



## **Systems Engineering for Small and Medium Enterprises**

*A 2-Day Practical Workshop*

### ***Better Product Design for Better Profitability.***

Systems engineering was developed as a way of thinking about large, complex system development. It is often viewed as an overly rigorous, documentation-based discipline. What can it possibly offer to an efficient, product-oriented enterprise?

The answer lies in an understanding of what systems engineering really is: a set of thought processes that guide how to think about product development. When used on large government projects, systems engineering leads to extensive documentation. When the same thought processes are used for small product development, however, they result in effective risk-based engineering that works.



Small and medium enterprises (SMEs) today are producing products that are far more capable than ever before. Those products often fit into larger systems with difficult, complex interactions that impact the product design. (The picture shows a dynamic control product for home heating and air conditioning that operates through the Internet.) The most profitable SMEs are drawing the most efficient ideas from the systems engineering methods long used by larger enterprises.

This workshop provides you with a summary of the most efficient methods used by systems engineering, methods that work at the level of SMEs, methods that you can apply now.

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#### ***You should attend this workshop if you are:***

- Developing products in an environment that demands the most efficient methods.
- Project leader or key member in a product development team
- Developing products that must fit into and work with larger systems.
- Looking for practical methods to use today

#### ***The course is aimed at***

- SME engineering principals,
- Project leaders,
- Technical team leaders,
- Design engineers, and
- Others who participate in defining and developing complex systems.

***Apply the ideas during the workshop to your own challenges.***

Workshop groups identify their own challenges and then work together to identify which of the taught methods will help make their development better.

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### ***Topics Covered in the Course***

**Why Systems Engineering?** – (1 hour) Real examples that show the efficiency obtained with systems engineering. Quantified results that indicate the Return on Investment (ROI). Examples are drawn from reported projects as revealed by recent research.

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**Systems Engineering Model** – (1/2 hour) An underlying process model that ties together all the concepts and methods. Overview of the systems engineering model; technical aspects of systems engineering; management aspects of systems engineering.

**Defining the Need** – (2 hours) Working with stakeholders and customer groups to define the need for the product. Selecting market groups for effective work. Functional Flow Block Diagrams. Use Case and Activity diagrams. Quantifying the preferences of the stakeholders

**Using Requirements** – (2 hours) Requirements as the primary method of measurement and control for product development. Requirements management and requirements databases – how to use them instead of having them use you. Dynamic requirements, and keeping them from killing development.

**Architecting a Solution** – (2 hours) How to foster engineering creativity. Architecting heuristics as they apply to products, to product lines, and to components of a system. Applying the quantified need in trade-offs. Documenting architectures to communicate with both the team and the stakeholders. Using architectural models to test the market.

**Designing Product Quality** – (2 hours) Ongoing methods to check the product development. System quality metrics based on the quantified need, and using them to predict product ROI. Technical performance measures. Efficient risk management.

**Case Study** – (4 hours) Study of real product development challenges to consider how to use systems engineering. Based on projects selected by the participants from their own work. Include four 1-hour segments of work practicing the four major topics above.

**Summary** – (1/2 hour) Review of the important points of the workshop. Course evaluation.

***The Presenter:***

**Mr. Honour** has been in international leadership of the engineering of systems for a dozen years, part of a 37-year career of complex systems development and operation. His energetic and informative presentation style actively involves class participants. He was the founding Chair of the INCOSE (International Council on Systems Engineering) Technical Board in 1994, was elected to INCOSE President for 1997, and served as Director of the Systems Engineering Center of Excellence (SECOE). He was selected in 2000 for Who's Who in Science and Technology and in 2004 as an INCOSE Founder. He is on the editorial board for *Systems Engineering*. He has been a systems engineer, engineering manager, and program manager at Harris Information Systems, E-Systems Melpar, and Singer Link, preceded by nine years as a US Naval Officer flying P-3 aircraft. He has led or contributed to the development of 17 major systems, including the Air Combat Maneuvering Instrumentation systems, the Battle Group Passive Horizon Extension System, the National Crime Information Center 2000, and the DDC1200 Digital Zone Control system for heating and air conditioning. Mr. Honour now heads Honourcode, Inc., a consulting firm offering effective methods in the development of system products. Mr. Honour has a BSSE (Systems Engineering) from the US Naval Academy, MSEE from the Naval Postgraduate School, and is a doctoral candidate at the University of South Australia.

