Development and Deployment of a Headquarters Maturity Model - A Case Study

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Abstract

Maturity Models are common tools for capability development and monitoring across commerce and industry. Such models typically define a number of organisational features, each with several levels of maturity. An organisation can use a Maturity Model to assess its areas of strength and weakness to develop and prioritise actions needed for self-improvement. The UK MOD's Joint Concept Note 2/17 ("Future of Command and Control") introduced an initial HQ Maturity Model (HQMM) in 2017. Since then, Dstl has continued to explore the use of maturity models to support development of Command and Control (C2) capability by Operational level military headquarters (HQs). Working in partnership with six UK HQs, notably UK Strategic Command Permanent Joint Headquarters (PJHQ), a generic HQMM was developed for wide application across the UK Defence enterprise. The current model has eighteen so-called 'Dimensions', each with five maturity levels, and examples of measures and metrics as a starting point for organisations to develop a specific model that is tailored to their needs. This paper describes the design and evolution of the HQMM and discusses ways it might be used by military organisations as a tool to support continuous improvement efforts.

1 Overview

This paper describes the development and evolution of a maturity model to support the capability development of operational defence headquarters (HQs), and highlights lessons for future development and for other organisations considering the use of similar maturity models and approaches.

Maturity Models have, for some time, been a common tool for capability development and monitoring across commerce and industry. Models typically define a number of organisational features (called "Dimensions" in our study), each with several levels of defined maturity. An organisation can use a Maturity Model to assess its areas of strength and weakness, and hence develop and focus actions to improve its overall maturity or capability.

Since 2015, Dstl has been considering the use of maturity models to support development of Command and Control (C2) capability at the Strategic and Operational level. The MOD's Joint Concept Note 2/17 ('Future of Command and Control') introduced an initial HQ Maturity Model (HQMM) in 2017, with five defined levels of maturity. This was further developed by Dstl, in consultation with the UK's Permanent Joint Headquarters (PJHQ) and other HQs.

In 2021 a team, sponsored by Dstl, re-engaged with PJHQ to further develop the nascent HQMM to support a HQ change initiative. Through engagement with senior staff across the HQ, the team updated and validated the model's Dimensions and maturity level descriptions to meet their needs. In parallel, opportunity was taken to develop a generic maturity model that could have wider application across other UK Defence HQs.

An initial generic HQMM, which was used as a starting model, had 15 Dimensions (*Leadership, Training & Development Cognition, Behaviours & Culture, Knowledge Management, Internal Processes, Innovation & Experimentation, External Interfaces, Governance & Assurance, Structures, Integration, Personnel, Skills and Competencies, Information Management, Information Exploitation, Technical Architecture and Infrastructure*). Each Dimension had five defined maturity levels along with suggestions for measures and metrics to support assessment. It was intended for use as a basis for individual HQs to develop a HQMM tailored to their specific needs. Self-assessments, using a tailored HQMM, would allow a HQ to identify areas for development and to monitor progress towards desired states over time.

Over a period of six months, the study team engaged with 1* and 2* UK HQs (five HQs in total), assisting them in tailoring the HQMM to their needs and gathering feedback. Based on stakeholder feedback, some Dimensions were re-worded and three new ones were added: *Continuous Improvement, Self-Awareness and*

Deployability. Written guidance on how to tailor the HQMM and apply it was also informed by feedback.

We consider the refined generic HQMM to be fit for purpose for use by operational military HQs to support their development. The generic nature of the model should allow its use by other defence organisations, including those in other nations. Lessons have been identified regarding the use of such models, as have opportunities for further development and exploitation.

2 Maturity Models

2.1 Background

Maturity Models are widely used in industry and commerce as a benchmarking or self-assessment tool, as part of change management and capability improvement programmes.

