Engineering Support Transformation User Forum

Digital Twin Roadmap - Task Mandate

# Version Control

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| **Version Number** | **Description** | **Date** | **Comments** |
| 0.1 | Initial content creation for approval | 03 Aug 20 | Not endorsed for comment and approval |
| 0.2 | Additional content and minor edits following review | 06 Aug 20 | For ESTUF approval |
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# Governance

Under governance of the ESTUF

* Co-chairs:
  + MOD: Gary Cox
  + Industry: Alisdair Wood
* Task Group Lead: Darin Tudor
* TD Info Support: Steve Green

# Background and Requirements

A Digital Twin White Paper was produced and published in September 2019 which created and stimulated considerable interest in this topic within Defence.

To help mature and quantify this interest a series of 4 ‘Digital Twin Awareness Events’ were held on Teams during July 2020 which attracted 285 defence professionals to register initially then a total of 630 participants attended over the 4 days and on average due to the volume of questions and feedback each overran by 30 minutes.

The objective of these awareness sessions was to inform the audience 1/ what is a Digital Twin and 2/ what it could be used for in Defence (and its key benefits).

The key findings were.

* At no point did anyone have any objections or negative views to this not benefiting or being the right thing for defence
* Threats were identified if this is not done namely an increase in CAPEX and OPEX, UK PLC not being competitive on a world stage, a negative effect on availability and not keeping up with the fast-paced global technology roadmap.
* A Digital Twin as a key element of a Digital Backbone which will deliver enhanced deployed capability for Commands

It was agreed the next logical step was to identify the ‘How and When’ and the best way to achieve this was to create a ‘Digital Twin Roadmap’ and present the findings at a further awareness event probably in October/November 2020.

Aspiration

Produce a Joint MOD and Industry Digital Twin Roadmap

# Outcome

Provide an evidence-based call to action supporting the business case for a programme strand of DST EST to develop the MOD and Defence Support network to exploit the financial and efficiency benefits that digital twin technology offers:

* The Roadmap should provide an evidence base for DA4TQA to create a Digital Twin Programme BC
* The programme should inform any policy decisions that could be made about standards and identify adjacent standards/dependencies along with funded programmes (EP and Digital) that provide potential funded exploitation routes.
* It will also consider S&T R&D funding for alpha and beta POC/POV that will build the evidence base

# Roadmap

The Roadmap needs to lay out the activities that Industry and MOD need to do, the time scales and RoI info so that the DA4TQA can establish a funded programme as part of EST.

# Roadmap Task Group

A Roadmap Task Group should create this and build up the evidence pack to support MOD case for a Digital Twin implementation programme (understand, adopt, adapt, develop, implement and exploit)

The joint MOD and Team Defence Info badged ‘Digital Twin – Roadmap’ will describe:

1. Quick Recap ‘What a Digital Twin is’ referencing and links to previous White Papers on Digital Twins, Information Architecture Asset Management
2. Identify the key threats in not adopting it
3. The ways in which Digital Twins complement and ad value in the wider ‘Digital Backbone’ for Defence required by MOD seniors
4. ‘Map and Gap’ the ‘How’
   1. Stakeholders
   2. Steps
   3. Data - Sources/owners/collaboration
   4. IP
   5. Standards
   6. Regulation
   7. Integrate current MOD investigations (Hawk Accelerator, MOD T & E)
5. Make conclusions
6. Recommend way forward – Roadmap implementation specific examples. Recognising that a Digital Twin is more than just the technology the roadmap and accelerators will consider:
   1. Product – what will be twinned
   2. Process – how the twin is created, managed & maintained
   3. People – organisation, roles, responsibilities and SQEP
   4. Place – location where physical and virtual twin will be operated, created and visualised
   5. Platform – technology information systems and hardware to create the twin
   6. Partners- who needs to collaborate and be brought in to deliver the pilot
   7. Price – ROM cost for doing a pilot versus the potential benefits

# Task Group

A joint task group needs to be formed with contributing members who have the authority, experience and or access to this information to include:

* DA4TQA – MOD Support
* RAF – Platform/support requirements owner
* Royal Navy – Platform/support requirements owner
* Army – Platform/support requirements owner
* BAE Systems - Platform/support
* Rolls-Royce - Platform/support
* Babcock - Platform/support
* Regulator specialist (TBA) - For regulator requirements and buy in, particularly in air (MAA)
* Defence Innovation Cluster – Digital Twin White Paper Task Lead and access to industries that had already done this exercise
* Atkins – Digital Twin White Paper co-ordinator and access to other mature industry experience
* Open invite to the 285 attendees of the DT Awareness showcase to join workshops, provide case studies and review

# Task Duration

12-16 weeks, output to align with next session and input to EST OBC

# Communication

1. The outcomes will be presented at the next ESTUF
2. The Roadmap will be available for download from the TDInfo website
3. The Roadmap will be distributed by the ESTUF Co-chairs to a selected MOD and Industry target group
4. Provide the context and shape the next Digital Twin Awareness event

# Activities

1. Mobilise – establish team, set up work environment, agree tasks
2. Conduct discovery - across MOD and Industry, need to look outside of defence suggested key sectors, automotive, oil and gas, infrastructure, rail (who has the experience to evidence the journey, challenges, and benefits)
3. Assess the Currently state of play – cross sector analysis to baseline maturity of solutions, emerging practices, technologies and standards
4. Consider the options – opportunities, risks, exploitation of current activities, gap analysis, pros and cons
5. Map out the plan - identify recommended set of actions and put into a ROM costed plan including anticipated RoI
6. Write the report - populate strawman as task progresses this stage is about finalising
7. Peer review – by contributors
8. Communicate and distribute

# Ways of Working

* All information will be publicly available
* Content will be created collaborative
* Content is to be peer reviewed and agreed
* Regular touch point ‘Teams’ calls will be scheduled to assess progress and direct the work