How can the Government Service Design Manual be aligned to Defence Investment Approval requirements?

What Benefits does the Government Service Design Manual approach provide to Defence?

What attributes are required by MOD and Industry to succeed?

The Government Service Design Manual (SDM) provides the pan Government approach to develop and deliver digital services. Defence, across domains, can exploit the benefits of the approach by aligning it with the Investment Appraisal requirements to provide more responsive, agile and efficient services to the Front Line Commands.

This White Paper explores the use of an Agile methodology to deliver the Discovery, Alpha, Beta and Live phases as described in the SDM. It shows how the Agile outputs can generate the documentation needed to comply with the Investment Appraisal requirements and unique Defence challenges.
Part 1: Understanding the Challenge

Defence increasingly needs to acquire capability where the user need is continuously changing and the technology is rapidly evolving. The SDM introduced as part of the pan Government Digital by Default initiative provides a new approach to acquiring digital services. This white paper explores its viability for acquiring Defence systems and services.

Context

MOD has traditionally purchased large platform centric systems to address well understood and slowly evolving threats in the Maritime, Land, Air and Joint environments. The Digital environment presents new rapidly evolving threats and opportunities to these traditional environments that have the potential to seriously limit and potentially prevent the MOD’s ability to deliver its Military Tasks. The range, sophistication and source of these new threats continue to grow and morph to exploit vulnerabilities in technology and organisations. MOD and Industry will need to adapt its systems and business processes to sustain its operational advantage. It will increasingly need to exploit creative approaches through rapid and responsive contracting routes.

The acquisition of traditional defence-in-depth architecture no longer provides a viable solution and restricts the ability to fully utilise emerging technologies and techniques. The implementation of the business as usual acquisition processes to satisfy the Investment Approval requirements reduces further the ability to rapidly respond to these new threats. These processes are usually delivered in a technically inflexible and programmatically slow way due to the large numbers of stakeholders, long manufacture lead times and the need to fully define the User and System Requirements prior to the release of programme funding for manufacturing. Over the years many programmes have attempted to address these difficulties by applying evolutionary or incremental acquisition lifecycles with varying success. These include enduring Concept Phases, short increments and approved but unallocated funding models. These examples demonstrate that there is an appetite to try new approaches and the flexibility within the investment approval processes to govern alternative approaches.

Modern ICT systems have lifecycles that can be orders of magnitude shorter than major military platforms and as a consequence require a more responsive and agile approach to acquisition. A more responsive and agile approach to acquisition will ensure the benefits of emerging technologies can be realised by Defence before their benefits become obsolete or their rapid adoption by our adversaries outflank our capabilities. Such an

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1 Enterprise Defensive Cyber Whitepaper
2 DE&S Acquisition System Guidance
3 JSP507 Investment Appraisals & Evaluation
4 JSP655 Defence Investment Approvals
Approach moves towards continuous service provision and away from product lifecycles.

The UK government has recognised the need to improve the acquisition of digital services and published the UK Government Digital Strategy in 2013. The Digital by Default Service Standard and the SDM flowed out of the strategy. The SDM describes a five stage approach to the development of digital services based around increasing user understanding via solution prototyping. The approach exploits the attributes of the Agile project management methodology.

This white paper assesses how the SDM approach can be used to acquire Defence Capability whilst aligning with the ‘as is’ Defence Investment Approval requirements. The paper highlights benefits of a SDM approach and some of the areas still presenting significant challenges. Government acquisition of digital services

The UK Government Digital Strategy aims to improve the delivery of digital services via a fundamental change in delivery approach. The SDM describes a five phase (Discovery, Alpha, Beta, Live, and Retirement) approach for end to end service design and delivery focusing on gaining understanding of the user need throughout the development and delivery of the solution. The approach centres on designing and testing the service in small chunks through a series of short increments (often termed Sprints) and solution prototypes. The approach significantly reduces the requirement capture phase by continuously engaging the user and allows early capability realisation via solution releases. Figure 1 shows the SDM approach with increasing solution maturity over time.

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**Figure 1 Service Design Manual approach describing how the team and major artefacts evolve through the phases whilst continuously releasing benefits**

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7 Discovery, Alpha, Beta, Live, Retirement
The approach is delivered using an Agile methodology via small empowered self-organising teams. The teams address the items captured in the Product Backlog which are identified via User Stories, and addressed in increments via a series of Sprints. Whilst Agile is a project methodology it is often considered a culture as much as an approach. Project team culture is far more important in an Agile rather than waterfall delivery model. This white paper uses the Scrum approach to deliver the Agile methodology. Scrum is a widely used and well documented instantiation of Agile.