A maturity model typically defines a number of features of an organisation or management process, along with definitions that characterise different levels of 'maturity' for each of them. Maturity in this context was originally defined to be *'the state of being complete, perfect, or ready*' [1], but more generally can be considered as how well a feature is developed and optimised to support the organisation's goals. These definitions allow an organisation to assess its 'maturity level' across the various features, building a picture of the organisation's strengths and weaknesses, which can then be used to develop plans and strategies for improvement.

The widespread use of maturity models can be traced back to the development and publication by Carnegie Mellon University's Software Engineering Institute of a Capability Maturity Model (CMM) in 1987. The CMM was developed, principally for the US Department of Defence (DoD), to measure the maturity of software development practices. CMM evolved into CMMI (Capability Maturity Model Integration) [2], which integrates a suite of tools designed to help improve processes and behaviours across a wider range of industries.

Following the success of CMMI, maturity models have been developed to cover a wide range of disciplines, including Information Technology, Human Resource Management (see [3], for example) and Business Process Management [4].

3 Early HQMM Development

3.1 Overview

This section describes how the HQMM was developed, from its initial roots, through development to support a specific HQ change programme, then development of a generic model.

In 2016, Dstl developed a HQMM to assess the manner in which a military HQ was operating. This maturity model was described in Joint Concept Note (JCN) 2/17 – 'The Future of Command and Control' [6]. Since then, Dstl has worked to develop and evaluate the HQMM concept with several military HQs. This paper describes some of these activities and a new generic HQMM.

3.2 Initial Development

3.2.1 Predecessors

The origins of the generic HQMM can be traced back to the NATO NEC C2 Maturity model [2], developed by CCRP[1] in 2010. Building on previous studies, this model recognises that C2 can be considered from a number of dimensions, and uses this concept to develop a "C2 Approach Space" [5]. It goes on to define five different C2 Approaches (Conflicted C2, De-Conflicted C2, Coordinated C2, Collaborative C2, and Edge C2), broadly relating to different levels of C2 maturity. In this case maturity was considered to represent the level to which the C2 approach is more 'network-enabled' or 'network-centric'.

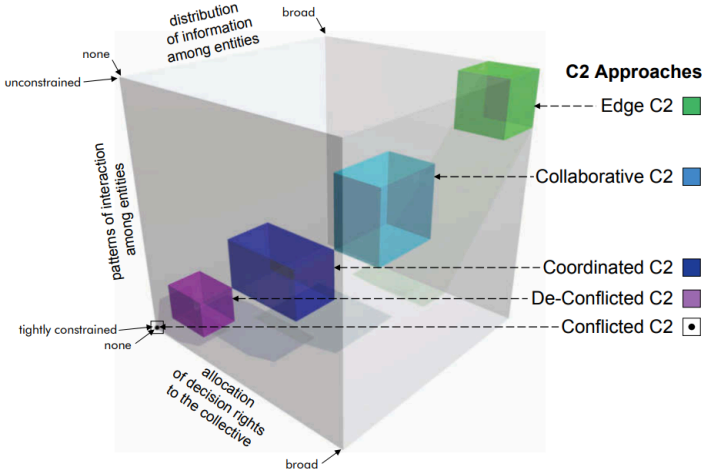

Figure 1: C2 Approaches as regions in the C2 Approach Space *(taken from [5]).*

The concepts behind the NATO NEC C2 Maturity Model were further developed in JCN 2/17 [6], which was written to assist UK Defence in the development and implementation of "*an enduring and agile C2 capability*" in order to "*maintain its competitive edge in response to future threats and challenges, both expected and unexpected*." JCN 2/17 introduced a HQMM, describing

[1] Command and Control Research Program (CCRP) was a DoD Research Program, housed within the Office of the Assistant Secretary of Defense, and active from 1994 to 2015. It aimed to improve the theory and practice of C2 and enhance DOD's understanding of the implications of the "Information Age".

five levels of effectiveness and competence (maturity levels) "*along which headquarters may progress from basic capabilities at level 1 to advanced capabilities at level 5*":

- Level 1 – Functional HQ
- Level 2 – Optimised HQ
- Level 3 – Unified HQ
- Level 4 – Adaptive HQ
- Level 5 – Agile HQ

Each level was defined in terms of both the HQ's information capabilities and its ability to become more adaptive and agile. The JCN does not, however, provide a method or approach for assessing the maturity of a HQ.

