## Over 1000 Volunteers For 'Suicide' Mission To Mars

With fingers in the dike, the Dutch company Mars One is organizing a one way mission to Mars 2023. In a recent press release, they say they have over a thousand applicants already. The first four astronauts are planned to land on Mars in 2023, with four additional crew members arriving every two years thereafter. In the press release they also mention that they are now a not-for-profit Foundation. It sounds ambitious, but they have a Nobel prize winner, an astronaut, and several people from NASA on their board. Independently, when asked "Are you willing to live out your remaining years on Mars," a significant fraction of scientists older than 65 said yes! It takes too much fuel-weight to bring them back. Aprils Fools? Not!   ∞
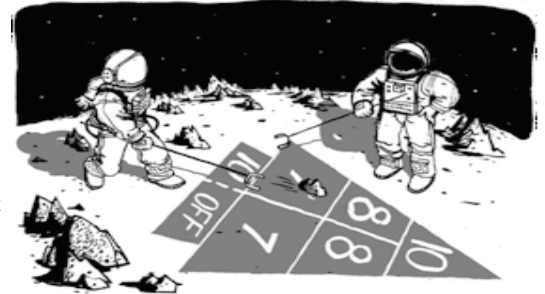
5th SE Day @ UTEP – Green Systems of Systems, 25-26 April

Hoong Yan See Tao, PhD Student, Student Chapter member

The Systems Engineering Day (SE Day) started in April 2009 under the new Systems Engineering program at The University of Texas at El Paso (UTEP) has emerged as one of the most popular programs tamong graduate students. This year, the INCOSE Enchantment chapter, through the INCOSE-UTEP student organization, is celebrating the 5th SE Day with the theme "Innovating Green Systems-of-Systems for the 21st Century." The vision for this symposium is to bring professionals, program graduates, faculty, and current and potential students to a common environment where experience, challenges, and research can be shared between the participants. This year, the 5th SE Day will be held on April 25th and 26th at the El Paso Natural Gas Conference Center at UTEP, where participants – INCOSE, UTEP, IIE, US Department of Education, Arizona University, Drexel University, Texas Manufacturing Assistance Center (TMAC), Lockheed Martin, Sandia National Laboratories, and others – will be discussing current topics in Green SoS. This is an excellent opportunity for all students to present and develop their academic skills through a research poster competition during the event. There is no cost to attend. Breakfast and lunch are included. Please register at http://imse.utep.edu/. For more information please contact us at: (915) 747-7630 or email: hsee@utep.edu or salunafong@miners.utep.edu.   ∞

State of the Chapter and Future Directions *Chapter President Ricardo Pineda, UTEP*

As President of the INCOSE-Enchantment chapter I am happy to report our chapter has been quite active and healthy during 2012 and will continue to be very active during 2013. I'd like to acknowledge and congratulate our past President Woody and all the 2012 board members for a job well done.

The current BOD had its annual retreat in Albuquerque on March 8th to update our plans and improve the service we provide to our members. Our existence is founded on your participation and cooperation. Together we create a collaborative environment addressing the challenges we face as systems engineering professionals. Will you help us in our efforts to enroll more companies, industry sectors and universities within our territory to enhance our effectiveness within the region and at the national level?

Today's virtual environments need to be exploited to our full advantage to have two-way communications channels for you to express your needs and for us to take them and define strategies to implement action plans to enhance the chapter's value proposition. One of our top priorities is the migration of our website onto a new IT platform sponsored by INCOSE central that will resolve some of the technical issues we experienced in the past. The new platform will allow us to create Enchantment's chapter interest groups to share information, and enable discussion and chats on specific topics of interest. We would also like to see chapter-sponsored local projects to drive innovation and creativity among our members. What projects would make a difference to the visibility of SE and to our region?

We have already scheduled a series of attractive meetings/webinars up to June this year (see page 3); we are considering what future meeting and tutorial topics will best benefit you as members. Think about what topics might interest you or the systems engineers in your organization enough to take time out of their busy schedule to come hear an interesting talk on the subject.

Finally, we would like to attract and retain more chapter members. Would you take a moment and share with me (ricardo.pineda@incose.org) what draws you to the chapter and how we can attract more of our colleagues? Would you be willing to invite fellow professionals to gather together, in a conference room at work or with faculty and students at a University, when attending a webinar, a chapter Live Meeting, etc.?

