effective Constraints

A leader's immediate job is not to discover patterns but to stanch the bleeding. Communication of the most direct top-down or broadcast kind is imperative; there's simply no time to ask for input.

Appendix 4.2 Breaking Down the Goals into Nudges

Nudges are additional contextual information explaining what the H&MOC wants to do more of (INCREASE) or less of (DECREASE) to help achieve its Goals.

The Nudges are fully detailed in Appendix 5 Nudges & Digital Approaches**.**

The H&MOC recognises that the world is complex and whilst it is on a journey to achieve its long-term Goals and Vision, it may have to make small changes along the way to ensure it remains travelling in the right direction.

Extract from Appendix 5:

DMS Goal	Agile Medical Capability
Outcome	Medical Support to Operate - The provision of medical services to support an activity (to prevent and treat injury and illness, evacuate, recover, and return to duty any ill / injured Defence patient)
Nudges	**INCREASE** forward delegation of professional authority to enable personnel to perform emergency procedures beyond their usual scope of practice.
	DECREASE time taken to provide emergency care from POI (point of injury or illness)
	INCREASE capability for immediate lifesaving interventions at POI.
	INCREASE Medical intelligence (MEDINT) – identify and understand threats and inform medical risk assessments and decision making – enable strong linkages and sharing of intelligence with allies and partners, particularly where operating over a dispersed footprint
	INCREASE early warnings of health issues

Appendix 4.3 Critical Themes

Critical Themes represent a collection of Approaches that are tackling the same Goal/Nudge through a common suite of Digital Enablers.

This Appendix will eventually contain a detailed breakdown of the Critical Themes.

Critical Themes are groupings of Digital Approaches that will ultimately lead to a similar Digital Capability being delivered. For example, where the organisation needs multiple ways to allow geographically dispersed clinicians to talk to each other, they can use lots of different type of Digital Capabilities to do this, but they are all doing the same thing – they are allowing 'medical insight' to be transferred from one place to another. Therefore the theme is 'transfer of medical insight', that could contain instant messaging, video calls, text messaging, emails etc.

It will contain information on how the Critical Themes align to the Digital Approaches and how they should be incorporated into the different Business Capabilities – utilising our understanding of the Business Capabilities and Domain analysis. As this insight is not available, this version of the Digital Strategy will not contain the required breakdown of the Critical Themes.

Our Critical Enablers identified in 2022 due to our Nudges are:

1. Digitally Enabled Capture & Transfer of Medical Insight
2. Enhanced Insight through Knowledge and Information Exploitation
3. Digital Career Management and Workforce Planning
4. Simplified, Secure & Modern Infrastructure and Ecosystem
5. Process Digitisation
6. Patient Self Help (Empowerment) through Digitisation
7. Digital Transformation – Governance, Strategy, Training/Upskilling & Change
8. Deployed Power Generation and Storage
9. Deployed Local Networking and Connectivity to Core
10. National and International Logistics and Resupply
11. Deployed Hardware

See Appendix 5 for a link between the above Critical Themes and the Nudges they align to.

Theme 1: Digitally Enabled Capture & Transfer of Medical Insight	
A key enabler for any Function wishing to develop its knowledge management i.e. the capture and sharing of what people know. We must break down internal and geographical knowledge silos to build organisational resilience and our ability to act upon the right insight at the right time. Plus, we must ensure we don't forget what we already know over time. This becomes more important as service personnel are deployed for longer periods of time and the need to reach back to the firmbase for medical insight grows.	
Strategic Direction 2023/24	**How will this be delivered?**
Focus on 1) Digital Approaches that enable remote consultation in the deployed space, prioritising and sustaining digital services already proven in trials and 2) Digital Approaches that support the rigorous management of captured knowledge in the form of information – prioritising information linked to healthcare delivery.	Integration of deployed telemedicine systems to CORTISONE's electronic Health Record (eHR). Further trials of collection of point of wounding and observations data as close to the 'front line' as digitally possible to help define the future network and power needs for frontline digital care. Delivery of integrated care and record systems such as PACS, Health Content Management legacy information, eConsult to provide a richer form of information to improve decision making. Open up the use of CORTISONE data platform for the use of projects that will capture wearables physiological data to enrich the care record.