3.2.2 Partnering with PJHQ

In partnership with PJHQ, Dstl conducted further refinement and development of the HQMM between 2018 and 2020, introducing a number of 'Dimensions', against which the performance of a HQ might be assessed (not shown).

Building on this work, we undertook a study in 2021 to refine and re-apply this model in direct support of an internal change programme that sought to improve the capability of PJHQ. We initially compared the HQMM Dimensions with the aims and objectives of the change programme. We then interviewed staff to discuss how they might use a HQMM and how to best describe elements of the model for their areas of responsibility. A tailored HQMM was subsequently developed to meet PJHQ's specific needs of the change programme (not shown).

4 Generic HQ Maturity Model Description

4.1 Overview

Building on knowledge and understanding gained through partnering with PJHQ, we decided to develop a model that might be used by a range of HQs: this section describes how we developed a generic HQMM.

4.2 Overall Structure

The initial generic HQMM was derived from engagement with military HQs and our knowledge of C2 practices. It contained fifteen Dimensions against which a HQ's maturity might be evaluated via a structure based upon the widely used Process, Organisation, Technology and Information (POTI) model from *Managing Successful Programmes* guidance. We added People as a distinct entity, rather including under Organisation, given the importance of people and social interactions for C2 to be effective. The high-level structure is shown in Figure 2.

HQMM Criteria	HQMM Dimensions
PEOPLE	Leadership
	Training & Development
	Cognition
	Behaviours & Culture
	Knowledge Management
PROCESS	Internal Processes
	Innovation & Experimentation
	External Interfaces
ORGANISATION	Governance & Assurance
	Structures
	Integration
	Personnel, Skills & Competencies
TECHNOLOGY & INFORMATION	Information Management
	Information Exploitation
	Technical Architecture & Supporting Infrastructure

Figure 2: Initial Generic HQMM Dimensions

When building a generic model, we recognised that some Dimensions may not be applicable to a particular HQ and, equally, some dimensions deemed important by a HQ might be missing. This was reflected in guidance to HQ staff that Dimensions can be removed or inserted to match their needs.

4.3 Dimension Descriptions

4.3.1 Overview

Dimension descriptions form the core of the maturity model. Each Dimension is described on a single page with a common format. Figure 3 shows an example of a Dimension description page.

Each Dimension Description page is made up of the following sections.

4.3.2 Scope and definition

This section describes what is included in the Dimension and the associated HQ capabilities. For example, the definition of the Knowledge Management (KM) Dimension is as follows:

"*This concerns [The HQ]'s ability to identify, capture, retain, reuse, share, distribute and exploit the knowledge, skills and experience (KSE) held by the HQ's own staff and systems, within and beyond the organisation, to allow the HQ to best enable [HQ purpose] for Defence across [Operate and Warfight].*"

HQs should tailor words in square brackets to their needs, as described in section 4.3.5.

People – Knowledge Management (KM)

This concerns [The HQ]'s ability to identify, capture, retain, reuse, share, distribute and exploit the knowledge, skills and experience (KSE) held by the HQ's own staff and systems, within and beyond the organisation, to allow the HQ to best enable [HQ purpose] for Defence across [Operate and Warfight].

