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Book Review: Relationships Made Easy. How to get on with the people you need to get on with... and stay friends with everyone else.
During a recent workshop I attended, we discussed a number of examples that would demonstrate the case for thinking “Systems”. One of the examples was the issue of the introduction of electric vehicles into the UK transport system. Should the current initiatives and developments be successful and the technology mature enough to be an affordable alternative to our current dependence on fossil fuel powered vehicles, then these vehicles will become very popular. However, it is not currently apparent that anyone is thinking about the changes required to the UK infrastructure to enable this change. For example, how will existing refuelling services be replaced by electrical replenishment? Given the current issues associated with the UK's ageing electricity generation being able to meet the future demand, how will it cope if rapidly we all need to plug our cars in at night or during the day?

This is not the only example from the development of sustainable/environmental initiatives. For example, whilst visiting my In-Laws in Welshpool last Easter (2009), there was a local campaign against the development of a large scale wind farm. Some of the issues being discussed were related to the environmental and social impact of the construction of the wind farm itself. The construction would require parts to be delivered on lorries so large that most of the roundabouts would have to be removed to enable them to pass. Residents were being advised to have structural surveys done on their properties that were close to the route to assess any damage caused. Whilst some of this was probably propaganda and scaremongering, it did make me think that all this should be taken into account when planning such a project. For example, would it be better to do more assembly on site to reduce the size of the incoming shipments? I hoped that someone had assessed the evidence, done the sums and the trades to ensure that the cost benefit of such a wind farm was in the environmental, economic and social interest.

This “whole systems” view of sustainability is the subject of a session being organised by INCOSE UK at the forthcoming IEEE Annual System of Systems (SoS) Engineering Conference in June being hosted by Loughborough University.

INCOSE UK has organised an industry-led panel session that will provide a through life perspective on SoS Sustainability problems. The speakers will draw upon practical examples of the application of SoS Engineering to the whole lifecycle of products and services, including their contribution to fulfilling the higher level capabilities of the stakeholders, and considering the end-to-end set of activities that must be taken into account when delivering these solutions.

Whilst on the subject of events, there have been a number of one-day events provided by or supported by INCOSE UK. These include the Royal Aeronautical Society Weapon System Integrity vs Interoperability Conference at Boscombe Down where Hillary Sillito kindly chaired the afternoon session, the Bristol Local Group's Simple Techniques That Work workshop and the Rail Interest Group’s Systems Engineering and the UK Transport System event. My thanks go to all involved who put a lot of hard work into making these events a success.

Finally, with the General Election looming on the horizon it reminds me that INCOSE UK will also be holding elections in September. This year the Council posts of President Elect, Finance Director and Technical Director are up for election. This is a reminder for members to consider whether they would like to get involved with the leadership of INCOSE UK. Anyone interested in standing for any of these posts and would like to find out more information about what each role involves and how the nomination and election process works should contact a member of the Council (contact details are available on the INCOSE UK website www.incoseonline.org.uk).

### AA09: Session Reports

The presentation material used in the Conference Theatre sessions at the Autumn Assembly 2009 is available at the INCOSE UK website www.incoseonline.org.uk to those who attended. The following are summaries of each session.

#### Reviewing System Concepts against the challenges of a Systems World

**John Davis** and **Theo Tryfonas** (Systems Centre of the University of Bristol) presented their perspective on critical constructs and ideas of systems thinking. They discussed the development of a number of ideas such as interaction, feedback, hierarchies, holons, amongst others, that emerged from a mosaic of disciplines to form a coherent whole in the form of an outlook, what we call today systems thinking.

They expressed the idea that systems thinking is a skill that is shared with many disciplines and that by applying it to engineering problems and designs we provide the basis for holistic collaboration.

They emphasised what they view as key strength of this way of thinking: the ability to provide a better understanding of the interactions between the hard (physical, product, defined processes, ...) and the soft (people, social dynamics and change, human-machine interactions, ...) parts and their seamless integration. Integration that is only achievable through people, purpose and process in the context of performance, as no engineering system can be viewed in isolation of its social context. In order to achieve that, a combination of approaches should be used that may include technological as well as social research elements and a higher level of interaction between stakeholders.

**Sarah Sheard** (Third Millennium Systems) considered “Complex Systems” as a field born from chaos science and complexity, as a result of studying commonalities among many different fields, from ecology to neuroscience. Systems Engineering is beginning to incorporate wisdom from complex systems theory, just as it has over the decades incorporated general systems theory, systems thinking,
The cross-chamber conversations illustrated that Model-Based Systems Engineering (MBSE) provided a rich environment in which to represent the system of interest. There was a need however to:

- Recognise that the definition of the system boundary was a key component to understanding (it was not possible nor useful or practical to attempt to model the universe, but enough had to be represented in order to be useful);
- Recognise that no one technique surmounted all the issues and problems (each had limitations and restrictions and as such recognise the limitations of models; they are an approximation of the real world (“all models are wrong, but some may be useful”), but each has some utility in resolving the issues to hand;
- Understand that there are advocates for each approach from which to gain support and insight, but that an appropriate language was essential to promote coherence and understanding;
- Appreciate that tool support for the techniques was always developing and that the apparent limitations of the techniques were being overcome and improved as they evolved.

It was clearly highlighted that there is no single source or panacea for the management of complex problems or the design/use of architectures within such a field. Equally clearly however was that there exists a wealth of knowledge, experience and support to a wide range of methods, tools and techniques that will enable the systems engineer to achieve a firm grip of the problem and establish appropriate solutions.

Charles enabled a fascinating discussion and insight into the topics of MBSE. He prompted and promoted a lively debate about the various styles and ‘churches’ of MBSE and even hinted at his own research in this domain and the ability to provide a mathematical formalism between requirements and design through models and transformations. He provided much food for thought and insight into this growing element of the discipline.

**Life-cycles – are our life-cycle approaches up to current and future needs?**

This session was led by Rick Adcock (Cranfield University) and Andrew Farncombe (John Boardman Associates Ltd).

It started with a reminder of why life-cycles are important in Systems Engineering and reflected that as it had been some time since this topic had received an airing, perhaps one was overdue.

It then went on to put the much maligned Waterfall Model into its proper context as being necessary but not sufficient for life-cycle thinking. If you think of the Waterfall Model as a set of necessary Systems Engineering activities, you can ‘wrap’ these up into different true life-cycles (e.g. CADMID, Evolutionary, Incremental, etc), which you select according to the dictates of your project circumstances. No one life-cycle has an absolute claim on being correct in all circumstances, and horses for courses thinking should prevail. Consequently, adopting an organisational rigidity that insists on applying one life-cycle in all cases is a ‘bad thing’.
Given this, the session went on to think about guidelines for selecting the most appropriate life-cycle for a given situation and explore possible ways of combining the main ones to provide additional flexibility.