Theme 2:	Enhanced Insight through Information Exploitation
This theme represents a wide range of analytical digital capabilities that will provide DMS with a greater level of insight that would not have been possible through manual only approaches. The digital capabilities will gather, interrogate and where possible exploit novel cognitive capabilities like A.I., Machine Learning etc. to support the decision-making process.	
Strategic Direction 2023/24	**How will this be delivered?**
Focus on the fundamental Digital Approach to develop health needs analysis capability utilising medical data. Prioritising the deployment of, and embedding of, the new CORTISONE data platform, supported by an enhanced data governance framework that adheres to Defence Data Strategy.	CORTISONE release of its Data Platform in the Autumn of 2023 with live operational force preparation, force generation, and workforce data. This will have the capabilities for investigation as well as being able to apply AI methodology (e.g. machine learning) where appropriate. The platform will also then be available for the use of capturing trials of physiological data and clinical data from DMICP. Safe and effective use of data will be key to further develop our approach to population management, preventing ill health, injury and address health in equalities.

Theme 3:	Digital Career Management and Workforce Planning
A collection of digital approaches that support the management of employee careers and improved demand management i.e. the ability of Defence Medical Services to meet the demand signal and the resource requirements (skills, knowledge etc.) set by the Front Line Commands.	
Strategic Direction 2023/24	**How will this be delivered?**
Ensuring that are service staff have up to date training and those training records can be exploited along with e rostering data is key for use to maximize the productivity of our workforce.	Exploit training records within the CORTISONE Data platform with integrated links with a new Continuous Professional Development External Training Software Application and a new eRostering solution in 2024. CORTISONE Data platform will provide more regular data refreshes that will enable Unified Career Management with 'near' live data to enable the management of careers and maximise production.

Theme 4:	Simplified, Secure & Modern Infrastructure and Ecosystem
A holistic theme that provides the core digital infrastructure within Defence Medical Services to meet its current and future digital needs. Predominantly delivered by the CORTISONE Programme, this theme represents several key digital capabilities that come together to form the foundational and evergreen ecosystem; on which all current and future digital capabilities will need to integrate with.	
Strategic Direction 2023/24	**How will this be delivered?**
Full focus on the Digital Approach to remove reliance on legacy systems by introducing CORTISONE ecosystem which will be delivered iteratively. The CORTISONE data platform provides the secure infrastructure need to exploit data at a single point. This brings alignment to the new eco system and will allow exploitation of all additional digital capabilities as they become onboarded data exploitation and removing the need for extant, siloed, products.	Modernising the infrastructure (WIFI, PCs etc.) that is required to access CORTISONE services. Specific prioritisation on the stabilisation and replacement of legacy systems. Complete restructuring of the programme is required to enhance alignment to end user needs, improved focus on delivery and a sizable effort to rebuild confidence in the programmes ability to deliver – including increased efforts to deliver the supporting business change. In the deployed space, engagement with BMfS (Defence Support), Cap C4ISTAR and the STRATCOM Portfolio Office to ensure DPS/OpNET is tasked to deliver a "J4 OpNET Node" with appropriate SWaP and capability for medical and logistic users needing to run modern CORTISONE application where J6 support is limited.

Theme 5:	Process Digitisation
A collection of Digital Approaches that sit outside of Theme 4 and the core infrastructure and ecosystem. They provide a level of process digitisation i.e. any digital tools that allow the end user to follow a process more efficiently and effectively through automation techniques (PowerApps, Robotic Process Automation) that sit alongside the core ecosystem. They do not hold master data, but they are able to interface with master systems and typically support direct user interaction with the data.	
Strategic Direction 2023/24	**How will this be delivered?**
Focus on the general Digital Approach to use existing resource more effectively, by removing low value, manual tasks. Primary focus on cohering efforts across Defence Medical Services to prevent duplication of effort and recreating the wheel.	Work with FLCs to develop robotic processes to improve services at medical centre level, supported by the DMS CDIO department primarily, but seeking Defence Digital's Automation Centre of Excellence where required.