Maturity Levels and Descriptions

5	Effective and efficient KM processes are integral to all [The HQ] activity, supported by highly effective and efficient KM tools that are easily accessible to all staff. KSE are centrally managed and KM is well understood by staff at all levels, who also understand how they can contribute and improve [The HQ]'s KM performance. Lessons and expertise are routinely identified and exploited to improve HQ performance.
4	Effective and efficient KM processes exist throughout [The HQ], supported by suitable KM tools that are accessible to all. KM processes are understood by most/all staff and are centrally managed in an effective manner and by consistent KM processes. [The HQ] seeks to improve its KM processes where appropriate. Lessons and expertise are regularly identified and exploited to improve HQ performance.
3	Established processes for effective KM exist. [The HQ] mostly understands the KSE at its disposal and generally utilises these to deliver required outputs and outcomes. Reasonably effective KM tools are available to staff, who benefit from a centralised and consistent KM approach. Lessons and expertise are often identified and occasionally exploited to improve HQ performance.
2	Developing process for KM is ongoing. [The HQ] has some understanding of the KSE at its disposal and attempts to best utilise these to deliver required outputs and outcomes, although often fails to do so. Some suitable KM tools are available to the staff and there is an attempt to implement consistent, or centralised, KM processes. Lessons and expertise are occasionally identified and exploited to improve HQ performance.
1	[The HQ] does not really understand or manage the KSE at its disposal, or best utilise these to deliver required outputs or outcomes. Suitable KM tools are not available to staff and there is no consistent or evident KM process. Lessons and expertise are rarely identified or exploited to improve HQ performance.

Candidate Metrics *(What areas could be considered?)*	**Candidate Measures** *(What could be measured?)*	**Candidate Indicators** *(What might be observed?)*
Level of KM skills amongst HQ staff. Level of effective KM application within HQ. Level of knowledge gathering interviews/discussions held. Level of knowledge recorded. Existence of centralised KM tools/database.	Proportion (%) of staff trained in KM. Proportion (%) of arrival interviews conducted. Proportion (%) of mid-term interviews conducted. Proportion (%) of departure interviews conducted. Number of identified lessons. Proportion (%) of identified lessons implemented.	Established KM strategies adopted across [The HQ]. Good KM encouraged. Effective KM tools available. Active capture of knowledge as staff join [The HQ]. Active capture of knowledge before staff leave [The HQ]. KM is addressed by [The HQ] Lessons Identified process and systems. A catalogue of knowledge and experience in current and former HQ staff.

Figure 3: Knowledge Management Dimension Description Page.

4.3.3 Maturity Level Descriptions

This section provides a description characterising the HQ at each of five maturity levels, ranging from Level 1-5 (least to most mature). These descriptions act as a guide for HQ staff when assessing current and desired levels of maturity (i.e. a gap analysis).

For example, Level 4 maturity level for KM is:

"*Effective and efficient KM processes exist throughout [The HQ], supported by suitable KM tools that are accessible to all. KM processes are understood by most/all staff and are centrally managed in an effective manner and by consistent KM processes. [The HQ] seeks to improve its KM processes where appropriate. Lessons and expertise are regularly identified and exploited to improve HQ performance.*"

4.3.4 Metrics, Measures and Indicators

As well as a subjective assessment based on the level descriptions, HQs generally desire more objective assessments of maturity. Ideally, there should be simple and easy to collect numerical measures, but this is rarely the case for measuring HQ performance. Therefore, in order to support HQs develop ways to monitor progress, the generic HQMM includes:

- Candidate Metrics – Observable but hard to measure features of the HQ, its staff and processes. A typical example from the KM Dimension is "Level of KM skills amongst HQ staff."
- Candidate Measures – Measurable features or characteristics, which can be given an objective figure or measurement. An example might include "Proportion of the staff that have received formal KM training".
- Candidate Indicators – Observable activities or characteristics that indicate that a Dimension is being addressed or enhanced. An example from the KM Dimension is "Active capture of knowledge before staff leave the HQ."

4.3.5 Text Placeholders

The generic HQMM contains text contained in [square brackets]. These are intended as placeholders that can be replaced with appropriate text using "*Find and Replace*", allowing the HQMM to be customised to a specific HQ:

- [The HQ] – the HQ's name or abbreviation.
- [HQ purpose] – a succinct phrase to describe the purpose or function of the HQ (e.g. "provide deployed logistic support to operations")
- [Operate and Warfight] – a phrase that describes the context within which the HQ operates (e.g. "operational activities").