A good discussion period followed with these as the main points arising:

- Drivers for selecting a particular life-cycle should not be understood as being predominantly technically-motivated. In many (indeed all?) domains, business and marketing considerations will have an important influence.
- Model-driven approaches that employ code-generation techniques, with System Engineers specifying the code (thought to be a bad thing, by the way!), may affect the life-cycle. This could lead to a ‘you can cut out some of the life-cycle stages if you employ model-driven SE, and thus get stuff out of the door more quickly’ attitude.
- Following on from this, throwing out life-cycle stages (and throwing out life-cycle thinking) will have an impact on how progressive assurance is done (or not!).
- To avoid this kind of throwing-out-the-baby-with-the-bathwater, a life-cycle tuned for MBSE might be desirable.
- Life-cycle thinking should be connected to other areas such as: MBSE, the Architectures Working Group, the In-Service Systems Working Group, Small/Medium Enterprises (SMEs), ie is there a case for SME-specific life-cycles ?

**SE for the smaller organisation: a question of scale or a different approach?**

This session explored the motivation of Small/Medium Enterprises (SMEs) to use Systems Engineering and what the Systems Engineering community could do to help make Systems Engineering more accessible to SMEs. The session consisted of presentations from Dr Doug Cowper (Cleave Systems Ltd), Ian Gibson (Sula Systems Ltd) and Professor Alan Smith (UCL).

In a time honoured Systems Engineering manner, each of the Presenters, first bounded the problem space. We learnt that the EU considers an SME to be an organisation of less than 250 employees. Presenters, first bounded the problem space. We learnt that the EU considers an SME to be an organisation of less than 250 employees. The presentation included questions directly related to the presentations, more general questions on the meaning of Capability and views from the floor.

After the presentations, there followed a good debate on "What could be done to make Systems Engineering more accessible to SMEs?". It was generally felt that SMEs would benefit from a guide on:

- Systems Engineering principles,
- Tailoring System Engineering processes to address the specific needs of SMEs.

Finally, the question was raised as to what INCOSE should do next. Should INCOSE form a working group to consider producing a guide for SMEs or should it do something else? Please send your views on a postcard to Doug Cowper!

**Unlocking the value of Enterprise Architecture**

This session was given by Nick Rhodes and Anthony Gollodge of Detica UK.

Enterprise Architecture (EA) has enjoyed strong growth and senior support in many organisations over the past twenty years as a tool for helping businesses understand the way they work. So why, as businesses come to terms with operating in a recession, is Gartner warning that many EA programmes will stop, and many others will have their funding cut? The talk aimed to review the history and state of EA today, explore the value it offers to businesses in today’s climates, and offer some practical insights to INCOSE delegates on how to adopt EA principles in their work. With a brief to be ‘provocative’, Nick and Anthony challenged the purpose of developing elaborate EA models which don’t help businesses deal with their most pressing issues such as which programmes to invest in, or what balance of people, process and technology change will best achieve their objectives. Their deliberately ‘glass half-full, glass half-empty’ approach meant that they left the audience to decide on whether the benefits case stacked up. The challenging nature of the questions suggested that for a number of people in the audience, the EA glass is indeed half empty – or in the case of the defence sector is answering a different question, where EA is a given, but the enterprise challenge is about data acquisition rather than modelling.

**Understanding Capability – Concepts and Application**

The main presentations in the session were provided by Professor Mike Henshaw (Loughborough) and Professor Alex Duffy (Strathclyde). Peter Lister (Harmonic Ltd) introduced the session and rounded off the presentations with an overview of the recent Capability Working Group meeting.

Mike Henshaw presented ‘Some Thoughts on Capability’ which began by exploring several definitions from manufacturing and defence. A simple river crossing problem served to illustrate the choices that face the capability provider, and the way that changing the environment or threats leads to a re-evaluation of the potential solutions. A conceptual model of TLCM (Through Life Capability Management) was presented and a concept for measuring capability. The final conclusion was that there is more to Capability than systems.

Alex Duffy presented ‘A Design View of Networked Capability‘ which explored different definitions of Capability, military, industrial, and design. Relating the first two to a design view Alex suggested that they represent particular views of a complete model. This asserts that capability is an intrinsic quality or property of a resource (people, hardware, software, information, procedure etc.), that is revealed by the resource’s behaviour. Capability is can be measured by the performance of the behaviour.

A lively question and answer session completed the session which included questions directly related to the presentations, more general questions about Capability and views from the floor.
Resilient, Dependable Systems-of-Systems

The main thrust of Andy German’s and Glen Wilkinson’s presentation was that Battlefield accidents are not specifically owned at a platform or system level. Therefore accidents such as ‘fratricide’ or ‘unintentional entry into a hostile zone’ should be investigated and mitigations developed at the level of the System-of-Systems (SoS). It was contended that Battlefield SoS safety could be investigated and mitigations identified using an accident directed methodology. Using an understanding of these SoS accidents from historic accident investigations, these can be modelled, using super sets if necessary, to identify information flows to allow techniques such as HAZOP to be used and key decision points involving liveware (humans) to be investigated.

At the end of the session the example accidents were discussed and in particular those involving Coalition fratricide. It was suggested that the ‘loss of situational understanding’ could be seen as a lack of investment in combined Coalition training instead of SoS technical and battlefield management failures.

There was a discussion regarding whether these really can be regarded as SoS or whether they are just disparate systems that come together at the point of the accident to contribute to the accidents likelihood, eg they are designed in isolation and are not considered to be an integrated SoS. It was unclear how many people agreed with this as it seemed to form into the definition of a SoS whether or not it’s derived from a set of formal requirements for a SoS. However, the most useful comment was that system ownership within the UK MOD and Coalition forces was at a lower level than the suggested ‘system’ level and therefore the use of ‘SoS’ was appropriate. Additionally, it was recognised that there is a period of time when a SoS is forming that it is not a complete SoS but is still being relied upon to provide safety related data. It was recognised that this provided a risk as a complete picture of Situational Understanding was not available to the Human until the SoS was complete, thus the decisions they make may be based upon an incomplete data set.

Using Progressive Assurance to gain confidence in the Properties of Complex Systems

The session was chaired by Roger Short who kindly stepped in when Ivan Lucic was diverted by work commitments.

The first presentation, by Amer Saeed, focussed on progressive assurance in infrastructure and construction projects, and discussed the value of progressive assurance in the Heathrow Terminal 5 project. Amer noted that progressive assurance was a particular benefit in projects that are complex; of a long duration; and made up of smaller, autonomous projects. He discussed the value of the approach in a number of areas, including defect resolution, closure of assumptions, reporting and monitoring the effectiveness of processes. Amer also considered the role of assurance and its place in the centre of a number of competing areas of interest, and warned of the dangers of ‘reporting drift’ where the assurance function is pulled too far away from its central position amongst those interests. It was emphasised that a successful assurance programme must be agreed to by all stakeholders, and must use common measures of risk.