Theme 6:	Patient Self Help (Empowerment) through Digitisation
Also known as Patient Facing Services. Any Digital Capability that connects the end user with core data, whether it be their own personal data generated by wearable measurement devices, or information available (in an end users' friendly format) on core master systems. All with the intent to support the end user – the patient – in supporting themselves rather than seek formal clinical aid.	
Strategic Direction 2023/24	**How will this be delivered?**
Focus on defining the Functional remit and authority over the spectrum of self-help advice and digital services to prevent injury vs. advice once injury has occurred. Work closely with the People Function and Safety Function.	Trialling of WIRA product and completion of data insight work to inform future design April 24. Assessment of enterprise booking system to allow our patients to make appointments on line and check in online

Theme 7:	Digital Transformation – Governance, Strategy, Training/Upskilling & Change
A foundational theme that contains 4 key elements: 1) ongoing governance over the Digital Strategy and digital projects by the CDIO department and wider H&MOC Transformation programme – currently including HIP (Healthcare Improvement Plans), 2) development of all digital training needs by both end users and clinical staff, and 3) the support required to enable the H&MOC Transformation programme and any digitally aligned cultural change initiatives and 4) the ability to engage with end users through continuous feedback routes.	
Strategic Direction 2023/24	**How will this be delivered?**
Focus on maturing and embedding the HQ DMS CDIO department, the front door and portfolio process and Digital Board. The priority will be to embed the governance model across the Function and Single Services.	Agreed and funded operational model in place by April 2024. A future capability function which will work across all the single services and Med Op Cap to agree a programme of test and trials. A tested and effective front door process in place. A DMS digital programme and digital board will be in place to provide governance. Performance management of the service will be transparent to the service to allow the organisation to continue to shape the digital service.

Theme 8:	Deployed Power Generation and Storage
A key need in the deployed environment is to generate and store power to operate medical digital capabilities where local power supplies are not available or secure.	
Strategic Direction 2023/24	**How will this be delivered?**
Digitising medical care in a deployed environment will require increases in electrical power requirements far forward in the OPCP. DMS will focus on working closer with the Support Function to hand over the DMS requirements for the Support Function to deliver.	The responsibility for the provision of power for a medical facility rests with the single Services, however DMS CDIO will plays a key role in ensuring adequate power is available for technologies it deploys. We will select digital capabilities that minimise power usage and have flexible charging options. We will also articulate the power requirements of new capabilities to the FLCs early so they can be incorporated in planning assumptions, and finally we work across Defence to support trials of novel and developing COTS/MOTS power solutions that can be brough rapidly into service to meet operational needs.

Theme 9:	Deployed Local Networking and Connectivity to Core
A key need in the deployed environment is to provide the IT connectivity linking multiple digital capabilities together to form a local network and the ability to link this network to core Defence systems located in the Firmbase.	
Strategic Direction 2023/24	**How will this be delivered?**
DMS will focus on working closer with the Support Function to hand over the DMS requirements for the Support Function to deliver. Continue to work on small pilot projects to prove requirements and validate potential solutions.	Work is ongoing with Defence Support to compare the logistic and medical requirements for small form-factor OpNET IT systems capable of hosting a suite of application in the deployed space, similar to current RAVEN options. This joint demand signal will be fed via Cap C4ISTAR into Defence Digital with the aim of defining the requirements for a “J4 OpNET Node” with appropriate SWaP and capability for medical and logistic users needing to run modern CORTISONE application and medical peripherals where J6 support is limited. Discussion with Single Services to provision appropriate bearer systems will be needed. In the Maritime environment, the mixed infrastructure and long time between refits requires careful thought and planning to maintain services across the variety of basebands and domains in use.

