

SSEI Research Task Summary – T1

Task Number: SSEI/T1
Project Title : IMS for Adaptive Systems
Research Theme : *Software Systems Architectures*

Lead Delivery Organisation : SEIC

Version : 3



Objective of Work (why are we doing it ?)

Modern military systems are using Integrated Modular Systems (IMS) to reduce life-cycle costs and to ease upgrades. These systems need to be increasingly adaptive, e.g. to respond in real-time to changing operating environments, including recovery from failure, and to provide autonomy. Thus more adaptive IMS technology is needed in order to meet future military requirements. This applies both to individual platforms, in all military domains, and to the development of Network Enabled Capability (NEC).

The objective of the task is thus to investigate and demonstrate techniques for extending the current IMS approach with a view to increasing adaptive behaviour whilst maintaining dependability.

Nature of Work (what is it?)

The task will build on previous MOD-funded Avionics Systems Standardisation Committee (ASAAC) work and industry-funded research into IMS software concepts for military embedded systems. IMS is the software architectures already used on Tornado and Hawk and proposed for Typhoon and Wildcat. The task will aim to extend the current IMS capability in two directions:

- Application of IMS to more adaptive systems, in particular to support future system operations in more dynamic operating environments.
- Application of IMS to platforms in non-air systems domains, in particular to land-based vehicles.

Other modular software architectures, including civil standards, will be reviewed and the portability of applications between architecture types considered

Outcomes (what will it produce/has it produced ?)

- Report on state of the art in adaptive software architectures for dependable real-time systems.
- Report and demonstration on application of IMS to non-air systems applications, including lessons learned and future IMS research directions (that should provide benefits to future development of IMS for a range of military applications).
- Report and demonstration on application of (non-IMS) modular software architecture approaches to dependable real-time systems.
- Report and demonstration on IMS for future adaptive systems

Timescales 36 month tasks, April 2008 to March 2011

Partners BAE Systems

Related Work SSEI/T4

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