Questions focussed on the topics of defect resolution, and in particular the saving of £3m by the early identification of a high number of defects early in the process, and also the use of the approach in closing out assumptions arising in part from the structure of the project, where so many boundaries existed between the smaller projects that made up the T5 delivery project.

The second presentation, by John Pearce, considered the example of progressive dependability assurance within the defence sector. The presentation was made in the context of a sector that was moving away from traditional reliability and maintainability approaches towards the production of a dependability case, where the main risks are considered in terms of loss of service and support costs. The presentation considered the lifecycle and structure of a dependability argument, and provided examples of the evidence used in particular MOD projects. John concluded the discussion by considering the benefits that the dependability assurance approach achieved, but also warned of the risks of misuse of the approach.

Questions focussed on the benefits of the dependability approach and the evidence framework.

The third presentation, by Roger Short, provided a thought-provoking discussion on the way in which understanding is helped (or sometimes hampered) by the documentation that supports a system. The analysis undertaken by Roger considered the concept of complexity in documents, and provided a means of assessing the mental work required to understand complex information. By developing a metric for the cognitive complexity of the documents from which safety assurance has to be generated it may be possible to evaluate the level of confidence in the safety of a system that can be produced by the application of a given amount of effort. The presentation provided a reminder that a significant cause of failure is incorrect understanding, and making documents understandable is important for the avoidance of failure.

Questions focussed on possibility of extending the research to consider other factors in complexity, and the application of the approach to a wider context of understanding.

The fourth presentation, by Peter Stanley and Zoë Alderman, considered two views of the challenges associated with developing safety cases for complex programmes; the first view provided by the end user, and the second by a supplier into the project. Peter provided a view of the delivery strategy on the Victoria Line Upgrade Project, and discussed the complex nature of the delivery of a series of interconnected upgrades from a variety of supply chains. He also illustrated the complex nature of the assurance regime on the project. Zoë considered the assurance process from a lessons learned perspective and identified key areas where negotiation and agreement at an early stage of the project could reduce risk of delays and rework. Both Peter and Zoë concluded that in a long and complex supply chain, it was essential to take a “one team” approach to the engineering of a project.
An INCOSE UK One Day Event took place in Bristol on 3rd March 2010, the event was organised by the Bristol Local Group and was titled “Simple Systems Techniques That Work”. The event challenged delegates to use simple systems techniques to address the problem of how to save the earth from meteor attack.

The Organisers’ perspective

Reviewing the issues and topics covered at INCOSE events - international, national and in the Bristol Local Group meetings, the BLG committee thought that there was a lot of detail and complexity - e.g. focus on detailed requirements writing, Systems Modelling and architecture, and that there was a danger of a lack of focus on the essential purpose of Systems Engineering which is to simplify and understand the complexity. We feared that we might be creating a barrier to entry to Systems Thinking to new or potential Systems Engineers. So we conceived of an event that would take us “back to basics” focus on “simple techniques that work” (in a reference to the Royal Academy of Engineering paper “Creating Systems That Work”).

We wanted methods that were significantly simpler than the problems they are trying to solve - so that someone can start to get to grips with the issues. The ideal format for this would be to have an event where the participants could have a go at the technique at the event. A test of simplicity was whether the technique could be introduced to a group to a level where they could start to use it within an hour / hour and a half. This seemed to require an event longer than a standard evening meeting. So, when the requirement for “local” one day events was proposed by the INCOSE UK Council the BLG jumped at the opportunity.

The concept was to have a case study, and then a round robin of four techniques that everyone could try. The BLG developed a case study around the idea of protecting the earth against asteroid strike. This is a very powerful case study for teaching purposes - there is a lot of complexity, a lot of levels, and a range of issues (ranging from people, politics, organisation, to the technical difficulties of flying a rocket to a meteorite and exploding a nuclear device at the right range!). It is intended to write up this case study as a “teaching aid” and make available to the INCOSE community. A 40 minute presentation of the issue and the “preliminary thoughts” was presented to the whole group - then they divided into teams to try out and learn the simple techniques.

Four techniques were presented - namely “Six honest serving men” - by Terry Winnington (University of the West of England) and Doug Cowper (Cleave Systems); “Stakeholder Analysis” by Emma Langman (Progression Partnership) and Ian Gibson (Sula Systems); “N-Squared” by Chris Lamb (Sula Systems), and Quality Function Deployment (QFD) presented by Richard Beasley (Rolls-Royce), supported by Stephen Bryant (Renishaw / University of Bristol). Each session took the format of a brief explanation of the technique, a facilitated workshop applying the technique to the asteroid problem, and then a final reflection of the usefulness and simplicity of the technique. These feedbacks on the methods were collated by Jonathan Rees (Rolls-Royce).

How the delegates got on

Overall, the feedback on the event and the day was that it was enjoyable and thoroughly engaging. Delegates really seemed to appreciate getting to grips with a range of techniques. Most gratifying was one comment that “it was great to focus on techniques that get you thinking about the problem” - requirement for the event met.

On the techniques two clear issues emerged. 1) whilst the techniques were simple principles, they weren't necessary “simple” to use, and (to various degrees) expert facilitation was necessary. Therefore there is still a role for a Systems Engineer (hooray!) and a key aspect of their skill is to facilitate communication and engagement from involved people from range of disciplines using simple techniques. 2) Simple is a good start, but we need to work on how to transition the initial understanding from the simple into the more complex and intricate techniques that allow detailed design and solution creation to continue. A subject for further reflection and another workshop perhaps?

The feedback after the event was generally positive - the event was felt to be value for money and useful. Some felt that doing four rounds of technique was quite like hard work and perhaps one less method might have given more time to allow a little more time with each technique.

Whilst the techniques are simple in principle, applying them was considered by some to be hard (and therefore time needed to be spent learning). Overall, the intention to get back into using simple methods to think about systems problems was achieved.

Reflections on the event

Firstly, the event could not have worked without the attendance, and the willing and energetic participation of the delegates - so thanks to them for their commitment and contribution to the event.

Secondly - to the event organisers and the venue - Emma Jane at Dot-The-Eye and the BAWA staff. There was lots of paddling below the surface at times, but from the top all looked serene and calm, and any problems did not impact on the operation of the event.

Finally - I am always amazed at the generosity of time and effort by “enthusiasts” as exhibited by the presenters. All took time out from day jobs and made an enormous commitment in terms of time and energy. Presenting the same presentation and facilitating the same workshop four times in a day to four different groups is a very disorientating experience - I am sure at least one group got the same joke twice!

Overall, this seemed to me to be what INCOSE aspires to - it was an informal, fun event; focusing on “how things are done” rather than the cleverness of the output - and methods and techniques were freely shared to better enable the application of the Systems Engineering approach.