Theme 10:	National and International Logistics and Resupply
The provision of medical supplies in the Firmbase and Deployed environment is critical to operational success. Medical assets can be blood supplies, bandages etc. any physical item that must be transported to the point of need.	
Strategic Direction 2023/24	**How will this be delivered?**
MoD use several stock systems these need to be reviewed to allow a DMS approach to be defined	Engagement with Defence Support will allow the DMS to understand the plan for updating logistic applications. It is likely that for the next 24 months Robotic Process Automation will provide the only method of ‘automatically’ entering data into Logistic systems.

Theme 11:	**Deployed Medical Hardware**
Unlike in the Firmbase, medical equipment that is suitable for the deployed environment must offer a greater level of robustness, security and transportability. Plus, with a growing need for deployed clinical staff to make quicker point of injury decisions, more often; there is a need for more dedicated hardware to help them make insightful decisions.	
Strategic Direction 2023/24	**How will this be delivered?**
Build DMS CDIO skills and resource to drive the understanding of medical hardware in the deployed space. Strengthen relationship with Support Function and DE&S and ensure all DMS digital hardware demands are fed through the DMS CDIO Front Door.	Resourcing a digital team to support the Capability and Acquisition process and Jt Med Cap Team ensuring the required level of support and an ILOD lead throughout the procurement cycle. Engagement with DE&S Chief Technology officer to unblock the procurement process for digital clinical equipment. Employment of a Technical Architect within CDIO to manage the roadmap for connected medical devices ensuring they are fit for purpose. Utilisation of the CDIO Front Door process to capture new digital requirements with a hardware element so they can be supported by a Through Life Management Plan. Work is ongoing to identify and remediate solutions such as Boothless Audiometry which are not fully integrated and do not have a TLMP.

Appendix 4.4 Maintaining the Golden Thread

Maintaining the Golden Thread is vital in ensuring traceability between the improvement projects and programmes we have and the high-level business needs.

The Golden Thread allows us to:

- Trace all projects and programmes to their originating driver and business Goal.
- Prevent duplication of effort if we can group improvements in a consistent way.
- Ensure we engage with partnering Functions if the impacted Business Capability is not one of our own e.g. it's possible a supply chain capability is owned by the Support Function or a HR capability is owned by the People Function.
- Build strong businesses cases for change since we can clearly show why they are needed.
- Ensure we consider all aspects of the digital changes required e.g. we consider our data, information and knowledge needs as well as the business, capability, application and technology views.
- Ensure we consider all the Defence Lines of Development (DLoD) elements (TEPIDOIL) when implementing a change.

Appendix 4.5 Guiding Principles

The following Guiding Principles shall steer of digital journey within the Function.

Principle 1: Management of Uncertainty

The approaches that will be taken to manage the uncertainty of today and tomorrow.

The future is unknown, but significant guidance is available from within Defence, NATO and our global partners on what the future may look like. To supplement this guidance the Function shall manage uncertainty through the following approaches, based upon the Clear, Complicated, Complex and Chaotic definitions details in the Cynefin framework.

High uncertainty = Build strategic resilience

Provide continuity of value and patient care over time whilst accommodating unexpected situations and unclear future needs

- For ongoing strategy management and responses to unplanned events (characterised by the Complicated, Complex domains) the Function shall utilise a broad, experienced and connected human network that has the authority to make timely decisions made using personal expertise and/or safe to fail experimentation - supported by relevant data and information.
- Peer to peer interconnectivity shall be promoted and enabled to identify opportunities, raise concerning strategic patterns and further develop digital approaches and nudges.
- By following an incremental approach to change and strategic nudges, the objective is to be more responsive to changes and events that cause the Function to alter direction. Ideally there will be multiple nudges identified to reach a goal that can be delivered in parallel to increase the probability of the goal being reached.
- The development of novel/innovative digital capability where there is little past experience to draw upon, and where digital capabilities are destined for the Complex domain, shall utilise a safe to

fail parallel experimentation principle. The Function shall support this approach through funding and an appropriate governance model.

- Projects shall utilise interdisciplinary teams and follow best practices when dealing with Complicated and Complex domains.

