



preview

International Council On Systems Engineering UK Chapter Newsletter

September 2003

in THIS ISSUE

Profile on Dipesh Patel	2
Presidents Corner	2
Book Review	3
Events Calendar	6
Your Questions Answered	6
Around the Regions	7
Who to Contact	8

Astrium joins the UKAB

INCOSE UK is pleased to announce that Astrium has joined the UK Advisory Board (UKAB) as its fifth member. At the UKAB meeting held at UCL on the 4th September, Les Oliver was welcomed as the representative of Astrium. The meeting also welcomed Dr Ayman El-Fataty as the new representative for BAE SYSTEMS who is taking over from Samantha Brown; the UKAB recorded its thanks to Samantha, for her participation and help in the set up of the UKAB.

The UKAB meeting discussed and agreed its terms of reference which will be presented to the UK Board at their next meeting. The main role of the UKAB is to advise on strategy, issues, and priorities, and to establish links with the employers of members.

The UKAB has nominated the following working group topics of interest to UK industry:

- Systems Engineering module for all undergraduate engineering courses (WG jointly run with the Royal Academy of Engineering, initial meeting held 24th March).
- The Business Case for Systems Engineering
- Core Competencies of Systems Engineering
- MoD SMART Acquisition (initial meeting held at the Washington Symposium).
- The Systems Integrator
- Collaborative Engineering
- Re-use
- Stakeholders and their influence (e.g. preference engineering)
- Small systems Systems Engineering (i.e. within an SME)

The UKAB discussed and has provided some ideas about the format of future INCOSE UK events and has suggested the following themes:

- Technology Planning
- Systems Engineering within Consortia

The UKAB meeting explored a list of other potential members, so if your organisation would like to join the UKAB, please contact Paul Davies, or Prof. Alan Smith (Chairman of the UKAB) on 01483 204147 or email as@mssl.ucl.ac.uk.

The next UKAB meeting will be held in December.

In brief

New chairman for the IEE systems engineering professional network

Dr Jon Holt of Brass Bullet Ltd has been appointed as the New Chairman for the IEE's Systems Engineering Professional Network Executive Team. Jon has succeeded Steve Willmott of the National Air Traffic Services (NATS) who launched the Systems Engineering Professional Network.

Launch of the Stevenage group

The INCOSE UK Stevenage Group was launched with its inaugural meeting on the 10th September at EADS Astrium in Stevenage. A report on the event can be found on page 7.

Stop press - General Dynamics joins the UKAB

INCOSE UK is delighted to announce that General Dynamics has signed up to the UK Advisory Board (UKAB) as its sixth member.

Editor's note

Welcome to another edition of Preview. I gather from the stunning silence that the new look for the INCOSE UK Newsletter has met with your approval! If you have any comments please send them to us to help improve YOUR newsletter. We are also looking for contributions from you, the systems engineering community,

to share with your colleagues.

Included in this edition is a book review by Peter Lister. If you are interested in reviewing new publications, please send them to us, as we would like to keep this a regular feature.

Another new feature we would like to include is a letters page to facilitate comment and debate on systems engineering issues. For

this to work we need you to send us your comments – so please drop us a line.

Finally, don't forget the Autumn Assembly on the 10th and 11th November, we look forward to seeing you there.

Doug Cowper
(Editor of Preview)



In profile Dipesh Patel – chairman of the SEPDC



Dipesh Patel is currently a System Engineer working for Tube Lines on the Jubilee & Northern Line Upgrade Project. He has over 10 years experience on major rail renewal projects and continues to promote and develop systems engineering techniques in his current role.

“What has been your greatest challenge since taking on the role of chairman of the SEPDC?”

The Spring Symposium! I've never been involved in organising an

event as big as this. The most organising I have done are small Golf Society days for my Company! So being thrust into the arena of my peer systems engineers was initially a very daunting prospect, as they can be a very demanding lot! Luckily my predecessor, David Wright, had provided me with excellent handover notes and some useful advice. I can only hope to maintain the high standards set by him.

“How do you see INCOSE UK adding value to its individual and corporate members?”

To be totally honest, before I took on the role of SEPDC chair, I used to come to INCOSE events, because I considered it to be my 'home'. Having worked in an environment where systems engineering is still young (Rail) and as a systems engineer being constantly asked, 'What DO you do?', I found it refreshing to be amongst like minded people who understood my professional 'language'. The other aspect I found valuable were the networking opportunities and sharing ideas with people from various industries which provided me with rich information for me to take back.

I hope INCOSE continues to build on the solid foundation and provides a home for members to air their views and ideas and share knowledge.

“What INCOSE UK working groups would you like to see being set up and why?”

Let's face it, the working groups have died a death in recent times, mainly because volunteers who organised them moved on and no one took on the responsibility to carry on. The biggest challenge to forming working groups has been to find willing volunteers to run them and to ensure continuity. I would like to see local regional working groups set up to cascade information and strongly supported by the INCOSE UK board. The latter is very important in encouraging willing volunteers and providing guidance and contacts to ensure a high quality of presenters and discussion topics. This I am sure will not only sustain interest but will attract new members.