Please send your thoughts on areas you think are critical for the development of our members and the region. You as Enchantment chapter members are the lifeblood of INCOSE's commitment to advancing the field of Systems Engineering in our region. ∞

Common Language for Systems Praxis

From: James Martin <martinqzx@gmail.com>   Date: December 31, 2012, 4:36:31 PM EST
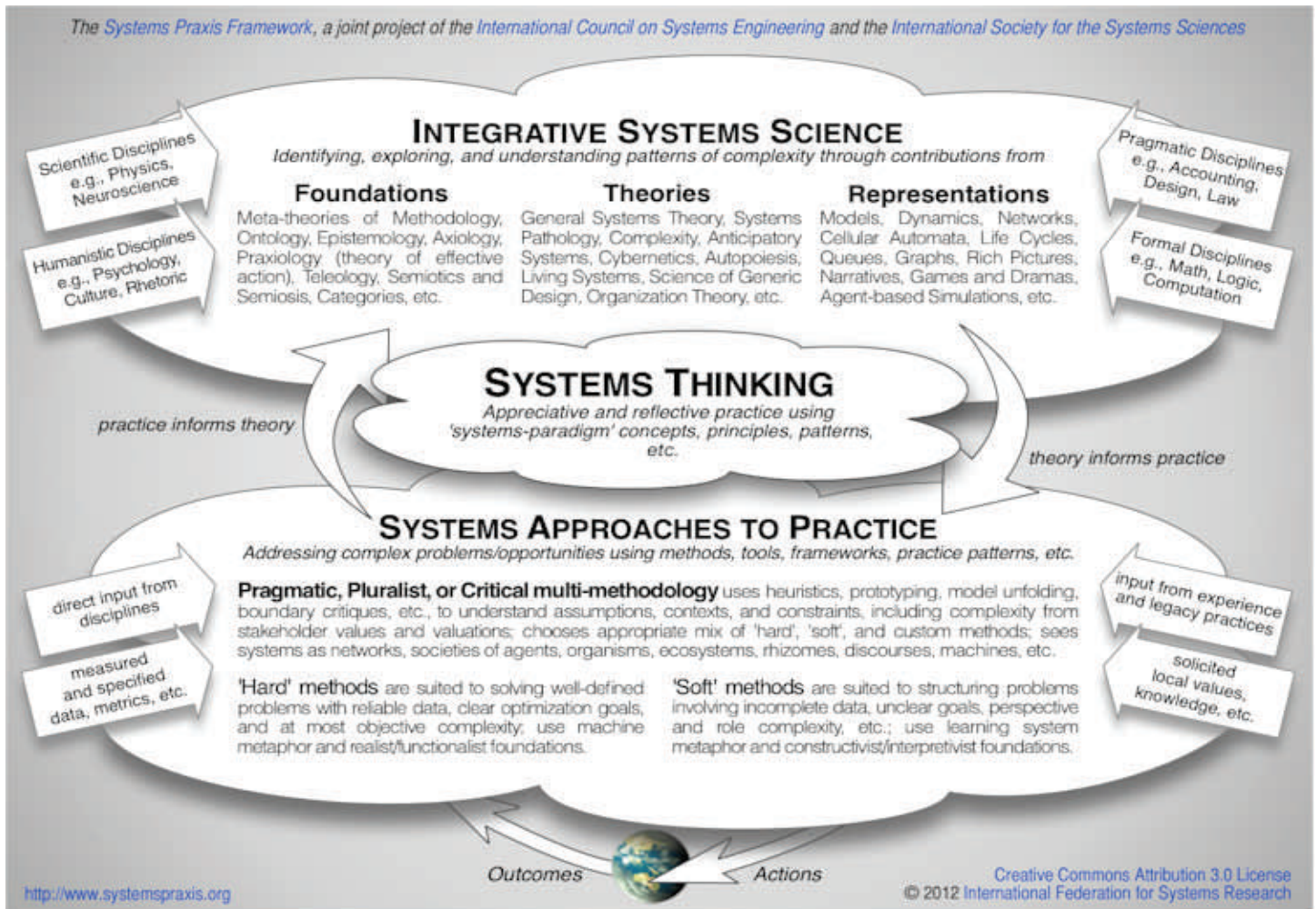To: SSWG <syssciwg@googlegroups.com>   Subject: Systems Praxis team report

A workshop was held to discuss a "Common Language for Systems Praxis." Our report is attached and can also be found at http://systemspraxis.org/syssciwg/SysPraxisRpt2012.pdf along with the report supplement (meeting notes & presentation charts) at http://systemspraxis.org/syssciwg/SysPraxisRptSupp2012.pdf.