Low uncertainty = Build robustness

Maximising effectiveness and efficiency of business processes and continuous review and improvement

- Where digital approaches target capabilities destined for the Clear domain; robust solutions designed from predictable cause and effect risk planning shall be used.
- Continuous improvement and lessons learned will seek to manage uncertainty and ensure compliancy does not lead to stagnation or catastrophic process failure.

Appendix 4.6 Digital Governance Summary

The HQ DMS CDIO will retain accountability and authority over all DMS Digital projects and programmes and enable a Functional governance structure that interfaces with the wider Defence digital Boards and communities of practice.

- All digital demand shall go through the HQ DMS CDIO Front Door where it will undergo a triage. Post triage assessment the demand can be handed over to a project working group.
- If required digital demand can be escalated to the DMS Digital Board.

Appendix 4.7 Enterprise Architecture

To ensure we develop Digital Capabilities that are fully aligned to our Business Capabilities and the needs of the Function – whilst complying with Defence best practices, technology enablers and foundations and security requirements.

A key component of this strategy is the articulation of an enterprise architecture. There in an expectation that the architecture will be followed by all stakeholders developing digital capabilities though if any conflicts arise these should be brought to the attention of the HQ DMS CDIO. This is to ensure digital capability interopability, standardisation and prevention of any duplication of effort. The HQ DMS CDIO will ensure the Function adheres to the practices, standards and guidance from the central Defence Digital architecture community.

An enterprise architecture (EA) is a conceptual blueprint that defines the structure and operation of organisations. The intent of enterprise architecture is to determine how an organisation can effectively achieve its current and future objectives. Enterprise architecture involves the practice of analysing, planning, designing and eventual implementing of analysis on an enterprise.

The previous section defining our Business Capabilities forms part of the business layer within an enterprise architecture.

Proposed Logical Target Architecture – Digital Capabilities

The DMS CDIO maintains a model that represents a high-level view of the required Digital Capabilities, and potential application requirements based on the assumption that the applications used in Firm Base (primary and intermediate care) can be pulled through into the Deployed environment. For cost effectiveness, clinical safety, simplified user experience and training and maintenance of System of Record, Firm Base and Deployed services need to be the same applications.

Appendix 4.8 View the Need Holistically

When forming a project to create, improve or remove a digital capability, to support one or more Approaches, we must consider the implications on People, Processes and Tools.

We must consider the following in all our projects:

- Policies & Standards
    - What we must adhere to or follow when developing the Digital Capability
- People and Skills
    - The people, and skills required to implement and use the planned capabilities as well as any cultural change programmes required to ensure the uptake and correct use of the capabilities
- Processes
    - The processes that require the use of the Digital Capabilities. Where the digital capabilities will be used – SOPs etc.
- Data, Information & Knowledge
    - The data, information and knowledge required and created by the Digital Capabilities to enable the process
- Applications & Hardware
    - The applications and hardware that manages the data, information and knowledge and surfaces the insight to the user, during the process
- Infrastructure
    - The infrastructure that hosts the applications and hardware

The above is achieved when projects and programmes utilise the DLoD definitions used in Defence.

Appendix 5 Nudges & Digital

Appendix 5.1 What are Nudges?

Nudges are additional contextual information explaining what the H&MOC Function wants to do more of or less of to help achieve its Goals. The H&MOC recognises that the world is complex and whilst it is on a journey to achieve its long term goals and vision, it may have to make small changes along the way to ensure it remains travelling in the right direction. Nudges can be delivered in isolation or form a collection of activities delivered through a single Approach (Approaches are the way in which the H&MOC will utilise or change Capabilities to deliver a Nudge or Goal).

The master workbook containing the H&MOC Goals, Sub-Goals, Nudges, Digital approaches and their alignment to the Critical Themes is maintained by the HQ DMS CDIO department.

Appendix 6 AI

AI Opportunities

The H&MOC does not have a separate AI Strategy. The intention will be to include any AI capabilities into the overarching Digital Strategy. This will ensure there remains a Golden Thread between the Functional Goals and any AI capabilities developed.