It was considered that replacing generic terms with specific ones would improve the likelihood that the HQMM would be fully adopted by HQ staff.

The initial generic HQMM was published and shared with Dstl and PJHQ in September 2021 (not shown).

5 Consolidation and Refinement with Wider HQs

5.1 Overview

After positive feedback from PJHQ and Dstl, we decided to work with other UK Defence HQs in order to:

- Test and refine the generic HQMM through engagement with a wider audience.
- By mutual agreement, support development of a HQMM tailored to the HQ's needs.

We worked with five HQs, and in each case a tailored HQ HQMM was developed from the generic model. The tailoring of the individual HQMMs and associated discussions with HQ staff provide insights about the content and structure of the generic HQMM, and influenced its development in an iterative manner.

5.2 Approach

The five organisations we worked with were:

- HQ Commander United Kingdom Strike Force (HQ CSF) (2*).
- Standing Joint Force Headquarters (SJFHQ) (2*)
- HQ Standing Joint Force Logistics Component (SJFLogC) (1*).
- HQ Defence Supply Chain Operations and Movements (DSCOM) (1*).
- UK Space Command (UKSC) (2*).

To provide a rapid turnaround, and to minimise disruption for the host HQ, we developed a sprint engagement approach, conducted at the HQ over two days. A typical engagement is described here:

Day 1

- 0900 - Meet HQ lead for capability development (typically OF4[2] level) for initial discussions.
- 1000 – Meet key sponsor (typically OF6[3] - Chief of Staff OS and/or Commander) to:
    - Introduce the generic HQMM.
    - Discuss how the HQMM could be used.
    - Understand specific needs and priorities of the HQ and any extant strategies or current activities which might guide the tailoring of the HQMM.
- AM/PM: Working on-site to refine and tailor the HQMM.
- 1600: Discuss progress with HQ lead.

Day 2

- AM/early PM: Continue working on-site to develop the tailored HQMM.
- 1500: Wash-up meeting with key sponsor and HQ lead to:
    - Present a tailored HQMM.
    - Discuss any further development work to be undertaken by the HQ.
    - Discuss how the model might be used.
    - Gather feedback on the model.

Following engagement with each HQ the generic HQMM was updated to incorporate feedback.

This approach proved successful and provides a methodology for future engagements with HQs. Those HQs we engaged considered the burden upon them to be minimal, whilst leaving them with a 'usable' tool after two days.

5.3 Changes Made As a Result of HQ Engagement

As a result of HQ feedback several changes were made to a revised generic HQMM (see Figure 5) including:

- Changes in wording in Dimension definitions and descriptions to improve clarity and to reduce ambiguity.
- Re-titling of the "*Leadership*" Dimension to "*Leadership Models*", with associated text changes.
- Addition of three new dimensions:
    - *Continuous Improvement* – to reflect the ability of a HQ to continually improve its operational capability, integrated across all Defence Lines of Development[4] (DLoDs).
    - *Self-Awareness* – capturing the collective and individual awareness of the internal structures and processes of the HQ, and the HQ's role in its wider C2 enterprise.
    - *Deployability* – reflecting the ability of the HQ to deploy and its capacity to operate in deployed environments.

6 Final Generic Model

Following the refinement and consolidation process, a revised version[5] of the generic HQMM was developed, reviewed and published. This version has been packaged into a format designed to facilitate its use by HQs, and is structured as follows:

- *Introduction* – Introductory *text briefly explaining the content of the HQMM, and suggestions for its use by a HQ.*
- *Dimension Descriptions – One-page descriptions of each Dimension, including:*
    - A definition *of the scope of the Dimension.*
    - Descriptions of *maturity levels 1-5.*

[2] OF4 is equivalent to Commander/Lt Colonel/Wing Commander

[3] OF6 is equivalent to Commodore/Brigadier/Air Commodore

[4] UK MOD defines nine aspects of capability (Training, Equipment, Personnel, Information, Concepts & Doctrine, Organisation, Infrastructure, Logistics, Interoperability), serving a similar function to the DOTMLPF structure used in the US and elsewhere.