This paper is one of several reports from the 16th IFSR Conversation held in Linz, Austria in April 2012, entitled "Systems and Science at Crossroads." The full proceedings can be found at: http://www.ifsr.org/conversations-proceedings. After the event, further development was done on a "Systems Praxis Framework," which can be found here: http://systemspraxis.org/

Report: "Towards a Common Language for Systems Praxis"

We explored developing "common language for systems praxis" to help systems theorists and systems practitioners deal with the major cross-discipline, cross-domain problems facing human society in the 21st Century. For the first three days, we explored a broad range of issues, from previous efforts at standardization; to the nature of language, culture, and praxis; to the relationship between systems science, systems thinking, and systems approaches to practice. On day 4, we used Checkland's CATWOE [defined here] approach to understand the usage, context, and constraints for any common language for systems praxis. On day 5, this checklist helped us develop a diagram showing how an integrated approach to Systems Praxis could put theories from Systems Science and Systems Thinking into action through technical Systems Engineering and social Systems Intervention.

We learned that the best medium for communication across different 'tribes' is patterns, and that a common language for systems praxis could use system patterns and praxis patterns to relate core concepts, principles, and paradigms, allowing stakeholder 'silos' to more effectively work together. We captured this vision in a diagram that provided a neutral 'map' each tribe can use to explain its own narrative, worldview, and belief system, as well as to appreciate how the various worldviews and belief systems complement and reinforce each other within systems praxis. Further development of the diagram post-conversation led to the Systems Praxis Framework (in the Addenda to this report).   ∞

The *Systems Praxis Framework*, a joint project of the *International Council on Systems Engineering* and the *International Society for the Systems Sciences*

INTEGRATIVE SYSTEMS SCIENCE
Identifying, exploring, and understanding patterns of complexity through contributions from

Scientific Disciplines e.g., Physics, Neuroscience

Humanistic Disciplines e.g., Psychology, Culture, Rhetoric

Pragmatic Disciplines e.g., Accounting, Design, Law

Formal Disciplines e.g., Math, Logic, Computation

Foundations
Meta-theories of Methodology, Ontology, Epistemology, Axiology, Praxiology (theory of effective action), Teleology, Semiotics and Semiosis, Categories, etc.

Theories
General Systems Theory, Systems Pathology, Complexity, Anticipatory Systems, Cybernetics, Autopoiesis, Living Systems, Science of Generic Design, Organization Theory, etc.

Representations
Models, Dynamics, Networks, Cellular Automata, Life Cycles, Queues, Graphs, Rich Pictures, Narratives, Games and Dramas, Agent-based Simulations, etc.

SYSTEMS THINKING
Appreciative and reflective practice using 'systems-paradigm' concepts, principles, patterns, etc.

practice informs theory

theory informs practice

SYSTEMS APPROACHES TO PRACTICE
Addressing complex problems/opportunities using methods, tools, frameworks, practice patterns, etc.

direct input from disciplines

measured and specified data, metrics, etc.

input from experience and legacy practices

solicited local values, knowledge, etc.

Pragmatic, Pluralist, or Critical multi-methodology uses heuristics, prototyping, model unfolding, boundary critiques, etc., to understand assumptions, contexts, and constraints, including complexity from stakeholder values and valuations; chooses appropriate mix of 'hard', 'soft', and custom methods; sees systems as networks, societies of agents, organisms, ecosystems, rhizomes, discourses, machines, etc.

'Hard' methods are suited to solving well-defined problems with reliable data, clear optimization goals, and at most objective complexity; use machine metaphor and realist/functionalist foundations.

