

Interfacing Systems Engineering



The delivery of military capability has become increasingly dependant upon the seamless interaction of a large number of complex systems. The opportunity for a single project to exist in isolation is limited and the vast majority will have a significant number of external interactions. It is important to understand the nature of these interactions which may take many forms such as physical and programmatic as well as information interchange. The influence that the interactions exert upon the shaping of a particular equipment solution must be fully understood, so that mechanisms can be put in place during the project life cycle to facilitate suitable exchanges of relevant information. Interfacing Programmes and Systems (IP&S) are key stakeholders in any project and constraints they impose upon the equipment solution must be considered from the outset.

Overview

By adopting a pro-active approach to the management of IP&S, a project will avoid many of the pitfalls of normal procurement such as

- Delivery of a stove-piped solution
- Failing to deliver 'More Effectively Integrated'
- Missed opportunities relating to savings in cost, time and the leverage of capability off other systems

In contrast to the pitfalls, the benefits of greater integration and alignment can be realised across a number of areas

- Identification of gaps or overlaps in capability
- Programmatic impact analysis – an aid to informed decision making
- Generation of intelligent, coherent URDs and SRDs
- Risk impact and Issues visibility
- More effective and focussed project management
- A truly integrated Through Life approach

The Sula Methodology

The Sula Systems methodology ensures a thorough understanding of the complex interactions across the system boundary. The benefits of this process have been recognised by leading defence contractors and Government project managers alike.



The process has an inherent flexibility that allows it to be adapted to meet the most complex situation, and to evolve as a project passes through the various life cycle phases. Initially developed with the Equipment 'line of development' in mind, the Sula Systems' approach has wider utility across all lines of development and throughout the CADMID cycle.

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The Sula Process

Identify

The process is initiated with an identification of the likely interfaces to a system; this can be achieved through analysis of requirements documents, use cases and through the application of subject matter expertise.

Prioritise

The degree of constraint that the IP&S exerts is then determined and a categorised list is produced. Categories adopted are as follows:

- **Cat 1 – IP&S will have a significant impact upon the system**
- **Cat 2 – IP&S will have some impact upon the solution**
- **Cat 3 – IP&S will have a negligible impact upon the system**

Capture

A data gathering element involving interaction with IP&S to determine the exact nature of interaction in the 4 main interface areas:

- **Physical – Size, weight, power mechanical, environmental etc.**
- **Information interchange – Comms C2, Situational Awareness etc**
- **Programmatic – Programme timelines, key decision points and information needs**
- **Other lines of development – Training, Doctrine etc.**

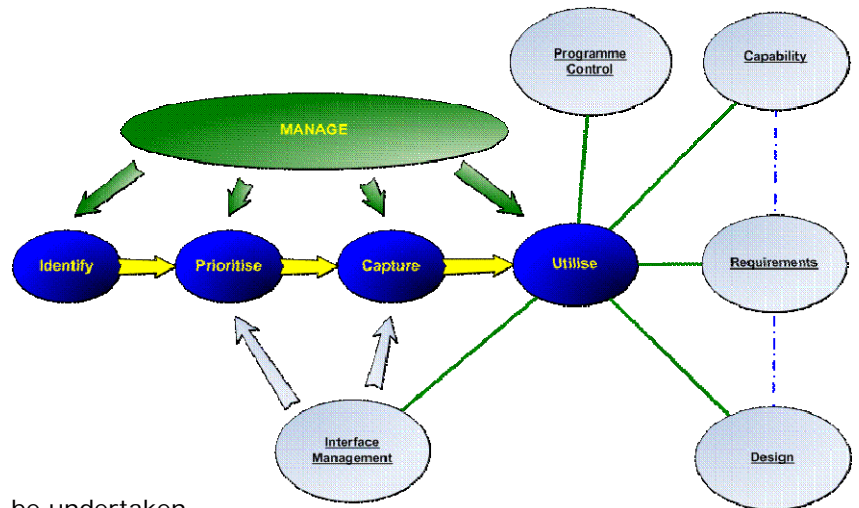
Risk and cost issues are also captured at this time, and all of the information obtained is stored within an easily accessible data structure.

Utilise

Collected information must then be used to add value to the process. This is achieved in 5 key areas.

Capability

Assessment of the contribution made by IP&S to the delivery of the required capability enables the system boundary to be properly defined and a gap analysis to



be undertaken.

Requirements

Closely linked to capability, the requirements documents can be influenced by the needs of IP&S to ensure a coherent set across projects. Similarly the needs of the system can also be used to influence the IP&S requirement.

Design

Naturally the requirements will flow down into the design stage, but other information relating to IP&S will also be used to ensure compatibility.

Programme Control

Information relating to the programmatic interaction, such as decision points and reviews can be used to maintain a proper focus and ensure greater cohesion between projects.

Interface management

Close, continuous links ensure that decisions and their impacts can be assessed at the earliest opportunity.

Management

The overall process is then managed to ensure focus is given, wide stakeholder buy-in is obtained and visibility of the key issues and risks is maintained.



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