The focus for 2022 – 2023 is to improve our data foundations including governance, quality performance and technology. Once the foundations are set our ability and capacity to extend exploitation to include AI will be realised, however we will continuously scan for potentially useful civil sector R&D and COTS AI solutions.

What are doing now:

- **AI Opportunities within the Operational Patient Care Pathways (OPCP**). Concurrently with the tangible progress being made within the data area, nearer term opportunities to exploit AI within the OPCPs are also being pursued. The HQ DMS Medical Operational Capability Team, alongside our Medical Scientific Advisor have secured funding (c.£100k) of Joint Experimentation Research and Innovation (JERI) funding for a piece of S&T research to identify and roadmap AI opportunities in the operational medical space. Work is on-going to pull together a team with the right mix of SQEP from DSTL and industry to deliver the project. With our initial focus on the OPCPs, the DMS is actively commissioning S&T to help understand our potential AI demand signal, to understand what the current market could deliver in this space and to roadmap potential steps that will be required to adopt novel AI technology.

- **Growing our AI expertise and understanding**. As an initial step HQ DMS has an SO2 on a Medical Care and Diagnosis PHD course. Elements of this course are looking at the use of AI within healthcare. The intent will be to transfer this knowledge back into the DMS. Early conversations indicate potential benefits of AI (particularly around the use of Machine Learning) in our research and academic areas. In addition, once the wider CDIO capability and expertise has matured, the DMS, as a matter of course, will integrate AI into its projects and programmes drawing upon the SQEP developed inhouse.

- **Partnering with the NHS**. While nothing yet has been formalised, our linkages into NHS Digital remain strong and therefore we anticipate the opportunities for partnering in this area to exploit economies of scale will increase as AI within the civil healthcare sector becomes more mainstream.

How AI Capabilities will align to our Business / Digital Capabilities Diagram

The following section represents examples of the use of AI in the medical domain. **This does not reflect the AI strategy for Defence Medical Services, it should be viewed as an 'art of the possible' and for interest only**. The examples have been taken from a single research paper (23).

AI Automated Analysis: Massive quantities, from sources such as high-resolution medical imaging, biosensors with continuous output of physiologic metrics, genome sequencing, and electronic medical records. The limits on analysis of such data by humans alone have clearly been exceeded, necessitating an increased reliance on machines.

AI Pattern Recognition: This largely involved pattern recognition using deep neural networks (DNNs) that can help interpret medical scans, pathology slides, skin lesions, retinal images, electro-cardiograms, endoscopy, faces, and vital signs

- Radiology – Interpretation of medical x-rays
- Dermatology - Algorithms classifying skin cancer by image analysis
- Ophthalmology – Diagnosing eye conditions based on images
- Cardiology – Interpretation of electrocardiograms (ECG) and echocardiograms for example diagnose heart attack
- Gastroenterology – Using machine vision, at high magnification

AI Patient Analysis:

- Mental Health - Digital tracking of depression and mood via keyboard interaction, speech, voice, facial recognition, sensors, and use of interactive chatbots
- Conditional Identification - AI algorithms to facilitate stroke, autism or electroencephalographic diagnoses for neurologists. Helping anaesthesiologists avoid low oxygenation during surgery. Diagnosis of stroke or heart attack for paramedics. Making the diagnosis of a congenital condition via facial recognition and pre-empting surgery for patients with breast cancer.
- Wearables: Ability to interpret data from blood pressure, heart rate and rhythm, blood oxygen saturation, respiratory rate, and temperature. For example ability to give user a haptic warning to record an ECG via the watch. Or using deep learning of the ECG pattern on the smartwatch, which can accurately detect whether there is high potassium in the blood, may provide particular useful-ness for patients with kidney disease.
- Medical Adherence - Some smart-phone apps are using AI to monitor medical adherence, such as the patient taking a selfie video as they swallow their prescribed pill

AI Knowledge Capture: Natural language processing to replace the need for keyboards and human scribes for clinic vis-its

AI Medical Coach: The virtual medical coach model with multi-modal data inputs and algorithms to provide individualized guidance. A virtual medical coach that uses comprehensive input from an individual that is deep learned to provide recommendations for preserving the person's health. Ability to interrogate and combine information obtained from: social behaviour, biosensors, physical activity, medication, family history, medical history, anatomy, etc.