'Soft' methods are suited to structuring problems involving incomplete data, unclear goals, perspective and role complexity, etc.; use learning system metaphor and constructivist/interpretivist foundations.

Outcomes   Actions

http://www.systemspraxis.org

Recent Meetings

Ann Hodges, Sandia National Labs
Available presentation slides are posted on the Enchantment Chapter website.

January 2013—Brad Rogers presented Identifying Architectural Modularity in the Smart Grid. One significant challenge facing a broader deployment of modern grid technologies is integrating with legacy systems while driving toward elegant, interoperable solutions in future grid integration efforts. Brad discussed the application of the Design Structure Matrix methodology to two publically available architecture models to demonstrate how this approach can help define smart grid architectures and to help identify architectural groupings that can lead to better modularization of smart grid systems and standardization efforts. In his presentation, he concluded that initial smart grid architectural efforts can be improved upon by identifying areas of modularity and organizing around them.

February 2013—Reports were given from the Working Group workshops, special activities, events, and other significant happenings at IW13.
- CAB, AC and America's sector presented by Ricardo Pineda.
- Competency working group presented by Thomas Humpton.
- Systems of Systems and Model-Based SE working groups presented by Amit Lopes.
- Systems Security Engineering and Agile Systems & SE working groups presented by Rick Dove.

March 2013—Dr. Heidi Hahn presented the Los Alamos National Laboratory's Enterprise Project. Heidi discussed the implementation of a commercial off-the-shelf Enterprise Resource Planning (ERP) system to replace the home-grown business computing systems in use since the early 1980's. This is a provocative case study regarding the management of project teams in which team members are, themselves, stakeholders. This presentation described the project's approach to stakeholder management for the project team, which had mixed success, discussed the theoretical underpinnings of the approaches used, and provides lessons learned for handling this class of stakeholders.   ∞

Next Meetings *Ann Hodges, Sandia National Labs*

April 10: Beyond Test and Evaluation (T&E)
   Jack Ring, INCOSE Fellow, Member of Kennen Technologies, LLC, Educe, LLC, and OntoPilot, LLC.
Abstract: The T&E currently known and practiced strives to answer the question, "Does this system meet requirements?" The advent of net-centric warfare, supply chains and autonomous vehicles has changed the game. Now stakeholders want to know, "Is that system still Fit for Purpose?" In most cases the old T&E is being conducted on these new kinds of systems. The questions are not being answered even after gross expenditure of time and money. Meanwhile, T&E community competencies have dwindled toward only instrumentation and data technicians. Also, the current resurgence of system engineering and system of systems engineering does not address the new game. This presentation will outline a new paradigm focused on System Readiness Assessment from Day 2 of a new project through Year N of the system usage/evolution cycle. It will motivate and develop a new workforce of systemists who are fluent in autonomy, context-sensitive systems and integrity assessment across heterogeneous system of systems, and who are capable of designing evaluation scenarios and composing responsive test systems and operations that reflect user-specific engagement scenarios. The new paradigm will be effective in multiple domains including defense, aviation, homeland security, industry supply chains, knowledge discovery and vetting networks and human activity systems.

May 8: Bricks for a Lean Systems Engineering Yellow Brick Road
   Ann Hodges, CSEP, Sandia National Labs, **Defense Systems and Assessments Mission Assurance**
Abstract. A Yellow Brick Road can be thought of as the fabled path to a "promised land" where achievement of hopes and dreams is highly probable. Yellow bricks highlight the appropriate road, and destination mileage and speed limit signs support progress assessment to the chosen objective. Similarly, a common systems engineering (SE) framework, properly implemented at the appropriate level of rigor, facilitates monitoring and achievement of a quality product that supports the intended mission. Bricks for a lean SE Yellow Brick Road are described. The bricks include a) using a common framework that integrates SE, project management and quality management; b) right sizing project implementation of this framework using a graded approach; c) applying the framework as early as possible; d) tailoring and waiving as needed; e) using project archetypes; and f) providing a repository that contains reusable processes, plans, templates, examples, training and associated subject matter experts.