I would also like to see the discussion topics relate more to the systems engineering techniques applied and the

lessons learned from them. It is all too easy for the working groups to develop into technically specialised 'talk-shops', which may put the vast majority off. These are the challenges facing us and we aim to tackle them a step at a time. It will take a little time and a lot of effort, but the results will drive us forward.

“How are you going to encourage more members to get involved with working groups, regional activities and main INCOSE UK events?”

I am a firm believer in good communication. One of my tasks would be to improve the level of awareness to members and promote services that INCOSE UK offers. A lot of the time members complain that 'they didn't know about such and such event / working group'. We want to inform members quickly and concisely. Of course, we would like the members to participate also, by informing us of new developments, encouraging others to attend working group meetings. After all they are INCOSE!

In profile next time, Paul Davies - president of INCOSE UK

President's corner



The other night, Peter Lister, Mark Irving and I had a meeting to discuss what we were going to present at the Autumn Assembly. We met in a curry house in Birmingham and, perhaps unusually, no alcohol was involved. The restaurant had apparently bought the premises next door, and their licence application had not yet been approved. Since the purpose of the licensing laws is, I thought, to evaluate the impact to the neighbourhood, which clearly hadn't changed, this sounded like a systems failure to me.

This became a common theme of the evening. We exchanged stories of how one industry lived

with disastrous consequences (in financial or timescale terms) of slavishly applying systems engineering with no common sense, whilst another applied loads of common sense at a local level, no SE to build it up to a global project, and everything falls apart. So what are we saying? It boils down to being able to spot the 'essence' of good systems engineering when you see it, but that the real skill is in tailoring the essential principles into practices relevant to the current situation. This typically requires deep understanding of the problem domain as well as the SE principles, which is why the typical response of throwing outside consultants at the problem typically doesn't work.

So can these essential principles, or core competencies, be identified, codified, and taught? Even more importantly, can the 'common sense' to know when and how to apply them, be taught? And can we reach out to the domain experts to teach it to them? I am hoping to make some

inroads into these questions at the Autumn Assembly, and following on from this in the UKAB-sponsored working group on teaching of SE to undergraduates. Doug Cowper and Dipesh Patel are always on the lookout for volunteers for this, and for the working group we would like to start on the codification of those elusive Core Competencies.

Speaking of the UKAB, I am delighted to announce that two new members have signed up – EADS Astrium and General Dynamics UK. My thanks to both companies, we are looking forward to working with them, and the strengthening of the Working Group efforts.

Finally, one more word on Core Competencies. INCOSE have proposed a way forward in 'Certification' of systems engineers – note, NOT Chartering – based partly on an examination on the contents of the Systems Engineering Handbook (<http://66.34.135.97/membersonly>)

2004/sehandbook/index.htm). 97% of the exam is based on this, with only 3% on ISO15288 and nothing on anything else. Admittedly there are other criteria for certification, like personal recommendations and interviews, but 97%? It's a worthy tome, but its section on validation and verification is sketchy to say the least. This too will be debated at the Autumn Assembly, so, please everybody, have a look at the reports on Certification on the website, and the SE Handbook itself, and come armed not only with an opinion, but a positive suggestion about what we should do!

Paul Davies
President of the UK Chapter

International symposium 2004 - call for papers, tutorials and panels



The 14th annual International Symposium of INCOSE will be combined with the 4th European Systems Engineering Conference and hosted by AFIS and the Region III Chapters in the **Pierre Baudis Congress Centre, Toulouse, France on the 20th to 24th June 2004.**

The Symposium theme is **"Systems Engineering, Managing Complexity and Change"** and focuses on higher-level complex Systems Engineering design and constant technological changes. INCOSE are looking for papers that can demonstrate how Systems Engineering can mitigate the effects of complexity and change (including case studies, technical analysis and developmental work), tutorials that can assist delegates with these issues, and panels focusing the debate on the management of complexity and change.

Special areas of interest for the Symposium include, but are not limited to:

- **Complexity and Change – SE applications today** – How does systems complexity affect the practice of SE in different appli-

cation areas, and how do organisations apply SE in their change programmes?

- **Integrated Disciplines and Technology** – How is information technology / knowledge management linked to SE? Is integration the only task for the Systems Engineers?
- **Future Trends and Predictions in SE** – Can experience from today enable needs for the future of how SE should impact improvements in organisational change programmes and technology? Do we see new areas of applied SE emerging?
- **SE Education and Research** – Is teaching SE a complex task? What are the ongoing research programmes within SE, and what have we learned from the past years?
- **Diversity of SE in Distributed and Multicultural Environments** – How do multinational / multi linguistic companies cope with SE? Do cultural differences around the world affect the application and added value of SE?
- **SE Lifecycle Processes and Systems Effectiveness** – How is

Integrated Logistic Support / Acquisition Logistics integrated with SE? How have the new lifecycle and SE standards proved useful?