Richard Beasley
Bristol Local Group
A Delegate’s view

The workshop title grabbed my attention, “Simple systems techniques that work”, was this the silver bullet I had been searching for that would make my life as a systems engineer easier? When I turned up on the day it appeared, from the number of experienced engineers present, that many delegates may have had a similar idea.

As it turned out, the day was an excellent primer for some basic engineering techniques and an opportunity for all to learn from the experiences of others. I found that the day enabled those less familiar with ‘Systems’ Engineering to place the skills in context as well as allowing others to reaffirm familiarity with the skills and techniques.

The workshop aimed to cover six simple techniques that had been grouped into four sessions, as follows:

- N-Squared Charts
- Quality Function Deployment (QFD)
- Six honest serving men plus How to define a systems project
- Stakeholder Identification plus Balancing conflicting requirements

Upon arrival, a working scenario was presented to all delegates which was to be used throughout the day to allow the systems techniques to be exercised. The workshop scenario was the topical issue of how to save the earth from meteor attack. This scenario was useful in that it was able to present delegates with the realistic situation of trying to make sense of conflicting requirements and viewpoints as well as raising a number of potential solutions. Everyone responded positively to the scenario and the challenge of saving the planet.

After the general briefing, delegates were randomly organised into four groups and circulated through the four sessions, spending around 90 minutes in each.

**N-Squared Charts**

N-Squared techniques were presented by Chris Lamb of Sula Systems Ltd.

The use of N-squared charts is a functional analysis technique that provides a means to minimise connectivity, maximise cohesion and minimise coupling between functions. The method was originally developed in the 1960s as a technique for developing data interfaces.

The method involves placing identified system functions onto the diagonal of an N x N matrix with function outputs arranged horizontally and inputs arranged vertically. This arrangement facilitates the identification of functional completeness, identification of tightly related functional groups, nodal points and critical functions.

The group commenced with mapping potential functions for a meteor protection system onto the diagonal of the N-Squared chart, such as: detection, tracking, decision analysis and response implementation. Then inputs and outputs were considered for each function with the aim of identifying control loops and lack of completeness.

To arrive at an “ideal” solution may require numerous iterations to properly diagonalise the n-squared chart. By its nature this technique lends itself to formal mathematical methods.

This technique appears to naturally fit within the systems analysis stage of the systems lifecycle as evidenced by its historical origins.

Quality Function Deployment

The Quality Function Deployment (QFD) session was given by Richard Beasley from Rolls Royce.

QFD, which has its origins in Japanese manufacturing, is a widely used methodology for analysing a set of requirements, particularly in terms of considering completeness and integration of requirements with functionality. The technique is applied through the QFD “House of Quality”. This is a matrix comparison of customer needs against technical function. The application of QFD can be carried out iteratively as more detail and complexity is uncovered.

Delegates were given guidance on how to map the stakeholder requirements to technical requirements and then determine the strength of relationships and trade-offs between the groupings. The functions developed in the previous N-Squared session were mapped into the QFD chart providing a good linkage between sessions. I would assume that this technique would best be applied at the later stages of the requirements analysis part of the systems life-cycle after an initial apportioning of requirements has been carried out.

Although extensive software packages exist for QFD analysis, good results can be achieved by applying the technique with a simple pen and paper or spreadsheet approach.

**Six Honest Serving Men**

Six honest serving men and systems project definition was presented by Dr Doug Cowper from Cleave Systems Ltd.

Six honest serving men is taken from Rudyard Kipling’s “Just So Stories” and the six honest men are: What, Why, When How Where and Who. In defining a Systems project, the application of these six questions can initiate the creative processes and allow one to better examine a problem space. The questions give us the basis to then examine the problem from different viewpoints (ie. Stakeholder views). By examining the different viewpoints with relation to the solution space we can clarify and better understand our requirements set.

Delegates were introduced to one of the techniques used to organise and structure the various viewpoints which is the Zachman Framework. This allows the various viewpoints to be organised with the six questions into a matrix which assists in understanding and analysis and systems project definition.

The organisation of questions, viewpoints and candidate solutions into a framework provides rigour to the analysis and assists in identifying gaps in the understanding.
This technique would appear to naturally fit into the requirements analysis phase following on from initial stakeholder identification.

**Stakeholder Identification**

The session on Stakeholder Identification and balancing conflicting requirements session was given by Ian Gibson of Sula Systems Ltd and Dr Emma Langman of Progression Partnership Ltd.

The session started with a discussion on stakeholders and their relationship to the problem space. In particular, it was stressed that stakeholders need to be considered for each stage of the full system life-cycle.

An aid to this holistic thinking is the “Stakeholder Dartboard” where a system life-cycle (eg. ISO-15288) or another structural breakdown (eg. DLODs) is mapped onto the problem and solution space to allow stakeholders to be identified and placed in the context of the life-cycle or structural phases.

Initially the group were tasked with considering all stakeholders for the meteor protection system and mapping them onto the dartboard.

![Stakeholder Dartboard](image)

Following stakeholder identification, to assist in identifying and analysing the stakeholder requirements, the delegates were introduced to the CATWOE Mnemonic. This approach was developed in the 1970s and is derived from systems engineering approaches for analysing complex situations where divergent viewpoints exist and is part of business process modeling or soft systems methodology (SSM).

The six elements of CATWOE are a useful element in developing a “root definition” of stakeholder relationships with respect to transformations within an organisation or system. The six elements are:

- **Customers** - the beneficiary (or victim)
- **Actors** – the person or organisation doing the work
- **Transformation Process** – that which is to be done
- **World View** – the cultural context
- **Owner** – a person/organisation who makes Go/No-go decisions
- **Environmental Constraints** - relevant constraints

CATWOE, then assists in the identification of the people, processes and environment that contribute to a situation, issue, or problem that needs to be analysed.

Applying the CATWOE terms it is then possible to define a statement or root definition of the transformations needed within an organisation or system appropriate to the problem and solution space. The group was tasked to develop a root definition of the meteor protection system based upon the stakeholder requirements developed.

The session continued with examples and discussions on change management and recognising and dealing with constraining mindsets. This is particularly useful for eliciting requirements from stakeholders with differing viewpoints.

The group was introduced to the concept of “the expert trap” where our mindset can influence decision making and impact our ability to act impartially and understand what a stakeholder truly wants.

A number of group work approaches were discussed that can assist in eliciting true stakeholder requirements, these approaches are aimed at breaking down barriers and enabling meaningful communications to take place.

The session ended with a discussion on the secret to resolving conflict.

In summary, I found this to be a very useful and interesting day with plenty of opportunity to network. Taking a basic pen and paper approach to tackling these systems engineering techniques served as a good reminder of the basic theory that underlies the techniques and drives some of the tools we use. I found this event reinforced the idea that you need to understand why you are doing something and what you are trying to achieve. Proof, if needed, that even with clever tools the systems engineer still needs to use their brain and experience.

Although we made a good start on saving the planet, I suspect it might take more than one day and a few more engineers than were present. I would certainly recommend the INCOSE one day events.