June 12: Service Systems Engineering
   Ricardo Pineda, University of Texas at El Paso, Chair Industrial, Manufacturing & Systems Engineering
In Service Systems practice, the service value chain in terms of links among system entities is defined to co-create value and deliver high quality of service. A Service System is thus defined by its value co-creation chain in which all relevant stakeholders collaborate dynamically in real time or near-real time to deliver high quality service according to the business, service, and customer goals. This presentation discusses how SSE can help define, and discover relationships among Service System entities and addresses the service-oriented, customer-centric, holistic systems view in order to plan, design, adapt or self-adapt to co-create value. Modern service systems, which may be classified as system of systems (SoS), mandate well-defined integration and governance to link service system entities for the real-time dynamic analysis of ever-changing requirements within a Service System. We will cover SSE concepts and methodologies that can be applied across various SSE stages to describe and analyze many modern service systems for better service delivery. Issues to be addressed within SSE methodologies for global deployment of efficient world-wide service systems are discussed; as is future work required for improving current SSE methodologies.   ∞

Things Worth Hearing

Kai Krause: Software is Merely a Performance Art

www.edge.org/q2008/q08_16.html#krause

"I used to think 'Software Design' is an art form. I now believe that I was half-right: it is indeed an art, but it has a rather short half-life: *Software is merely a performance art!* A momentary flash of brilliance, doomed to be overtaken by the next wave, or maybe even by its own sequel. Eaten alive by its successors. And time...This is not to denigrate the genre of performance art: anamorphic sidewalk chalk drawings, Goldsworthy pebble piles or Norwegian carved-ice-hotels are admirable feats of human ingenuity, but they all share that ephemeral time limit: the first rain, wind or heat will dissolve the beauty, and the artist must be well aware of its fleeting glory.

"For many years I have discussed this with friends that are writers, musicians, painters and the simple truth emerged: one can still read the words, hear the music and look at the images....Their value and their appeal remains, in some cases even gain by familiarity: like a good wine it can improve over time. You can hum a tune you once liked, years later. You can read words or look at a painting from 300 years ago and still appreciate its truth and beauty today, as if brand new. Software, by that comparison, is more like Soufflé: enjoy it now, today, for tomorrow it has already collapsed on itself. Soufflé 1.1 is the thing to have, Version 2.0 is on the horizon.

"It is a simple fact: hardly any of my software even still runs at all!

Bret Victor: No More Things

http://worrydream.com/quotes/

"Interface matters to me more than anything else, and it always has. I just never realized that. I've spent a lot of time over the years desperately trying to think of a 'thing' to change the world. I now know why the search was fruitless -- things *don't* change the world. *People* change the world by using things. The focus must be on the 'using,' not the 'thing.' Now that I'm looking through the right end of the binoculars, I can see a lot more clearly, and there are projects and possibilities that genuinely interest me deeply.

Richard Hamming: On Knowing and Doing

From: The Art of Doing Science and Engineering, 1997:

"Education is what, when, and why to do things. Training is how to do it. In science, if you know what you are doing, you should not be doing it. In engineering, if you do not know what you are doing, you should not be doing it.

∞

Things Worth Knowing

Focus on training obscures failures of security design

Security guru Bruce Schneier contends that money spent on user awareness training could be better spent and that the real failings lie in security design. "The whole concept of security awareness training demonstrates how the industry has failed. We should be designing systems that won't let users choose lousy passwords and don't care what links a user clicks on," Schneier writes in a blog posted on Dark Reading. He says organizations should invest in security training for developers. He goes on, "... computer security is an abstract benefit that gets in the way of enjoying the Internet. Good practices might protect me from a theoretical attack at some time in the future, but they're a bother right now, and I have more fun things to think about. This is the same trick Facebook uses to get people to give away their privacy. No one reads through new privacy policies; it's much easier to just click OK and start chatting with your friends. In short: Security is never salient." From Slashdot 20March2013.

When the security system is the vulnerability

A sophisticated scheme to use a casino's own security systems against it has netted scammers $33 million in a high-stakes poker game after they were able to gain a crucial advantage by seeing the opposition's cards.

The team used a high-rolling accomplice from overseas who was known to spend large amounts while gambling at Australia's biggest casino, the Crown in Melbourne, according to the Herald Sun. He and his family checked into the Crown and were accommodated in one of its $30,000-a-night villas.

The player then joined a private high-stakes poker game in a private suite. At the same time, an unnamed person got access to the casino's CCTV systems in the poker room and fed the information he gleaned back to the player via a wireless link.