AI Digital Twin: Patients would benefit from being informed of the best prevention methods, treatments, and outcomes for various conditions by their relevant twin's data, if environmental, socioeconomic, and behavioural data, including treatment and outcomes, were entered, an extraordinary learning system would be created.

Process Automation. The use of capabilities like Robotic Process Automation to completely remove the human from the completion of low value, repetitive tasks.

Appendix 7 Functional Activities

The 10 Functional Activities (9) are defined in JSP950 are shown below.

- Research and Innovation. The process of investigation and study that is used to develop concepts and practical applications that can contribute to the sustainment of health on operations.
- The Military Medical Contribution to Security & Stabilisation. Those areas where HSS can play a definitive role in delivering operational effect in addition to the Operational Patient Care Pathway (OPCP).
- Medical Logistics. (MedLog) is the process of procurement, storage, movement, distribution, maintenance and disposition of medical material and pharmaceuticals, including blood, blood components and medical gases, in order to provide effective HSS.
- Force Health Protection. FHP is defined as the conservation of the fighting potential of a force so that it is healthy, fully combat effective and can be applied at the decisive time and place.
- Pre-Hospital Emergency Care. PHEC is the continuum of emergency care provided to a casualty (by individuals or teams) from first clinical intervention at point of injury (POI) through to reception of the operational patient at DHC.
- Medical Evacuation. Is the movement of operational patients from POI up to DHC, under medical supervision in a designated transport platform equipped for role e.g. MEDEVAC (Medical Evacuation), TACEVAC [Tactical Evacuation] and STRATEVAC (Strategic Evacuation).
- Primary Health Care. PHC is those comprehensive community medical services that contribute to the protection, maintenance and restoration of the health of the Defence PAR.
- Deployed Hospital Care. DHC is those clinical services provided by clinical personnel usually employed within hospitals.
- Medical Command, Control, Communication, Computers and Information. Med C4I (Medical Command, Control, Communication, Computing*, Information, Surveillance and Reconnaissance) is the authority, processes, communications architecture and information management resources employed in managing the DMOC system.
- Firm Base. Capabilities that provide health services support (HSS) to the Defence PAR within the Firm Base less Royal Centre for Defence Medicine (RCDM) and Defence Medical Rehabilitation Centre (DMRC) which are Role 4 operational.

Appendix 8 Bibliography

1. (n.d.). *David Snowden, The Cynefin Framework.* https://thecynefin.co/.

10. (n.d.). *Avoiding the Walker Dip: A, Strategic Delivery Plan for DMS Research 2021-26.*

11. (n.d.). *roadmap-for-digital-and-data-2022-to-2025*. Retrieved from https://www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025/transforming-for-a-digital-future-2022-to-2025-roadmap-for-digital-and-data

12. (n.d.). *techlinkcenter.org*. Retrieved from https://techlinkcenter.org/news/zoll-medical-licenses-patient-monitoring-app-batdok-from-air-force

14. (n.d.). *Defence Operating Model*. Retrieved from DOM: Defence Operating Model: https://modgovuk.sharepoint.com/sites/DOM

15. (n.d.). *Defence Tasks*. Retrieved from Defence Tasks: https://modgovuk.sharepoint.com/sites/DOM/SitePages/bSTR004.aspx

16. (n.d.). *Military Command Plans*. Retrieved from Military Command Plans: https://modgovuk.sharepoint.com/sites/DOM/SitePages/bPLA021.asp

17. (n.d.). *Defence Outputs*. Retrieved from Defence Outputs: https://modgovuk.sharepoint.com/sites/DOM/SitePages/ahdw0022.aspx