Important Dates:

Panel Proposals Due:
Monday 8th December 2003

Draft Paper Submissions:
Monday 17th November 2003

Panel Acceptance Notification:
Friday 14th February 2004

Paper Acceptance Notification:
Friday 14th February 2004

Panel Final Position Statements:
Friday 19th March 2004

Final Papers Due:
Friday 19th March 2004

Tutorial Proposals Due:
Monday 13th October 2003

Selection Notification:
Friday 21st November 2003

Tutorial Agreement Signed:
Friday 9th January 2004

For those of you who do not speak French, don't worry, the official language of the event is English. However, don't let that put you off practicing your French and taking in some of the wonderful French culture to be

found in Toulouse!

More information are available at the INCOSE 2004 Symposium website:

www.incose.org/symp2004/ .
Alternatively contact:

Terje Fossnes (Technical Chair)
Tel: +47 918 76 849
Email: tefossne@online.no

Michel Galinier (Technical Co-chair)
Tel: +33 6 7509 1638
Email: mi-chel.galinier@thalesgroup.com

Jakob Kagan (Panel Chair)
Tel: +972 89272562
Email: jakagan@zahav.net.il

Wim van Leeuwen (Tutorial Chair)
Tel: +31 6 5121 0121
Email: ir.w.van.leeuwen@planet.nl
Please send all proposals to:

Christines Kowalski,
Professional Conference Management Inc.,
7916 Convoy Court,
San Diego, CA 92111, USA
Tel: +1 858 565 9921
Fax: +1 858 565 9954
Email: in-cose@pcmisandiego.com

Book review

New books for systems engineers

Implementing and Integrating Product Data Management and Software Configuration Management
ISBN 1-58053-498-8
Ivica Crnkovic
Ulf Asklund
Annita Persson Dahlqvist
Published by Artech House
(www.artechhouse.co.uk) at £61.

It is possible to leave Configuration Management (CM) and Product Data Management (PDM) to the production engineers, but it is an inescapable fact that the System Designer needs to be CM savvy. There are three reasons for this; firstly, in defining the system architecture Systems Engineers create the outline system configuration. The second is that Systems Engineers are responsi-

ble for the generation of much of the first tier of documentation and the requirements that form the upper slopes of the Product Data mountain. Thirdly, SE competences are ideally suited to defining the processes and structures involved in the application and configuration of CM and PDM.

On my most recent foray into the CM world I tracked down some papers by Ivica Crnkovic and his colleagues on the Internet and found them most useful. Soon after this I was approached by Artech House to review this book during its production. I agreed because I was interested to see whether the author would be able to make sense of the sometimes confusing world of CM, PDM, SCM, DM etc. etc. Given the author's academic credentials I was a little concerned that the book might turn out to have an academic slant. I needn't have worried because this is an intensely practical book. It will be very useful to anyone trying to

understand PDM and SCM systems – whether new to the subject, or as a customer or procurer for a new system. Given the immense range of tools in the market place, anyone involved in PDM or SCM tool procurement or integration must be an "intelligent" customer, and this book provides a comprehensive grounding in all the major issues involved.

The first section of the book describes the complex manufacturing environment that has led to the need for PDM and describes the essential features of PDM and SCM systems. This ensures that those new to the subject are given a good grounding, and those that are already aware are introduced to the concepts and terminology that will be used later in the book.

Things start to get really interesting when the similarities and differences between PDM and SCM are examined in the second section. There are many who see them as providing essentially the same functions, whereas in fact there are key

Advertise in pre VIEW

If you are looking to contact the Systems Engineering Community in the UK, why not place an advertisement in preview?

For more information about our competitive rates please contact:

Guy Tugwell on 01792 417227
or
email: guy@brass-bullet.co.uk

alternatively contact:

John Mead on 01344 422325
or
email: john.mead9@ntlworld.com

differences that need to be recognised. As described in later chapters, it is feasible to extend the use of SCM tools to provide PDM functions, but the user must be aware of what functionality is being lost or compromised.

The next part of the book deals with the complexity of tool selec-

tion, deployment and integration. Much of this part is also text book guide for the introduction of any complex engineering tool. A major issue addressed by this section is the consideration of the organisation that is using PDM/SCM. This is a subject where one size definitely does not fit all. There are a number of options posed for integrating PDM and SCM – and yes, you probably do need both unless your hardware content is minimal.

At the core of the book are six case studies which manage to cover a broad range of applications and solutions. These help to crystallise the advice and information provided in the book so far. Most readers should be able to empathise with at least some of the situations described. There are also some extremely important messages about the nature of process development and improvement. None of the case studies shows a "finished" process or tool environment. All of the companies described are working under the usual constraints of having to do business profitably whether or not their PDM/SCM processes are 100% ideal.