[5] Generic HQMM Version 4.0 (dated 31 March 2022).

- Candidate *measures, metrics and indicators, which can help a HQ identify their current or desired maturity level.*
- *An Annex suggesting ways to tailor the HQMM to meet* the *needs of a specific HQ.*
- *An Annex suggesting ways to use the HQMM as part of a process to improve HQ performance.*

HQMM Criteria	HQMM Dimensions
PEOPLE	Training & Development
	Cognition
	Behaviours & Culture
	Leadership Models
	Knowledge Management
PROCESS	Internal Processes
	Innovation & Experimentation
	Continuous Improvement
	External Interfaces
ORGANISATION	Self-Awareness
	Deployability
	Governance & Assurance
	Structures
	Integration
	Personnel, Skills & Competencies
TECHNOLOGY & INFORMATION	Information Management
	Information Exploitation
	Technical Architecture & Supporting Infrastructure

Figure 5 Revised Generic HQMM

7 Using a HQMM

7.1 Overview

As discussed earlier in this paper, the HQMM is designed to support HQ self-assessment as part of a continuous improvement process. It can be used in a number of ways as a tool to support this goal, including:

- To generate a snapshot of HQ maturity.
- To enable monitoring of HQ development over time.
- To identify focus areas for improvement activity.
- To provide evidence of gaps that are beyond the control of the HQ to inform decision-making by higher authorities.

7.2 Tailoring the HQMM

Before it can be used to best effect, the generic HQMM needs to be tailored to match the HQ's requirements. A staged approach is proposed to assist HQ staff with this step.

7.2.1 Replacement of Text Placeholders

The generic HQ contains some text contained in [square brackets]. These are intended as placeholders that can be replaced with appropriate text using "Find and Replace" functionality of Microsoft Word - see Section 4.3.5.

7.2.2 Selection of Dimensions

The HQMM currently includes eighteen dimensions, but not all will be applicable to, or have equal importance for, a HQ. For example, the dimension "Deployability" will not apply to HQs that do not deploy. A HQ may wish to simplify their own version of the HQMM by deleting (or greying out) Dimensions that are not relevant.

7.2.3 Rewording of Maturity Level Descriptions

The Maturity Level Descriptions in the generic HQMM have been developed to have broad applicability, but a HQ may wish to rephrase them to use language and terms that were more applicable to their staff. Note that if a Level Description is re-worded, then all other Level Descriptions in that Dimension may also need changing for consistency.

7.2.4 Selection and Generation of Indicators, Metrics and Measures

The Indicators, Measures and Metrics listed under the Dimensions are deliberately generic: HQs should generate Indicators, Measures and Metrics that address their specific activities and roles.

7.3 Challenges of Deploying a HQMM

Whatever the HQMM is used for, the process adopted must strike a balance between staff time required, depth of analysis, breadth of staff consulted, and utility of outputs.

Whilst the use of a HQMM is straightforward in principle, there are several practical challenges. Ideally, the HQMM is used to capture the views and assessments of a wide range of staff from across all parts of the HQ to assess maturity and identify actions for improvement. However, in practice, a number of barriers present themselves.

- *Time*. HQs are busy places and time for activities such as organisational maturity reviews is often deemed low priority. Therefore, the simpler the HQMM and associated processes are, the more likely it is that staff will incorporate it into busy schedules.
- *Questionnaire fatigue*. Staff are often subjected to numerous requests to fill in questionnaires and surveys. These are simple to administer by those requiring information, especially with the advent of tools such as MS Teams, MS Forms and Survey

Monkey. However, the cumulative impact on staff can be significant, leading to a tendency to either ignore requests, or to complete the survey in as little time as possible, with little thought given to answers.