The organisation is superb and the events represent a very cost effective training and networking forum.

Stephen Fisher
Rail Interest Group

How Not To Do Systems Engineering

Until this year, Rail Interest Group (RIG) events had been designed to serve positive systems engineers who are working hard to make their project a success. On 2nd February 2010, the RIG hosted its first event for the community of project saboteurs.

In the informal environment of the function room at the Duke of York pub in Fitzrovia, a number of experienced systems engineers described systems-related methods of bringing a project to its knees. There was then an opportunity for the audience to describe further methods, and a discussion on which methods were most effective and prevalent. Informal discussions continued over drinks deep into the evening.

The result was the table below.

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<thead>
<tr>
<th>Risk</th>
<th>Prevalence</th>
<th>Effectiveness</th>
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<tbody>
<tr>
<td>“Contract soup” (Create contracts with perverse incentives, complex decision making procedures and long communications chains)</td>
<td>●●●</td>
<td>●●</td>
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<tr>
<td>“Right shift” (Start SE late and/or delay SE activities)</td>
<td>●●</td>
<td>●●●</td>
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<tr>
<td>“One size fits all” (Do not tailor the approach to SE to the project)</td>
<td>●●</td>
<td>●●●</td>
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<tr>
<td>“Hide the big picture” (Make sure that the team do not understand the system as a whole)</td>
<td>●</td>
<td>●●●</td>
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<tr>
<td>Keep a key stakeholder out of the requirements-setting loop</td>
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<tr>
<td>“Change horses” (change a fundamental aspect of the technology part way through the project)</td>
<td>●●</td>
<td>●●●</td>
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<tr>
<td>Manage time and cost but compromise on quality</td>
<td>●●●</td>
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<tr>
<td>Create SE artefacts (requirements databases, architectures and so on) of such monstrous complexity that no-one can understand them</td>
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<td>“Model the universe” (Do not focus the models on the areas that matter)</td>
<td>●●</td>
<td>●</td>
</tr>
<tr>
<td>Fragment the SE information between multiple repositories</td>
<td>●●</td>
<td>●</td>
</tr>
<tr>
<td>“Never say no” (Never reject any request to add features)</td>
<td>●</td>
<td>●●</td>
</tr>
<tr>
<td>Large staff turnover</td>
<td>●●</td>
<td>●</td>
</tr>
<tr>
<td>Excessive left-shift (Spend all the SE budget at the beginning)</td>
<td>●</td>
<td>●</td>
</tr>
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</table>

Key

<table>
<thead>
<tr>
<th>Prevalence</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Seen in practice by a few of those present</td>
<td>● May cause problems</td>
</tr>
<tr>
<td>●● Seen in practice by many of those present</td>
<td>●● Likely to cause serious problems</td>
</tr>
<tr>
<td>●●● Seen in practice by most of those present</td>
<td>●●● Very likely to cause serious problems</td>
</tr>
</tbody>
</table>

The table is not just of value to project saboteurs. Positive systems engineers will find in it a ranked check-list of system-related risks that they may wish to apply to their current and future projects to see if there are problems that require attention. Systems engineers from outside the rail sector may still find the check-list of relevance.

A touch of humour in licensed premises added a bit of fun to a serious topic and the feedback on the event was universally positive.

All are welcome at RIG events. The programme can be found at the INCOSE UK website www.incoseonline.org.uk
They could find it. In the following year he went on to order his:

To enter any premises to remove nitrate-containing earth wherever making saltpetre. By 1625, Charles I had empowered saltpetre makers in England through the use of monopoly licences for gathering and vegetable matter. Saltpetre production came under state control in which it had formed naturally by the decomposition of animal and vegetable matter. It was obtained by dissolving it from earth in and charcoal, grew. Of these, saltpetre was the hardest to get hold of and stale, without mixture of water or other thing put therein. Which use the best means of gathering together and preserving the urine together whilst in their stables and stalls, and that they be careful to:

Year, and all the stale of beasts which they can save and gather

In the middle of the ninth century AD, the Thang alchemists were actually searching for the elixir of life when they made their chance discovery of gunpowder – one of the most remarkable examples of inventing one thing while looking for something else.

The Chinese quickly improved their crackers, hitherto just lengths of bamboo cane thrown on to a fire. They went on to produce other fireworks – rockets, coloured flames and sparklers. During the eighteenth century, they found gunpowder could be used to make simple bombs and grenades. The production of two of gunpowder’s ingredients, sulphur and saltpetre, came under government control and in 1067 the Emperor banned their sale to foreigners. It was necessary to arm the million-plus Chinese army against the Mongol attacks.

Western Europe was introduced to gunpowder in the mid-thirteenth century. Soon after China invented cylindrical metal barrels with close-fitting projectiles. This time it took only 50 odd years for Western Europe to catch up. It is likely at least two guns were at the 1346 Battle of Creche that started the Hundred Years war. These primitive guns were noisy, but did hardly any damage. Effective guns had to wait until the casting of huge barrels of bronze and iron was perfected. Then the French King ended the Hundred Years war by destroying the remaining English castles in Normandy at the rate of five a month.

Cannons had until now used a stone shot that did comparatively little damage. What was needed was to fire a projectile that would explode on contact with the target. Barrels had continued to get stronger and by about 1500 solid cast-iron round shot could be fired. The next step was to hollow out the shot and fill it with incendiary mixture. Holes were made in the shell to take a fuse. Why did they not use an explosive mixture instead? The problem was getting the fuse timing right. It was very much a hit and miss affair. It took the invention of the watch in 1674 to finally make the use of explosive shells safer and more popular.

The demand for gunpowder and its ingredients of saltpetre, sulphur and charcoal, grew. Of these, saltpetre was the hardest to get hold of in Western Europe. It was obtained by dissolving it from earth in which it had formed naturally by the decomposition of animal and vegetable matter. Saltpetre production came under state control in England through the use of monopoly licences for gathering and making saltpetre. By 1625, Charles I had empowered saltpetre makers to enter any premises to remove nitrate-containing earth wherever they could find it. In the following year he went on to order his:

“Loving subjects... inhabiting within every city, town and village... shall carefully keep and preserve all the urine of man during the whole year, and all the stale of beasts which they can save and gather together whilst in their stables and stalls, and that they be careful to use the best means of gathering together and preserving the urine and stale, without mixture of water or other thing put therein. Which our commandment and royal pleasure being easy to observe, and so necessary for the public service of us and our people, that if any person do be remiss hereof we shall esteem all such persons contemptuous and ill affected both to our person and estate, and are resolved to proceed to the punishment of that offender with what severity we may.”

This is certainly one of the most remarkable requirements coming under the heading of: “England expects...” The East India Company relieved this pressure by importing Indian saltpetre on a regular basis from 1630 onwards.