All recognise that process development is continuous.

Finally, the book is rounded off by a comprehensive Tools and Standards survey. This information alone would justify the purchase of the book because I know from personal experience that it would take several days of Internet surfing to construct an equivalent list. Armed with the knowledge provided by the book it is also possible to make an intelligent assessment of the products on offer, rather than become bewildered by the choice available.

All in all it is a definite Ronsaal book – it does exactly what it says on the tin (or rather cover!). If you want to know about PDM or SCM then it's the book for you.

Also published recently by Artech House is *Advanced Systems Thinking in Engineering Management* (ISBN 1-58053-619-0 price £62) by INCOSE's very own Derek Hitchins. I have not seen the complete book yet, but it is clear from the resume of the contents that this is effectively the complete works of Hitchins. If you have seen and enjoyed any of Derek's presentations then

you will enjoy this book. With an endorsement from John Snoderly, President of INCOSE, you don't need to take my word that this is a book that every Systems Engineer should have.

There isn't anything similar on the market – if there was I would have a copy. The weakness of existing texts is that they tend to be firmly based in the conventional engineering side of SE, and thus ignore the wider aspects of systems thinking and theory. Derek's approach has always been to identify the principles behind the practice, making for a much more powerful message. If you are looking for the nuts and bolts of how to manage requirements or design an architecture, then there are other books. If you want to know why you are doing these things (and why you are probably doing them ineffectively), then you need a book like this.

While you are making your mind up, I am off to order my copy. I will report back in more detail when I have had a chance to read it.

Pete Lister
Siemens Transportation Systems Ltd

The UML™ for systems engineering initiative

This is the first in a series of articles on the Systems Engineering for UML Consortium, (SysML). This article will give the background to SysML and its goals and guidelines. Future articles will look at specific areas and review projected changes to UML to support Systems Engineering.

Overview

The UML has, since its adoption in 1997, proved immensely popular with software engineers to the point where it is now the only widely used visual modelling language for software engineering. In the past, UML's software focus has discouraged many system engineers from adopting it in earnest. However, many Systems Engineers believed the UML to be sufficiently flexible and robust to support extensions to address the needs of systems engineering. One of the strengths of UML is its built-in mechanisms for specializing the generic forms of its modelling elements to more application-specific variants. Collectively, these provide a capability for UML "Profiles" that package specific terminology and substructures for a particular application domain. Exploiting this has the potential to achieve a "standard modelling language for systems engineering to analyse, specify, design, and verify complex systems, intended to enhance systems quality, improve the ability to exchange systems engineering information amongst tools, and help bridge the semantic gap between systems, software, and other engineering disciplines." (www.omg.org)

Consequently, the decision was made by the Object Management Group (OMG) to pursue UML for systems engineering. This was made following a series of

discussions at the INCOSE International Workshop in January 2001. Dave Oliver represented INCOSE at the OMG Technical meeting in July '2001, to initiate a liaison with the OMG to support the evolution of UML for Systems Engineering. At the meeting, the Memorandum of Understanding between OMG and INCOSE was signed, and the Systems Engineering Domains Special Interest Group (SE DSIG) was chartered with Sanford Friedenthal as the chair. The SE DSIG kickoff meeting was held on September 13, 2001 in Toronto.

In March 2003, the OMG issued a Request for Proposal (RfP) for a customized version of UML suitable for Systems Engineering written by the SE DSIG. Here's part of the introduction to the RfP:

"This Request for Proposal solicits submissions that specify a customization of UML™ for Systems Engineering (SE). The customization of UML for systems engineering is intended to support modeling of a broad range of systems, which may include hardware, software, data, personnel, procedures, and facilities.

The customization of UML for SE should support the analysis, specification, design, and verification of complex systems by:

- capturing the systems information in a precise and efficient manner that enables it to be integrated and reused in a wider context
- analyzing and evaluating the system being specified, to identify and resolve system requirements and design issues, and to support trade-offs
- communicating systems information correctly and consistently among various stake-

holders and participants"

Now, five months after issue, it looks likely that there will be only one technology submission, called SysML. The SysML consortium (www.sysml.org) has a broad range of members, including system engineers, tool vendors, government organizations and academic institutions. ARTISAN Soft-

ware Tools is an active member of the SysML consortium.