Over the course of eight hands the team fleeced the opposition to the tune of $33 million. From Slashdot 17March2013.

Proposal Writers Take Note

Physicist Chris Lee explains one of the toughest judgment calls scientists [and project proposers] have to make: figuring out if their crazy ideas are worth pursuing. He says:"Research takes resources. I don't mean money—all right, I do mean money—but it also requires time and people and lab space and support. There is a human and physical infrastructure that I have to make use of. I may be part of a research organization, but I have no automatic right of access to any of this infrastructure.

A project that is going to take eight years of construction work before it produces any results cannot and should not be built by a PhD student. On the other hand, a project that dries up in two years is equally bad. ... the core idea also needs to be structured so, should certain experiments not work, they still build something that can lead to experiments which do work. Or, if the cool new instrument we want to build can't measure exactly what I intended, there are other things it can measure. One of those other things must be fairly certain of success. To put it bluntly: all paths must lead to results of some form." Slashdot 17March2013.   ∞

Did You Know…

SE is Responsible for System Security?

Rick Dove, Paradigm Shift International

Systems are engineered with expectations: to provide services or carry out missions that justify the development, production, and sustainment investments. This return on investment (ROI) occurs over time. In some cases an ROI might occur with one successful mission; but more usually a period of years, often very many, is required. Value fails to occur if system life is less than required; but life time is not the only threat to value.

An enterprise investing in a system may also expect higher forms of values: competitive leadership and reputation for commercial ventures, and competitive benefit and defense for governmental organizations, maybe even more important. An enterprise may lose competitive advantage if information within or about these engineered systems is obtained by competing enterprises. System life-time, protection of critical system information, and critical assets that may be protected by a system, are under threat by competitive entities, as well as by unanticipated situational events. System security is the property that guards against and counters these threats – a purposefully engineered property that only emerges successfully from thoughtful system engineering.

Modern technology is both the enabler of remarkable system capability as well as constantly-evolving adversarial attack. Increasing use, knowledge, and complexity of digital data, control systems, and communication networks compel both new system capability and new vectors for system compromise. Accessibility to technologies such as GPS, drones, and biological intervention bring new capability to physical system intervention. Globalism and outsourcing have made supply-chain insertion a successful new vector of system intervention. And enduring human factors of selfish motivation, ideological motivation, and occasional faculty impairment make the insider threat always likely and multidimensional.

So called fourth-generation warfare is characterized as relatively small guerilla group activity, and fifth generation warfare is characterized as super-empowered individuals. Both leverage newly affordable technology to non-conventional advantage – and though warfare conjures up attacks on nation states by nation states, warfare encompasses undesirable intervention directed at any entity, from a concerted effort to gain advantage on a commercial competitor to an individual's revenge against a perceived injustice. But affordability is relative. With high stakes, the resources applied by organized crime and nation states are less constrained, with access to the brightest of minds and the most sophisticated technologies.

Within the systems engineering taxonomy, security is classified as a specialty engineering activity. To be sure, very special knowledge, experience, and practice are necessary in system security engineering; especially when systems of all kinds are targets for intelligent, resourceful adversaries intent on system compromise. Security engineering is engaged to make a system secure, but too often this engagement is constrained by the nature of an already defined and often implemented system, or limited to ensuring that called-for standards and regulations are met. Both types of engagement hamstring the ability of security engineering to accept and dispatch system security responsibility.

System engineering is described and practiced as a collection of technical and project processes, organized for disciplined execution, with checks and balances throughout – in prudent practice. At the highest level the technical process of Verification and Validation, with test and evaluation, is focused on verifying that the system meets requirements and that the requirements are valid for meeting the system intent. Within each of the system engineering processes there are also formal internal checks and balances, called out to ensure the integrity of each process discipline.

Verifying and validating sustainable security of a system reaches back to the earliest two system engineering processes of Stake Holder Requirements Definition and Requirements Analysis; where requirements and the concept of operations govern what will be verified and validated for system security. Important outputs of the Requirements Analysis relevant for system security include Measures of Performance, Systems Functions, and Verification Criteria. Systems functionality should not ignore those functions that are intended to provide sustainable system security, nor can dedicated system security functions preclude the need for all other functions to include appropriate internally-integrated security measures. The expertise for integrating sustainable security in the processes of Stake Holder Requirements Definition and Requirements Analysis is best provided by the specialty engineering resources of security engineering as full peers.