A good job too. Gunpowder began to be used for blasting in mines. This was introduced in 1638 by Prince Rupert to the Ecton copper mines on the Derbyshire – Staffordshire border. By 1690 the use of gunpowder had reached the Cornish tin and copper mines.

Gunpowder then began to be used in civil engineering. The first gunpowder use was for the Languedoc Canal linking the Mediterranean to the Bay of Biscay. Opened in 1681, it was 240km long, had a 100 locks and a 165m long tunnel.

Gunpowder helped build the canals like the Bridgewater Canal opened in 1757 to carry coal from the Worsley mine into Manchester. The canal system reached its height in 1838 when there were 7000km of canal covering most parts of central England and travelling through 75km of tunnel.

Canal usage gave way to railways with its building boom lasting until about 1880. What gunpowder did for canals, it also did for the railways, though at first it was not required in large quantities as the new tracks were laid on level ground. Isambard Kingdom Brunel began work in 1836 on that: “monstrous and extraordinary, most dangerous and impracticable tunnel at Box”, which was to link London with Bristol. The tunnel, almost 3.3km long was opened in 1841.

Using gunpowder in the mines, and helping to build canals and railways did not come without problems. The work was both hazardous and laborious. The first step to solving this came in 1831 from Cornish miner, William Bickford. He invented the safety fuse comprising a 12mm diameter rope with a trail of gunpowder down the centre. This had a fairly constant burning time, so the shot-firer could pick the rope’s length to give him enough time to get to safety.

The second step came in 1867 with the advent of compressed air rock drills. This removed the hard labour of drilling the shot holes for the gunpowder. By then, the days for blasting by gunpowder were numbered.

Why didn't gunpowder continue to enjoy its success in these various streams of endeavour? Alfred Nobel best described it when he wrote in 1875:

"That old mixture possesses a truly remarkable elasticity which permits its adaptation to purposes of a most varied nature. Thus, in a mine it is wanted to blast without propelling; in a gun to propel without blasting; in a shell it serves both purposes combined; in a fuse, as in fireworks, it burns quite slowly without exploding. Its pressure exercised in these numerous operations, varies between (more or less) one ounce to the square inch in a fuse to 85,000 pounds to the square inch in a shell. But like a servant of all work, it lacks perfection in each department, and modern science, armed with better tools, is gradually encroaching on its old domain."

Even in this short sketch of the history of gunpowder we can see many of the familiar Systems Engineering problems we face today in our various projects. This summarisation also offers new opportunities in understanding the natural cycle of tools that can be used in different systems engineering projects, which I will leave the reader the pleasure for discovering for himself or herself.

O. B. Server
INCOSE UK supports a number of local groups and working groups to provide its members with opportunities to play an active part in the development of systems engineering in the UK. Further details are available from the INCOSE UK website www.incoseonline.org.uk.

Scottish Local Group

The Crawford Collection

Ten individuals will have the opportunity to view the Crawford Collection on the evening of 4th May 2010. This collection is a gift from James Ludovic Lindsay, 26th Earl of Crawford (formerly Lord Lindsay) to the Royal Observatory Edinburgh. Lindsay was a distinguished amateur astronomer who, using the library catalogue of the Imperial Observatory at St Petersburg and the advice of Otto Struve, its Director, set up a private observatory on the family’s country estate at Dun Echt, Aberdeenshire in 1872. Within ten years, Lord Lindsay had amassed a library of 11,000 books, forming one of the great scientific collections of the world.

VISTA – F/1 maps the Southern Sky

A talk by Andy Born on the practical application and tangible benefits of utilising Systems Engineering in the development and execution of the VISTA telescope, from its highly innovative conception to its use today by European Astronomers to map the southern sky at infra-red wavelengths will take place on 4th May 2010 in Edinburgh.

Rail Interest Group

Railway Systems Engineering Workshop

The Rail Interest Group is holding its second Railway Systems Engineering Workshop on 22nd June 2010 in London. The workshop will adopt the format used with such success last year. It will tackle a number of topics that we know are of concern to our members. Each topic will be explored in a number of short presentations by practitioners active in the field describing real, current activities with balanced reflections on their effectiveness. The day-long duration will allow participants to listen to several perspectives on each question and then discuss whether an answer is emerging. The overall theme of the event is ‘Railway Systems Engineering in a Tough Economic Climate’.

Further details and a Call for Presentations are available from the INCOSE UK website.

Bristol Local Group

Systems Research Showcase

INCOSE Bristol Group held its annual (strictly speaking 2nd in two years) research “showcase” on 24th March at Bristol University. Three speakers each presented a short summary of the research they are carrying out, with all of them focussing on how they have used different aspects of modelling to support their work.

Peter Hale (a PhD student at UWE) discussed his research looking at trying to integrate the development of analysis and design software with the design process to make the two more integrated. Designers tend to think in diagrams and pictures - but the software is not accessible in the same way. Peter’s focus was on getting the model to reflect what the designer is doing - by making computer programming methods more accessible - he is working on the idea of turning the software methods into a “system to create systems”, where the designer uses his understanding to pull in what he wants.

Neil Cahart (an EngD student at Bristol University) described the use of System Dynamics models to understand safety event analysis. His work is driving the generation of dynamics models (qualitative), which expose various archetypes of behaviour, often non-intuitive (because dynamic situations are frequently misunderstood), and developing new archetype solutions to problems within the specific industrial domain. There was clear evidence that simple dynamic models can produce insight and understanding quickly, in ways that are useful to the wider community.

Dr Nick Forbes (a Research lead at Bath University) described work he is doing modelling the complexity of collaboration between autonomous systems and humans. At the current stage of the research, this involves working out the various process and modelling approaches that will give an understanding of how groups of autonomous systems will collaborate.

Each lecture was followed by a lively discussion. In all cases similar points arose - needing to remember why you are modelling, examining / considering how you know if the model is producing useful results, and the danger of getting too involved in the process of modelling and so losing sight of the purpose.

Hopefully the presenters appreciated the chance to air their work in front of an interested and knowledgeable audience. The questions were detailed and intense, and probably gave each researcher enough ideas for double the level of research that they are doing - this was all meant to be helpful!

Thanks to Bristol University for the venue, the audience for the contributions and discussion, and especially the researchers for sharing their ideas so briefly yet eloquently.

We hope to run a similar event next year - so any researchers who want a friendly forum to discuss their ideas in front of the Bristol audience please let a member of the BLG committee know.

South Coast Local Group

Help Needed!

We are in the process of forming a South Coast Local Group of INCOSE UK, to provide an opportunity to share ideas with like-minded colleagues in an easy-going evening atmosphere. Attendance to South Coast Group events will not be restricted to INCOSE members and, where possible, will be free of charge.

This group will only work if we have sufficient support and at this stage we would like to gauge potential interest.

If you are interested, based around the South Coast region, might attend one of our forthcoming events and want to find out more, please contact one of the committee members via the INCOSE UK website www.incoseonline.org.uk.