The UML for SE initiative is a very important step forward in persuading system engineers to use UML and the timetable for adoption of UML for SE is correspondingly aggressive:

Event or Activity	Actual Date
Platform Technical Committee (PTC) votes to issue RFP	March 28, 2003
Letter of Intent (LOI) to submit to RFP due	September 8, 2003
Initial Submissions due and placed on OMG document server ("Three week rule")	October 27, 2003
Voter registration closes	November 17, 2003
Initial Submission presentations	November 2003 meeting
Preliminary evaluation by Analysis and Design Task Force (ADTF)	November 2003 meeting
Revised Submissions due and placed on OMG document server ("Three week rule")	March 29, 2004
Revised Submission presentations	April 2004 meeting
Final evaluation and selection by ADTF	June 2004 meeting
Recommendation to Architecture Board (AB) and PTC	
Approval by AB	June 2004 meeting
Review by PTC	
PTC votes to recommend specification	June 2004 meeting
Board of Directors votes to adopt specification	August 2004

The UML for SE specification will include standard UML diagrams with applicable extensions for UML for SE, and other diagram types as needed. One example is the System Context Diagram, which includes a depiction of the input/output flow between the system and/or components, and the elements in its environment. Artisan has argued for many years that this diagram is essential to good Systems Engineering, and indeed has been

available in its tool, Real-time Studio for the past 5 years. Other models include, parametric models, requirements relationships, causal analysis, verification models, and decision trees. Finally, it has become clear that many of the key requirements of the RFP, will be far more easily met using UML 2.0 rather than UML 1.5 as a basis. For example, structure diagrams and the sequence dia-

gram extensions.

My experience of the SysML consortium and its members makes me very confident that our submission, when adopted as a standard by the OMG, will facilitate the rapid uptake of UML by the majority of the systems engineering community. However, it should be noted that systems engineers in many organisations are already using UML 1.X to

great effect and that if you are already thinking about adopting UML you don't necessarily need delay adoption until the standard emerges in 2004.

If you have any questions, please feel free to email me at MatthewH@Artisansw.com. More information on SysML in general can be found at www.sysml.org.

Matthew Hause
ARTISAN Software Ltd.

London software systems research institute

London Software Systems is a major new research institute jointly established by Imperial College and UCL. It will focus on techniques and tools for designing large-scale complex information technology systems. It will do so in the context of a broad systems engineering orientation.

Both Imperial College and UCL have research groups of outstanding international quality in the area of software systems engineering. The groups - the Imperial Col-

'The shared research approach is driven by case studies combined with rigorous analysis and validated in practice through collaboration and consultancy with industry.'

lege, Distributed Software Engineering group (about 30 people, including academics, research assistants and research students) and the UCL Software Systems Engineering group (about 35 people, people including academics, research assistants and research students) - have a long track record of collaboration and intellectual exchange.

This track record is founded upon a shared intellectual focus on engineering solutions which are lightweight, and are carefully targeted towards "real" industrial problems. This is supported by the development of prototype tools, which may include components from other groups and exploit emerging standards. These tools are made available to industrial and academic users for evaluation.

The shared research approach is driven by case studies combined with rigorous analysis and validated in practice through collaboration and consultancy with industry. LSS is particularly aware of the need for software systems engineering techniques, methods and tools to scale and to be simple enough that they can be adopted in practice.

LSS will have a specialisation in the principled construction of

large-scale potentially mobile, distributed systems and in the provision of infrastructure to support change, evolution and management in systems that may also have stringent quality-of-service requirements. The constituent groups have a strong background in formal analysis and the development of tools and environments to support this. They have experience in developing tools for deployment and management of large-scale distributed systems across complex networks.

The work links at one end to the strong Imperial College tradition of work on theory and formal methods as well as distributed programming environments and at the other end to the strong UCL tradition of work on networks and communications.

The context of software system development is changing. Systems are rarely developed from scratch; most system development involves extension of pre-existing systems and integration with 'legacy' infrastructure. These systems are embedded in complex, highly dynamic, decentralised organisations; they are required to support business and industrial processes that are continually reorganised to meet changing consumer demands and may have stringent quality of service and dependability requirements. The services that such a system provides must, for the life of the system, satisfy the requirements of a diverse and shifting group of stakeholders. There is a shift towards client and user centred approaches to development and an accompanying shift from a concern with whether a system will work towards how well it will work. Overall, fewer 'bespoke' software systems are being constructed. Instead, generic components are built to sell into markets. Components are selected and purchased 'off the shelf' with development effort being refocused on configuration and interoperability. The resulting

systems are composed from autonomous, locally managed, heterogeneous components, which are required to cooperate to provide complex services. They are, in general, distributed and have significant quality-of-service constraints on their operation.

In this context the most pressing problem is the 'rigidity' of software systems set against the 'changeability' of the environment in which these systems must operate. This changeability ranges from context changes in mobile systems, at one end of the spectrum, to gross requirement changes, at the other end of the spectrum. The behaviour we require from the software systems in response to such changes is dependability and autonomous adaptation that preserves the desired system properties. For each position in the spectrum there are proposals or 'point' technological solutions but there has been no consistent or coherent attack on this problem. This constitutes the principal agenda item for LSS.

Software systems engineering research is often best conducted in the context of the particular demands of challenging application domains. Such domains keep research 'grounded'. Areas in which the problems above are particularly evident and in which the groups have developed some expertise as well as application partnerships are transport, medicine, telecommunications and finance. Each domain has a set of common problems but also distinctive features. All can strongly build on interdisciplinary linkages within Imperial College and UCL.