In each of the system engineering technical processes, disciplined checks and balances are included to ensure process integrity. Each of these processes will enable and/or constrain the end capability of sustainable system security; and thus warrants explicit call out in the process definition, and collaboration with the expertise of actively engaged security engineering resources.

Tradeoff evaluation and decision are important functions of system engineering, and system security is not immune; but these evaluations and decisions should be informed and advised by the expertise of competent and thoughtful security engineering resources. Competence is rooted in depth of specialty knowledge, whereas thoughtfulness is enabled by breadth of full system's requirements and intent knowledge.

Fielding sustainably secure systems today is critical to enterprise needs, yet difficult when system security is less than a paramount thoughtful concern of the system engineering processes. Responsibility lies with both acquirer and supplier.

"Large increases in cost with questionable increases in performance can be tolerated only in race horses and fancy women [and computer security]". Lord Kelvin – with bracketed addendum added by David Evans, 25 May 2011, A Research Agenda for Scientific Foundations of Security, IEEE Symposium on Security and Privacy, 22-25 May 2011 Oakland 2011.

∞

Resources

Successful No-Hierarchy Company: Podcast with **Yanis Varoufakis** economist-in-residence at Valve Software talks about the unusual structure of the workplace at Valve, where teams of software designers join spontaneously to create and ship video games without any top-down supervision. Related: How does Valve's management structure fit into today's corporate world? and Valve Software Employee Handbook.

Andreas Raptopoulos is CEO of Matternet, building a network of unmanned aerial vehicles (UAVs) to transport medicine and goods in places with poor road infrastructure. Watch here.

John Robb thinks the Matternet concept will become an urban package delivery system modeled on Internet packet delivery. Jump in the middle of the blog series on this concept, with the focus on how it gets built.

And for something completely different, a quadrotor at home in the air and on the ground. Watch here.

∞
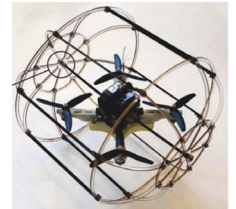
New Chapter members

Francis Peter, Management Sciences

Enchantment Chapter now has 98 active members. We would like to welcome the following new INCOSE members to Enchantment Chapter:

Gregory Chavez	Los Alamos National Laboratory
Grace E. Thompson	Sandia National Laboratories
Francisco Zapata	University of Texas at El Paso - RIMES

The Enchantment sponsored Student Chapter of the University of Texas at El Paso currently has 6 active members. We welcome the following new student members:

Saran Bhagavathula
Sergio Luna
Hoong Yan See Tao

∞

Connect to Your Community of Practice

Chapter meetings with a focus on systems engineering are held monthly on the second Wednesday, except in December. The December meeting is an annual social event, with mingling, dinner, and a speaker chosen for enjoyment by systems engineers and guests alike.

Monthly meetings feature speakers from out-of-town that are visiting the area for other reasons, and local (more or less) subject matter experts on topics of relevance.

On occasion special facility tours are arranged, sometimes as the monthly meeting, and other times on a separate schedule.

Chapter meetings begin at 4:45 pm. After chapter news, announcements and introductions, the presentation and discussion generally lasts until 6:00 pm, carried on Live Meeting for chapter members who can't attend. Recordings are not made.

Tutorials with in-depth coverage on topics of interest are arranged approximately twice a year. Delivered by experts in the field, tutorials range from 1/2 day to day+ durations, and generally involve a tuition.

Mix with people who have the same professional interests as you do, but with a diversity of perspective beyond daily workmates. It comes in handy when you need help or answers to questions outside your accumulated experience, need a connection at another organization, or simply want some mind stretching thought.

Meeting and event notices routinely go to all INCOSE members within the Chapter's geographic territory; but Live Meeting connections, special notices, and collaborative opportunities are generally limited to registered Chapter members. Obtain chapter membership on the INCOSE web site by changing your profile or selecting Enchantment Chapter as you renew membership. ∞

Chapter Board

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