Challenges of using a new Approach

In order to realise the benefits, Defence needs to overcome some challenges. These are:

1. **Alignment of SDM outputs to support Investment Appraisal Board review points;** The delivery of digital services requires rapid and responsive acquisition processes which can procure systems whose final architecture and usage contains uncertainty. The Investment Appraisal Initial Gate (IG) and Main Gate (MG) Business Case (BC) approvals require complete and endorsed definition of the User Requirements (IG) and solution (MG). The acquisition can be against an evolutionary or incremental approach but these still require a description of the User Need to be frozen. In a digital services context the User Need is always evolving and requires approval to develop solution increments without a fully defined User Need. The focus for approval shifts more towards delivering features rather than having a complete understanding;

2. **Defining an evolving User Need;** The traditional MOD approach fully defines the User Need before releasing funds to develop, de-risk and deliver the solution. The User Need is defined in a User Requirement Document (URD) that is endorsed by the End User (Front Line Commands). The SDM approach spends its entire life refining its understanding of the User Need and reprioritising the items contained in the Product Backlog. The evolving User understanding presents the biggest challenge when attempting to produce a single endorsed URD for an IG BC. The ability to dynamically change Investment Appraisal artefacts whilst staying inside the authorised scope and following an Agile approach will require careful thought through processes and tool configuration;

3. **Frequent Reprioritisation of Solution development;** The URD and System Requirement Document (SRD) set priorities which are used to aid decision making when conducting capability trade-offs as part of a Combined Operational Effectiveness and Investment Appraisal. The prioritisation happens once to decide what should or should not be acquired rather than deciding the order in which the requirements are addressed. The SDM approach prioritises the order in which the solution is developed based on the prioritisation contained within Product Backlog by the Product Owner who represents the needs of the User. This allows new priorities to be added but does not provide a guarantee that all the SRs presented at the MG BC will be
addressed. This allows the most important aspects to be addressed first and for new priorities to “jump the queue”. This approach provides solution responsiveness but does not guarantee all system requirements presented at the MG BC will be addressed;

4. **Acceptance and Accreditation of small increments**: Acceptance of a solution that supports a future, as yet undiscovered need provides a significant challenge. This will require assurance and trust to be built between the supplier and customer during the delivery of each increment. The regular release of capability to the user at a Beta and Live maturity make the acceptance of system wide non-functional requirements especially challenging. These include compliance against safety and security legislation as well as system wide performance budgets such as size, weight, power and storage. The need to potentially re-accredit the solution at each release presents a significant challenge.

These Challenges raise the following questions:

- Can an SDM approach be taken to requirements definition, solution development and acceptance whilst maintaining compliance with the Investment Approval requirements?
- Can existing approaches be used to fund the development of solution architectures to address unspecified future User Need?
- How can we accredit a system that is continuously evolving?
- How can we accept a service that is continuously evolving to address an ever changing User Need?
- What cultural changes are required of Defence and Industry to deliver via a SDM approach?

**Challenges:**

- Alignment to Investment Approval review gates.
- Defining an evolving User Need.
- Reprioritising solution development within authorised scope.
- Accepting and accrediting frequent small capability releases.
Benefits of overcoming the Challenges:

By overcoming these challenges Defence can realise a series of Operational and Business benefits. These benefits are described below with the remainder of the white paper presenting an approach to enable the realisation by Defence. The benefits are:

- **More responsive to emerging threats**: By testing the understanding of the User Need via solution prototyping it is possible to roll out capability enhancements via solution increments before the User Need is completely developed. The concept of delivering solution increments as soon as they are available lays at the heart of SDM. Explicitly this is achieved by:
  - More responsive development of solution increments to address emerging threats in shorter timescales;
  - Increased ability to counter emerging threats (reduce the risk likelihood of a successful attack) by exploiting advances in technology whilst they are still novel and not when it is already out of date. This is achieved by reprioritising solution development to incorporate new technology;
  - Stakeholders can influence design throughout the programme lifecycle saving significant retrospective redesign to decrease the time taken to respond to changing project emphasis.

- **Improved project efficiency**: By selecting an appropriate project and having the correct project team culture the following project efficiencies can be achieved by:
  - Exploiting wider industry best practice on the use of Agile allowing Defence to benefit from SQEP generated in non-Defence markets;
  - Incremental delivery of the capability reduces the likelihood of the project being cancelled before any capability is realised;
  - Prototype new concepts in a near operational environment to reduce uncertainty when deploying onto live systems removing downstream development risks and delays;
  - More candid engagement from stakeholders when they know that they have more than one chance to deliver the right capability. They are not paralysed by the fear that they will get it wrong;
  - Incrementally accept the solution removing the need for large and cumbersome acceptance and accreditation phases.

- **Better balance of Risk and Opportunity**: Be more flexible in the ability to balance the opportunity of rapidly deploying new technology against the risk of incomplete understanding.

Part 2: Delivering Digital Services using the Service Design Manual approach in the context of Investment Appraisal rules is available upon request.

Please contact services@bmtdsl.co.uk to request access to the full paper.