- *Stovepipes*. Defence HQs are typically segmented by specialism or function (for example as J1-9 branches). Whilst this is valuable for efficiency and effectiveness, it can limit (stovepipe) the scope of cross-Branch knowledge and experience, with the consequence that no individual has a full understanding of all aspects of the HQ or its challenges and shortcomings. In order to conduct a comprehensive review of maturity, it is therefore necessary to gather information from across the organisation and combine disparate responses into an overall assessment.

In addition, it must be noted that a HQMM will only be of value when it is embedded in a defined and supported improvement process. A maturity assessment, however thorough and accurate, offers no benefit unless it leads to changes and organisation-wide action to resolve shortcomings that advance the maturity of the HQ.

7.4 Potential Deployment Approaches

Every HQ will have a view on how best to apply the HQMM to gain maximum value whilst minimising the burden on staff. Three contrasting approaches are outlined below, along with their benefits and drawbacks. This list is not exhaustive; HQs might apply a variation that best suits their situation.

7.4.1 HQ-Wide Survey

With this approach, the HQMM is issued to the entire HQ, along with a questionnaire, asking all staff to:

- Assess and score the entire HQ's maturity against each Dimension as best they can.
- Suggest improvement options for some Dimension.

Scores can then be analysed to calculate an overall HQ maturity score for each Dimension, and suggestions collated and mined to develop descriptions of current shortfalls and potential actions for improvement.

The HQ-wide survey is simple and easily understood. It can be conducted electronically across a dispersed HQ, minimizing disruption and allowing staff to conduct the assessment at a convenient time.

However, busy HQ staff may not give the survey the attention and effort it requires, or indeed may ignore it completely. In addition, this approach precludes opportunities for collective discussion and the exploration of underlying factors affecting maturity shortfalls.

7.4.2 Infrequent Sampling

Under this approach the burden on staff would be minimised by asking them for 'rolling' maturity assessments and comments against smaller subsets of the HQMM, but on a regular basis. For example, once a week a log-on pop-up could be used requesting a single digit (1-5) assessment against just one Dimension, as well as a chance to insert a comment or improvement suggestion pertaining solely to that Dimension. This would minimise the burden on staff to a few minutes per week, and when implemented across a HQ can yield a significant stream of responses over time. However, it takes a significant time to cover all Dimensions or areas of interest, and, like the HQ wide survey, offers no opportunities for collective discussion and exploration.

7.4.3 Collective decision-making

An alternative to these two remote approaches is to employ collective discussions to generate agreed maturity scores and to capture the rationale for scores and identify actions that might close significant maturity gaps. A process to achieve this might be as follows:

- Distribute the HQMM to all members of the HQ and ask staff to consider levels of maturity for their areas of responsibility and wider HQ functions.
- Within each department/section/cell, hold a time-bound discussion (e.g. 60 minutes) to agree a collective maturity scores, along with a rationale and any improvement options, and submit these for collation.
- Hold a pan-HQ event with representatives of each of the departments/sections/cells/branches. For each Dimension of the HQMM, agree a consensus score and rationale (noting conflicting views). The opportunity can also be taken to seek participants' views on areas of HQ performance that require most attention, and to collate ideas on ways to improve HQ performance against performance gaps for further analysis.

This process allows for a more thorough exploration of issues facing a HQ, generate evidence-based scores for HQ maturity, derived from self-assessment. It also provides the HQ command team with their staffs' views of how HQ performance might be improved. Some ideas may be 'quick wins' whilst some might require cost-benefit analysis before incorporation into HQ improvement plans.

It does, however, require considerably more staff time and is more difficult to manage and facilitate, especially when a HQ is geographically distributed.

8 Observations

The following observations have been made through the course of this task.

8.1 The Use of Maturity Models for Military HQs

Throughout the work described in this paper, the concept of using maturity models as a mechanism for assessing and developing HQ capability was welcomed by staff. Most quickly assimilated the underlying principles and recognised its utility for self-assessment and exploration of options to addressing HQ shortcomings.