It is envisaged that the Institute will operate as a virtual research centre anchored by a core laboratory resource. Staff and students would normally work in the 'home institutions' and would maintain their normal obligations to their 'home departments' but would



UCL's new engineering building—home of the core LSS laboratory

spend periods working within the core laboratory facility. Such an arrangement is uniquely enabled by the physical proximity of UCL and Imperial College.

Project funding will underpin a programme of 3-6 month focused 'programmes' engaging staff and students. These programmes are expected to draw on external participants drawn from industry or from other institutions as appropriate. The programmes would employ research hot-housing in which groups of individuals are brought together to work intensively on particular topics and that 'connected time' is carved out to support this. This mode of operation anticipates the 'Isaac Newton Institute' style of visitor lead programmes.

Other activities will be: a seminar programme; a joint programme for research students, including training and supervisory support; joint hosting of academic visitors; a shared technology transfer activity, including research brokerage and open briefing programme; venture incubation; provision of a shared software infrastructure.

LSS welcomes opportunities for collaboration and cooperation. Please contact Anthony Finkelstein <a.finkelstein@cs.ucl.ac.uk> or Jeff Kramer <j.kramer@doc.ic.ac.uk>.

Prof. Anthony Finkelstein
University College London

Imperial College
London



Events calendar

October

16th October

London Region Group Meeting - rescheduled presentation by Michele Dix, Director of Congestion Charging, Transport for London

November

10th – 11th November

INCOSE UK Autumn Assembly, at the Kent Hills Hotel, Milton Keynes.

Next Year

20th – 24th June 2004

14th Annual International Symposium & 4th European Systems Engineering Conference - Toulouse, France
www.incose.org/symp2004/

If you have an event you would like published in Preview then please contact:

d.cowper@ucl.ac.uk

Remember, remember the 10th of November

Forget the gunpowder plot but don't forget the INCOSE UK Autumn Assembly on Monday 10th and Tuesday 11th November. This year's event will be held at the Kent Hills hotel in Milton Keynes (which should be easy to get to – so no excuses!) and includes:

Skills Transfer – How easy is it to transfer SE skills between different industries?

Systems Evaluation – How do Systems Engineers measure and evaluate systems

to ensure they have met performance and capability targets?

Systems Dynamics – An introduction to systems dynamics and an overview of techniques and how these may benefit systems engineering?

Hard and Soft Systems – Are 'hard' and 'soft' systems approaches just different aspects of the same tool-set?

Standards and CMMI – The latest developments in CMMI and other standards

relevant to SE process improvement. **SMART Acquisition** – Feedback on the efforts of an INCOSE-led Working Group on recommendations for improvement to the MoD's Smart Acquisition process based on an SE approach.

Core Competencies – Feedback on the INCOSE Certification programme for Systems Engineering and an exploration of how organisation's functional

structures may help or hinder the roles of a systems engineer?

Apply to John.Mead9@ntlworld.com or look for the latest details at www.incose.org.uk.

For those of you with a pile of flyers – make sure they don't clutter up your desk – send them round to your colleagues!

Your questions - answered

"It seems that the only people who are interested in Systems Engineering are engineers and project managers in engineering companies (particularly defence, transport etc.)"

Is Systems Engineering an approach to engineering or is it an approach to how you do business?

If the latter, why is it not being used more widely (or are elements of it being used under a different name)?

Perhaps elements of systems engineering needs to be rebranded and 'sold' to businessmen for it to be more widely accepted?"
ME, Woking

I think Systems Engineering is an approach to any kind of 'problem', of which engineering projects and business process are two types. What I mean by this is that in both cases there is a mental map of what's going on, and the structure of and interrelationships between the elements of each map are remarkably similar.

In the engineering case, it starts perhaps with a set of defined requirements. There is a set of available plausible solutions, a process of examination of the solutions to give a 'best' answer, and a set of phased activities put

in place to implement the design. The design is decomposed into subsystems, and we keep an eye on the interfaces between those subsystems throughout the phases. Finally we integrate all the subsystems into a whole, and prove that we've built it right and that it meets the requirements. If we're clever, we measure how well we've done it, and use the metrics to build it better, cheaper or quicker next time.

In the business example, I assert that the same process is going on in the mind of the successful Chief Executive. He (or she!) understands what his target market is, or at least funds someone to understand it for him. He knows what resources he has at his disposal, and thinks about the alternative ways he can flow work through his teams, including subcontractors, to achieve his business objectives. Very often he is concerned not with the function of each team, but with problems caused by the interfaces between them breaking down or not being managed. He will integrate his 'revenue streams', very often incrementally and measuring the effectiveness of each step. His verification and validation may be done differently (typically by auditing and by customer satisfaction surveys) but the principle is the

same. He doesn't need to be told about metrics; the business world can root out a sub-standard business process extraordinarily quickly when the balance sheet becomes affected!

