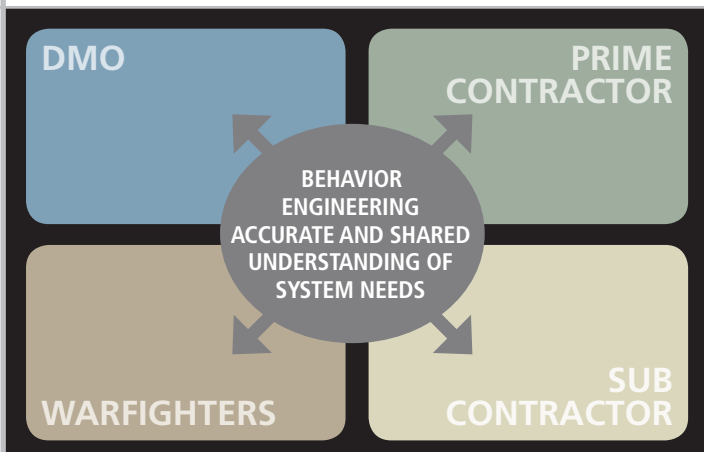


Understanding grows on Behavior Trees



Raytheon Australia is providing financial support and partnering for world leading research by Griffith University to develop Behavior Engineering, a method for eliminating cost blow-outs and schedule overruns in large scale, high risk engineering projects.

Raytheon Australia is continuously evaluating and implementing methods of ensuring projects are delivered to the Department of Defence at an agreed level of maturity. Behavior Engineering has the potential to deliver important benefits to Raytheon Australia, to the Defence Sector and other sectors of the economy that involve large-scale integrated systems.

Modern engineering projects often consist of thousands of separate pieces of information which describe how a system or situation works. The amount of detail and sheer volume of information, particularly with high risk projects, is far too large for the human memory to digest. This prevents anyone from gaining a deep, accurate and holistic understanding of how a system or situation works, potentially leading to costly delays or failures.

Our natural language also contains ambiguities and inconsistencies which further inhibit a complete understanding of the whole process and has an adverse impact on the development of the solution.

Professor Geoff Dromey and his team at the Australian Research Council Centre for Complex Systems at Griffith University have developed Behavior Engineering, a method of distilling large amounts of detail into bite-sized chunks.

How Behavior Engineering works

In Behavior Engineering, system requirements are analysed to develop a Behavior and Composition Tree representation of the system.

The Behavior Tree is made up of small fragments of Behavior that are unambiguous and rigorously translated from the requirements to describe each part of a complex system, like a jig-saw puzzle piece. The Composition Tree contains the different components of the system and their hierarchical relationship.

The pieces are then put into their proper place to give a complete tree-like picture, showing the integrated Behavior of the system, and making it easier to comprehend. This also identifies defects in the system — pieces which are missing or do not fit.

For more information on Behavior Engineering, visit http://en.wikipedia.org/wiki/Behavior_Trees

Bringing Research to reality

Raytheon Australia is proud to be a partner with Professor Dromey and his team, and is providing funding and collaboration to bring this research to reality.

In 2007, the company, led by Chief Technology Officer, Dr Terry Stevenson, and Project Manager, Jim Boston, worked with Dr Dan Powell from Griffith University, employing Behavior Engineering to analyse six large scale, nationally critical projects for the Australian Defence Force. It immediately uncovered a number of major issues with the systems, at a significant saving in cost and time compared to conventional processes.

Raytheon now wants to see this method further developed in areas of critical interest to the company and the Defence Industry.

This research is fundamental to the ongoing development of robust and dependable solutions for Defence and industry in general. It has the potential to further promote Australia as a leader in both Systems Engineering and Engineering development from requirements through to solution. As the result of this collaboration, Raytheon Australia received the award for Best Industry Experience Report at the 19th Annual Software Engineering Conference (2008).

Professor Dromey was recognised in the inaugural Australia Research Council (ARC) Outcomes forum in June 2008 which celebrates real-world outcomes from world class research as judged by ARC peers.

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