Forthcoming events

We are arranging our inaugural event and this is likely to include a presentation on the Galileo Satellite programme.
I'm delighted to write a few words as the new Chair of the INCOSE UK Advisory Board. Firstly I would like to extend my appreciation to Jo Stoves of Thales for her work as the previous Chair, and express my hope that my time in the role is equally successful. I am happy to announce our first new corporate member under my watch, and to welcome MBDA to the UKAB, represented by Les Oliver. We have a few more enquiries/applications in hand and so I look forward to bringing you some more news soon. Please feel free to contact me with any issues you want to raise, or any other more general enquiries about the UKAB.

Alan Harding, BAE Systems
UKAB Chair

UKAB Members
## Events Calendar

The INCOSE UK events calendar is shown below. For updates, more information and registration visit the INCOSE UK website at [www.incoseonline.org.uk](http://www.incoseonline.org.uk).

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Organisation &amp; Location</th>
<th>Description</th>
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<tbody>
<tr>
<td>20 April 17:30 for 18:00</td>
<td><strong>Railway Interest Group</strong>  UCL’s Engineering Building, Torrington Place, London WC1E 7JE</td>
<td>Nimrod and the MoD: missed opportunities &amp; lessons for rail Nigel Murphy, Technical Director of Atkins Rail Systems Consultancy, will be relating the findings from a recent review conducted for the DfT.</td>
</tr>
<tr>
<td>04 May 18:00 - 18:30</td>
<td><strong>Scottish Local Group</strong>  UK Astronomy Technology Centre Royal Observatory Edinburgh EH9 9LA</td>
<td>Viewing of the Crawford Collection: The Crawford Collection of books and manuscripts at the Royal Observatory Edinburgh, one of the most extensive and valuable astronomical libraries in the world. Only 10 places are available.</td>
</tr>
<tr>
<td>04 May 18:30 - 20:00</td>
<td><strong>Scottish Local Group</strong>  UK Astronomy Technology Centre Royal Observatory Edinburgh EH9 9LA</td>
<td><strong>VISTA – F/1 maps the southern sky</strong> A talk on the Systems Engineering aspects of the design, installation and commissioning of the world's largest and fastest infra-red telescope.</td>
</tr>
<tr>
<td>11 May Early Evening</td>
<td><strong>Railway Interest Group</strong> Parsons Brinckerhoff, Devonshire Square, London</td>
<td>&quot;The Roots of Systems Engineering&quot;, Eddie Goddard, LU. This is the new date for this event, previously the 16 March.</td>
</tr>
<tr>
<td>19 May 18:30</td>
<td><strong>Bristol Local Group</strong> Room 3D06 on the University of the West of England (UWE), Frenchay Campus, Bristol</td>
<td>Risk: Framing for Consistency This forum is an opportunity for practitioners, managers, and academics to discuss a framework that goes beyond today’s 'probability * impact = risk' mentality, and basic three-point estimating, in order to extend the power and flexibility of ERM through simulation modelling.</td>
</tr>
<tr>
<td>23 May, 26 May Full Days</td>
<td><strong>INCOSSE International</strong> Stockholm, Sweden</td>
<td>EuSec Systems Engineering and Innovation</td>
</tr>
<tr>
<td>25 May Early Evening</td>
<td><strong>Railway Interest Group</strong> Finnmeccanica, London</td>
<td>&quot;The Application of SE to the Tender Phase of a Major Project&quot;, Garry Greenland, Parsons Brinckerhoff</td>
</tr>
<tr>
<td>08 June 18:30 - 20:00</td>
<td><strong>Scottish Local Group</strong> Edinburgh University Business School (TBC)</td>
<td>A System for people System engineer’s formula for avoiding crippling mistakes and delivering success: in relationships at work and elsewhere. Speaker: David Fraser</td>
</tr>
<tr>
<td>22 June All Day</td>
<td><strong>UK Chapter</strong> No.4 Hamilton Place, London W1J 7BQ United Kingdom</td>
<td>2nd Railway Systems Engineering Workshop ‘Railway Systems Engineering in a Tough Economic Climate’ This year's INCOSE RIG one-day workshop will share experiences and best practice in the application of systems engineering to rail projects, with particular emphasis on the benefits of Systems Engineering during tough economic times.</td>
</tr>
<tr>
<td>11 July - 15 July Full Days</td>
<td><strong>INCOSSE International</strong> Chicago, IL USA Hyatt Regency O’Hare 9300 W. Bryn Mawr Ave. Rosemont, IL 60018 USA 847-696-1234</td>
<td>20th Annual INCOSE International Symposium</td>
</tr>
</tbody>
</table>
**Upcoming Events**

**EuSEC 2010**

*Systems Engineering and Innovation*

The 7th bi-annual European Systems Engineering Conference (EuSEC) will be held from **23rd to 26th May, 2010** at the campuses of the Royal Institute of Technology and the Swedish National Defence College Stockholm, Sweden.

The INCOSE EuSEC Conference provides the premier European forum for Government, Industry and Academia to learn more about Systems Engineering, and to share knowledge on the most recent innovations, trends, experiences and concerns.

The theme of the conference is "Systems Engineering and Innovation" and aims to inspire attendees by providing practitioners with insights from Systems Engineering research and practice, and researchers with an exposure to real-world challenges and examples. Participants should leave the conference with a unique understanding of the challenges of handling innovation in Systems Engineering, the research and solutions currently available, as well as future solutions and pointers to research directions in the area.

Details of this conference, including: programme, speakers and content can be found at the INCOSE UK website at [www.incoseonline.org.uk](http://www.incoseonline.org.uk)

**IEEE SoSE**

*SoSE in Sustainable Systems for 21st Century*

INCOSE UK is involved in the 5th IEEE International Conference on System of Systems Engineering (SoSE) and 2010 US-SoSE and the European-SoSE Joint Workshop

IEEE SoSE 2010 is to be held in Loughborough, UK from the **22nd to the 24th June 2010**, in addition, a SoSE Workshop will take place on 25th June, 2010.

Conference Theme: *SoSE in Sustainable Systems for 21st Century*

INCOSE UK has been asked to assemble and run one of the sessions at the event and we are looking forward to having an active role in the event. We will give you more details about the session in due course.

If you would like more information about the event please use the following link: [http://www.ieeesose2010.org](http://www.ieeesose2010.org)

**ASEC 2010**

The INCOSE UK Annual Systems Engineering Conference (ASEC10) will be held from the **8th to 10th November 2010** at the Heythrop Park Hotel, Chipping Norton, Oxfordshire. The 2010 Conference web site can be found at [www.incoseonline.org.uk](http://www.incoseonline.org.uk).