8.2 HQMM Structure and Size

Discussions with HQ staff confirmed that the size of the HQMM, both in terms of number of dimensions (18) and maturity levels (5), are appropriate for this application. The number of dimensions is higher than that of some maturity models in commercial applications. However, this is off-set by the fact that before use the HQMM is intended to be tailored by a HQ to current development goals, discarding those dimensions that are not relevant or are less important.

8.3 Embedding a HQMM within a process

As noted in this paper, a HQMM is of little value in itself; it should be embedded in a HQ development process in order to deliver improvements. The process will dictate how results of maturity assessments will be exploited, which in turn will impact on how the HQMM is tailored for HQ use. Embedding the HQMM in a defined process can also help staff visualize gaps and activities designed to address key gaps, which might improve the quality of staff engagement in a HQ change process.

8.4 Scores versus Insights

As a HQMM provides numerical scores for maturity, it is tempting to see its principal role as providing a way to assign numbers to Dimensions and an overall score of 'HQ maturity'. However, more value is gained through active discussion and debate for areas staff disagree about levels of maturity: the rationale for a score is more important than the score. Airing all perspectives can help generate a deeper understanding of HQ gaps, which in turn can help generate a consensus for HQ development priorities.

8.5 Single versus Tailored HQMMs

During the development of the HQMM, the concept of using a single HQMM for multiple HQs was discussed. This would offer the advantage of a consistent structure across a family of HQs, potentially allowing a superior to compare the maturity of HQs under their command. Whilst recognising the value of this approach, the study team felt it would have the significant drawbacks. A primary disadvantage would be to take away the flexibility of a HQ to tailor the HQMM to reflect its language, function and development needs: flexibility was valued as a way to improve the utility of the model, strengthen a sense of HQ ownership and enhance staff engagement with the assessment process.

A single HQMM could be developed by tailoring the generic model produced in this study. This has not been considered in any depth by the study team, but could provide the basis for a future study.

8.6 Evolution through Engagement

The process of active engagement to assist HQs with production of tailored a HQMM whilst developing the generic HQMM proved mutually beneficial. This form of Action Research allowed the study team to rapidly incorporate feedback from C2 practitioners with relatively little effort and generated a useful tool for HQ development.

9 Way forward

This research has produced tangible benefits for the HQs concerned, but it is considered that the work could be exploited further. For example:

- Rolling out the HQMM to other HQs, to further develop and validate the generic model.
- Revisiting the HQs previously engaged to gather further feedback on its practical use.
- Studying the development of a single, organisation-wide HQMM that could be applied to multiple HQs in a group.
- Discussions with other nations to share their experience with maturity models and, where appropriate, build a common model.

10 Conclusions

This paper describes the development of a generic HQMM, designed to support UK military HQs assess their ability to meet their operational roles. Based on feedback from HQs, the HQMM is considered fit for purpose as a template for HQs to develop maturity models tailored to their own needs, as part of their capability development process.

The work was undertaken with relatively little HQ engagement. Throughout, effort was made to minimise the impact or load on participating HQs. The *quid pro quo* of assisting the HQ staff in preparing their own maturity models while gathering feedback and lessons proved to be valuable, especially when combined with a rapid sprint approach.

The concept of a HQMM has been broadly welcomed and appreciated by those HQs we engaged during this study, and feedback has been positive. All of the HQs we worked with have exploited tailored versions of the HQMMs for continuous improvement purposes or are in the process of doing so.

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[4] See https://www.omg.org/spec/BPMM/1.0/About-BPMM
[5] NATO NEC C2 Maturity Model. See http://www.dodccrp.org/files/N2C2M2_web_optimized.pdf
[6] Joint Concept Note 2/17. See https://www.gov.uk/government/publications/future-of-command-and-control-jcn-217
[7] Patel, J. and Pattison, G., Headquarters Maturity Model: An approach to optimising a HQ for operational advantage, DSTL/WP099947/v1, 2017.