So the answer to the second question is yes, it is being used under a different name – usually 'business process re-engineering'. However, as with anything else, there are good and bad ways of doing BPR, and a systems engineering approach to it is (to my mind) quite clearly better than, for example, examining current business process and simply removing *apparently* non-value-adding activities, as I have seen recommended more than once.

As to the final question, how do we re-brand SE and 'sell' it to business? Well, we've already started – look at the INCOSE Intelligent Enterprise Working Group, without wishing to plug particular companies. If we accept that half the battle in any problem to which we apply systems engineering is 'languaging the project', perhaps the right approach is *not* to call it systems engineering, but to hold that mental model and dive in? There's *money* to be

made out there! There's more than a touch of tongue-in-cheek to this answer; I would still like to dream that the business community will come to recognise the systems engineering *approach*, by name, for the benefit it brings them.

Paul Davies
UK Chapter President

If you have a question you would like answered by our panel of experts or a point of view you would like to share with Preview readers then please send to:

d.cowper@ucl.ac.uk

or write to:

Preview
c/o UCL Business
2-16 Torrington Place
London WC1E 7HN

Around the regions

London

The London Region Group (LRG) Steering Committee met at UCL on 17th September to establish the various roles and to formulate the activities for the coming year. The meeting agreed that the posts (see below) should be for 2 years rather than the 1 year suggested at an earlier LRG event and that half the posts should be up for election on alternate years to ensure continuity of the committee. These elections will take place at an AGM that will be included in one of the events.

It was suggested that there should be two types of event: a formal presentation style followed by questions and networking, and a workshop style where issues and case studies could be discussed on a more focused topic area, for example how to produce a Systems Engineering Management Plan. The formal presentations should take place once a quarter (every 3 months) and the workshops could be more ad hoc and occur between the main presentation events. It was suggested that the

first workshop should be a pilot and included as part on the main programme.

The meeting reviewed the suggested topics from the first LRG meeting and agreed the following programme:

Oct 16th
 "The Congestion Charge" Michele Dix (Transport For London) at UCL
 End Jan 04
 "Post Christmas Blues (a light hearted short presentation TBC) & AGM at UCL
 Mid April 04
 "Systems Engineering Management Plan Workshop" venue TBC
 End Jun 04
 "West Coast Main Line Requirements Case Study" Network Rail, Eversholt Street TBC
 Mid Oct 04
 "Heathrow's Terminal 5" BAA, Victoria TBC

Other suggested topics that the steering committee will explore are:

- A workshop by Praxis
- Hosting the Olympics as a logistics exercise

Other venues to be explored by the steering committee:

- The BT Tower
- The Strategic Rail Authority
- TFL in Broadway
- The IEE at Savoy Place

If you have any suggestions for topics/presentations or would like to host an event please contact any of the following LRG Steering Committee members:

Group Co-ordinator
Kuldeep Gharatya (London Underground)
 kuldeep.gharatya@thetude.com
Derek Price (Parsons Brinckerhoff Ltd) priced@pbworld.com

Meeting Organiser
Doug Cowper (University College London) d.cowper@ucl.ac.uk

Deputy Meeting Organiser
Dipesh Patel (Tube Lines Ltd)
 dipesh.patel@tubelines.com
Kevin Tarling (Parsons Brinckerhoff Ltd)
 kevin.tarling@networkrail.co.uk

Communications
Margaret Myers (American International University in London)
 m@margaretmyers.com

IEE Liaison
 Mike Hayward (Carl Bro Ltd)
 mike.hayward@carlbro.com

Don't forget the next LRG event is the postponed presentation from July by Michele Dix, Director of Congestion Charging, Transport for London, to be held on the 16th October at 17:30 in the Haldane Room of University College London

Doug Cowper
 University College London
 Centre for Systems Engineering

Stevenage



The inaugural meeting of the Stevenage group took place at EADS Astrium on Wednesday the 10th September. The group, whose target audience, are those in the northern Home Counties, primarily Hertfordshire, Bedfordshire, Buckinghamshire and Cambridgeshire got off to a great start with around 70 people attending, some of you came from a far a field as Portsmouth and Basildon. This was a few more than expected and caused me the slight inconvenience of having to ask site services for another twenty chairs, I suppose that'll cost me another beer or two. It was encouraging to see that a high percentage of the attendees were not INCOSE members, some of you must have been out there actively advertising the event, many thanks for that. We had 15 application forms for INCOSE membership taken on the evening. Hopefully John Mead will soon be adding those names to the membership list.

The main speaker was Dr Jim Clemmet whose talk on BEAGLE 2 was excellent and with its immanent landing on Christmas Day very much in the news. I suppose Christmas will be slightly more stressful than usual for those actively involved with the programme, I think we are all keeping our fingers crossed. I have to say it worried me a little when Jim started off with a statement to the like of "a common systems engineering process wasn't followed" I needn't have worried, the story of the BEAGLE 2 development was full of excellent systems engineering practice and shows how much can be achieved when you can bring together such a highly motivated, disciplined and professional team. The Stevenage group would like to thank Jim for an excellent talk.