A note for your diaries! 2010 will see the introduction of a new 3-day INCOSE UK conference format offering a combination of plenary presentations, tutorials, workshops and discussion sessions. We've decided to call this the Annual Systems Engineering Conference (ASEC) and it combines the successful formats used for our previous Spring Conferences and Autumn Assemblies. The theme for ASEC10 will be “Systems Engineering: Adding Value in Challenging Times” and we look forward to seeing you there!

**INCOSE UK Annual Systems Engineering Conference**

**8th – 10th November 2010**

“Systems Engineering: Adding Value in Challenging Times”

**Call for Presenters**

To support this, we invite high quality presentations on all aspects of Systems Engineering research, practice and application. These presentations will be delivered to the plenary conference and the length of each one will be around forty minutes (including questions and answers).

Please send your 300 word abstracts to Andrew Farncombe, INCOSE UK Technical Director, at andrew.farncombe@incose.org (phone: +44-(0)1494-672254), no later than 14th May 2010.
Leading-Edge Project Training
in London and Amsterdam

Cognitive Systems Engineering
5-Day Course & Workshop
This world-leading course teaches methods of cognitive analysis and
cognitive design, and illustrates how they can be applied to enhance
human systems effectiveness and safety within system development and
acquisition.

LONDON, UNITED KINGDOM
24 – 28 May 2010
Presented by Dr. Gavin Lintern
Course Code: F1082-5
Holiday Inn London - Bloomsbury
8:30am to 5:00pm daily

Fee Structure
Standard Fee GBP2,120
*Group fee applies to registrations of 3 or more delegates at the
same time. Earlybird/Group Fee GBP1,908
**Course dates are subject to change. Please check website for
program updates.

Who Should Attend?
- Human System Integrators
- Project Managers
- Systems Engineers
- Project Analysts
- Design Engineers
- Project Directors
- Team Leaders

Anyone directly involved with analysis and design of
Human Systems functionality who develop
sub-systems with which humans must interact.

More information: www.ppi-int.com/training/cognitive-systems-engineering.php

Requirements Analysis
5-Day Course & Workshop
This course provides an effective, efficient and practical methodology
for capturing and validating requirements of all types in all circumstances.
The principles and methods of organizing requirements into requirements
specifications are then addressed.

AMSTERDAM, NETHERLANDS
6 – 10 September 2010
Presented by Mr. Robert Halligan
Course Code: F007-263
Hotel Amsterdam - De Rode Leeuw
8:30am to 5:00pm daily

Fee Structure
Standard Fee EUR2,075
*Earlybird/Group Fee EUR1,962
**Course dates are subject to change. Please check website for
program updates.

Who Should Attend?
- Acquirer Personnel
- Supplier Personnel
- Developer Personnel
- anyone who, in any capacity,
deal with requirements

More information: www.ppi-int.com/training/requirements-analysis-specification-writing-course.php

PPI is a Bronze Sponsor of both EuSEC 2010 and INCOSE International Symposium 2010.
The Back Page

Book Review

**Relationships Made Easy. How to get on with the people you need to get on with... and stay friends with everyone else.**


Reviewed by: Hillary Sillitto, CEng, FInstP, ESEP

In my appraisal a few weeks ago, I got the best performance rating of my entire career, and my boss said senior colleagues were asking him “what on earth did you do to Hillary to make him so effective?” Neither of us had an answer at the time, but then it dawned on me. Quite early in the review period, I had seen the first draft of Relationships Made Easy, and discussed it at length with the author and friends during a sailing holiday on the west coast of Scotland. I don’t know if the insights from this book account for my excellent performance rating, but they certainly helped.

The idea for the book came partly from David Fraser’s experiences working across the cultural divide between a Government client and commercial prime contractor, who are jointly responsible for the operation of a very complex infrastructure system; and partly from the discovery that many of the techniques were equally useful in relationships with family and friends. As a review panel, albeit one gathered in the confines of a boat rather than the more usual conference room, we all found immediate relevance for the ideas both in our work and private lives.

This excellent and very readable book presents an integrated system for effective relationships, drawing several different domains and inspirations together into a freshly unified approach. The structure is really good and clear and logical, and the content equally useful in professional, social and family contexts. If you want top performance ratings at your next appraisal, and if you need to bridge across cultural and behavioral divides to solve complex system problems, or just get on with people more easily and effectively, then this book might just be what you need.

The author argues that developing our relationship skills is “an easy route to success and one of the few reliable and enduring ways we can improve our lives”.

The book draws on practical psychology, Neuro Linguistic Programming (NLP) and life and career experience to offer a systematic, practical and intelligent approach to achieving success with other people. The author recommends we pick up and use the tools that are already out there and the book includes many real-life and personal examples and an abundance of practical techniques and tips.

The author says the book is “for anyone who wants to improve their relationships and to have the confidence that comes from knowing they have the skills they need”, and will enable you to:

- Have successful relationships at work and at home
- Be certain your interpersonal skills aren’t letting you down
- Sort out disputes
- Be confident with other people
- Be happy and successful in life

I have found Relationships Made Easy to be a book to read through, reflect on, and return to many times.

Hillary Sillitto, CEng, FInstP, ESEP

And finally ...

Welcome to the Spring 2010 issue of Preview. This is my first edition of the magazine since taking over as Preview Editor from Malcolm Gardner at the end of 2009. I hope you find the handover transparent as I’ve aimed to maintain the high editorial standards set by Malcolm. Many thanks to Malcolm for the excellent job he has done in the role of Preview Editor over the last few years.

I would like to take this opportunity to invite members to participate by submitting your Systems Engineering news, views, contributions, etc. for publication in Preview. (Email to: Steve.fisher@incose.org).

Finally, don’t forget the revamped conference format that kicks off this year with ASEC 2010 (see the events page for more info). Time to plan your attendance and maybe submit a paper.

Stephen Fisher
Preview Editor
INCOSE UK

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If you have an event you would like publicised in Preview, or wish to contribute an article, please contact the Preview Editor, Stephen Fisher by email at Steve.fisher@incose.org

**Not an INCOSE Member?**

Join INCOSE UK To-day!

**How do I join?**

Fill in the on-line application at www.incoseonline.org.uk

**What does it cost?**

Full members pay £72 per annum (reducing to £68 if paying for a full year by direct debit). Students pay £20 per annum.

Membership subscriptions are eligible for tax relief. The UK Chapter has been approved by the Board of Inland Revenue under Section 201 Income and Corporation Taxes Act 1988.

**What are the benefits?**

- A UK and world-wide forum for systems engineering
- UK and International Interest groups, Working Groups and Conferences
- A chance to influence the way Systems Engineering develops
- The opportunity to network and learn from other Systems Engineers

Preview is the Quarterly Newsletter of the UK Chapter of INCOSE, the International Council on Systems Engineering. All INCOSE UK members receive a copy of Preview, in addition to the regular e-mail bulletin ePreview. INCOSE UK Members may also subscribe to the quarterly Systems Engineering Journal, and INSIGHT, the INCOSE Newsletter.