18. (n.d.). *Defence Strategy*. Retrieved from Defence Strategy: https://modgovuk.sharepoint.com/sites/DOM/SitePages/bSTR002.aspx

19. (n.d.). *Defence Command Paper (DCP)*. Retrieved from Defence Command Paper (DCP): https://modgovuk.sharepoint.com/sites/DOM/SitePages/bPOL002.aspx

2. (n.d.). *Cynefin weaving sense-making into the fabic of our world*. Retrieved from https://thecynefin.co/sensemaker/

20. (n.d.). *Integrated Review (IR)*. Retrieved from Integrated Review (IR): https://modgovuk.sharepoint.com/sites/DOM/SitePages/bPOL002.aspx

21. (n.d.). *Defence Plan*. Retrieved from Defence Plan: https://modgovuk.sharepoint.com/sites/DOM/SitePages/bPLA005.aspx

22. (n.d.). *Healthcare-and-Medical-functional-strategy-launched*. Retrieved from https://modgovuk.sharepoint.com/sites/intranet/SitePages/Healthcare-and-Medical-functional-strategy-launched.aspx

23. (n.d.). *high-performance_medicine_the_convergence_of_human_and_artificial_intelligence_nature_medicine_volume_25*. Retrieved from https://www.sbra.be/sites/default/files/1._topol_j._e._high-performance_medicine_the_convergence_of_human_and_artificial_intelligence_nature_medicine_volume_25_january_2019.pdf

24. (n.d.). *The NATO Future Medical Support Concept*. Retrieved from https://www.innovationhub-act.org/sites/default/files/docs/FMSC%2020190814.pdf

25. (n.d.). *Defence Cyber Strategy*. Retrieved from https://modgovuk.sharepoint.com/:b:/r/sites/IntranetDefenceDigital/Documents/Cyber_Resilience_Strategy_for_Defence.pdf?csf=1&web=1&e=qYdb9x

26. (n.d.). *Defence AI Strategy*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1082416/Defence_Artificial_Intelligence_Strategy.pdf

27. (n.d.). *HIST Working Group*. Retrieved from https://www.coemed.org/

28. (n.d.). *COEMED*. Retrieved from https://www.coemed.org/resources/comeds

29. (n.d.). *ACT*. Retrieved from https://www.act.nato.int/

3. (n.d.). *Digital Strategy for Defence.* Retrieved from https://modgovuk.sharepoint.com/:b:/r/sites/20100/Shared%20Documents/Digital%20Strategy%20for%20Defence%202021.pdf?csf=1&web=1&e=gOynZL

4. (n.d.). *sergiocaredda.eu*. Retrieved from strategy-frameworks-the-theory-and-the-practice: https://sergiocaredda.eu/organisation/organisation-design/strategy-frameworks-the-theory-and-the-practice/

5. (n.d.). *op.europa.eu*. Retrieved from https://op.europa.eu/en/publication-detail/-/publication/712438d0-8c55-11eb-b85c-01aa75ed71a1

6. (n.d.). *jsp441*. Retrieved from https://jsp441.r.mil.uk/index.php/Government_Knowledge_and_Information_Management_(KIM)_Professional_Skills_Framework_Knowledge_Management

7. (n.d.). *Defence Data Analytics Platform (DDAP) Business Architecture Document.*

8. (n.d.). *civil-service-government-knowledge-information-management-profession*. Retrieved from https://www.gov.uk/government/organisations/civil-service-government-knowledge-information-management-profession/about#:~:text=The%20Government%20KIM%20(%20GKIM%20)%20profession,underpin%20the%20work%20of%20government.

9. (n.d.). *THE OPERATIONAL PATIENT CARE PATHWAY*. Retrieved from THE OPERATIONAL PATIENT CARE PATHWAY, https://modgovuk.sharepoint.com/sites/defnet/DINSJSPS/DINSJSPS/20151214.1/20151210-Operational_Patient_Care_Pathway_JSP_950_Lft%201-4-1v2.0.pdf#search=patient%20care%20pathway