Many thanks of course to all the membership who attended the event your support was most welcome and particularly to Paul Davies and Dipesh Patel who also kindly gave up there time to come and support the event and present the benefits of INCOSE. I was pleased to see that Paul was at least out of plaster and we didn't have to

carry him up the few steps and declare him as a fire risk.

The group now has a steering committee and you should starting hearing about future events in the very near future, I have to admit on the evening I was a unsure as to the groups future as very little suggestions of future events and offers of help were forthcoming, however I have received many since, I think it was just shyness on the night. Many thanks for

those who have contributed, keep them coming. The group has its own web site, its still under construction so please be patient but you can find it at <http://incoselocal.freewebsite.org> please feel free to contribute via myself at les.oliver@astrium.eads.net

Les Oliver
 Astrium.

How do you get involved with regional activity?

Are you looking to participate in local INCOSE activities?

or

Are you looking to set up a regional group?

For more information about regional activities or how to go about setting up a regional group, please contact:

John Mead on 01344 422325
 or email: john.mead@ntlworld.com

Managing the Challenges of a Complex Future –

understanding systems engineering and a systems approach to the way complex entities are formed, especially in a rapidly changing environment.



MSc in Systems Engineering Management

University College London's MSc in Systems Engineering Management is a modular based programme designed by a multi-disciplinary team of UCL academics and industry practitioners, ensuring high standards of delivery and commercial relevance. The course offers convenient modes of study and attracts individuals from a wide range of industrial backgrounds, which enriches the delegate interaction and debate.

The course offers:

- An integrated view of complex systems and the environment in which they are constructed
- A range of ideas and techniques for managing complete systems
- Systems Engineering design, modelling and verification techniques
- Supplementing and up dating your skills to ensure continuous professional development
- A good alternative to an MBA for individuals who want to keep their technical career path

Aimed at:

- Technical Project Managers
- Engineering Managers
- Engineering Team Leaders
- Engineers working on systems projects

Course Includes:

- Systems Engineering Overview
- Systems Lifecycle
- Systems Requirements
- Systems Design
- Systems Modelling
- Systems Integrity
- Project Management
- The Business Environment

To find out more visit our website at:

<http://www.syseng.ucl.ac.uk>

To obtain our brochure and application forms, and for any other enquiry please contact:

Marion Andrew,

UCL Centre for Systems Engineering, University College London,
3 Taverton Street, London, WC1E 6BT

Tel: +44 (0)20 7679 4908

E-mail: enquiries@syseng.ucl.ac.uk



Who to contact

President of the UK Chapter

Paul Davies
Technical Manager
Thales Sensors
Scudamore Road
Leicester, LE3 1UA
T: 0116 2594174
F: 0116 2876677
E: paul.davies@uk.thalesgroup.com
paul.davies@ntlworld.com

Past President and Treasurer

Peter Lister
Siemens Transportation Systems Ltd
4 Highlands Court
Cranmore Avenue
Shirley, Solihull
B90 4LE
T: 0121 7134311
F: 0121 7134360
E: peter.lister@siemens.com
peter@lister.globalnet.co.uk

President Elect

Prof Phil John
RMCS Shrivenham,
Swindon, SN6 8LA
T: 01793 783720
F: 01793 785192
E: p.john@rmcs.cranfield.ac.uk

UK Administrator

John Mead
20 Beehive Lane
Binfield
Berks. RG12 8TU
T: 01344 422325
E: john.mead9@ntlworld.com

Secretary

Allen Fairbairn
Elipsis Ltd
3 Trinity Road,
Folkstone, Kent. CT20 2RQ
T: 01303 850255
F: 01303 246265
E: allen@elipsis.com

Chairman of the SEPCD

Dipesh Patel
Tube Lines Ltd
30, The South Colonnade
Canary Wharf
London E14 5EU
T: 020 7308 3448
F: 020 7308 3402
E: Dipesh.Patel@tubelines.com

Chairman of the CMC

Guy Tugwell
Brass Bullet Ltd.
Pemchurch Chambers
30-32 Cradock Street
Swansea, SA1 3EP
T: 01792 417227
F: 01792 558729
E: guy@brass-bullet.co.uk

Academic Liaison

Doug Cowper
UCL Business, University College London
London, WC1E 7HN
T: 020 76796825
F: 020 76796508
E: d.cowper@ucl.ac.uk

Our sponsors

INCOSE UK gratefully acknowledges the commitment of its corporate members, currently these include:

Astrium, BAE SYSTEMS, General Dynamics UK, Loughborough University, Thales and University College London.

BAE SYSTEMS



GENERAL DYNAMICS
United Kingdom Ltd.