

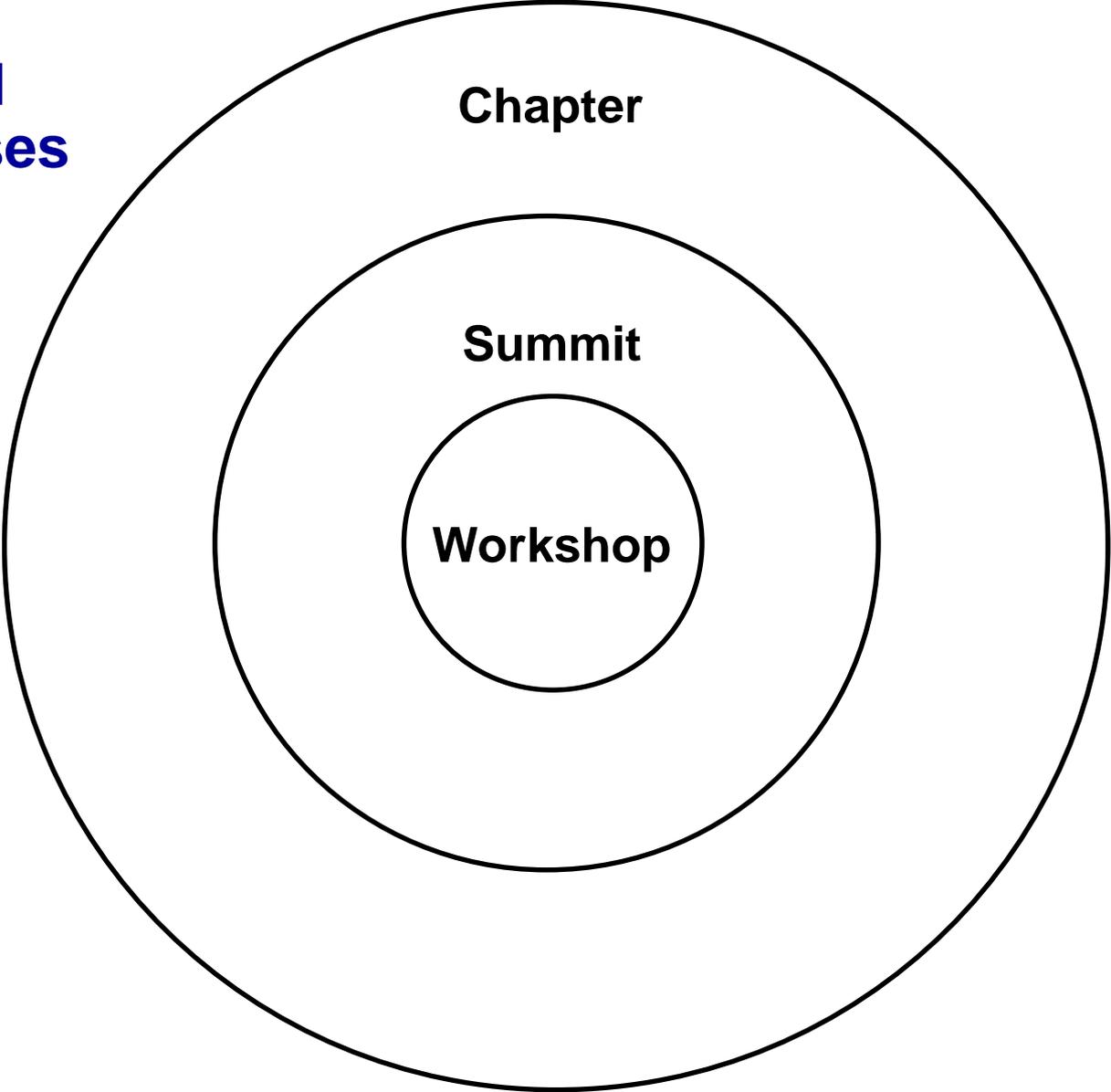
Systems Summit ConOps for Chapter Use – By Example

**Rick Dove. 2017. IW17 Joint Workshop by
Agile Systems & SE and Systems Science Working Groups, Torrance, CA, 31 Jan.**

**The material here was developed by the Enchantment Chapter in collaboration
with the Agile Systems & Systems Engineering WG**

Context

Nested Enterprises



Enchantment Chapter as Enterprise

Vision: a concise future state or goal.

- Organizational encouragement of employee membership.
- Membership utilization for professional development.

Mission: simple repeatable rules that lead to the vision.

- Rule 1: Provide valued services for member professional development.
- Rule 2: Engage previously unengaged members.
- Rule 3: Broaden awareness of Chapter value to the community.
- Rule 4: Attract new members.

Culture: shared mental models that support the mission

- Everybody gets a personal sense of reward in contributing to the mission.
- Everybody has a voice that is heard and appreciated.
- Everybody comes to learn and improve Chapter effectiveness.

Learning: incremental improvement of the culture and mission.

- Experiment with, evaluate, and evolve Chapter services.
- Experiment with, evaluate, and evolve operating processes.

Framework per Derek and Laura Cabrera, Systems Thinking Made Simple

Summit Concept as Chapter Enterprise

Vision

- Infrastructure that enables and facilitates collaborative knowledge exchange leading to new actionable understandings.
- Professional development through knowledge exposure, assimilation, and utilization.

Mission:

- Rule 1: Ascertain engaging topics-of-interest insufficiently understood.
- Rule 2: Provide engaging means to participate.
- Rule 3: Provide affordable means to engage (time and cost).
- Rule 4: Create a valued (awesome) experience for everybody involved.

Culture:

- Vision leadership (centralized initially, acculturated eventually).
- Mission-engaged event-development and production team.

Learning:

- Open-ended process-evaluation retrospective.
- Lessons-learned articulated, assimilated, mitigated.

Topic-Workshop as Enterprise

Vision:

- **An embraceable problem understanding that illuminates a compelling solution-requirements path to entice collaborative solution investigation.**

Mission:

- **Rule 1: Articulate a bounded unresolved problem concisely.**
- **Rule 2: Identify multi-perspective organizational and cultural impediments to recognizing the problem as one in need of attention and solution.**
- **Rule 3: Concisely articulate a broadly embraceable value proposition for solving the problem.**
- **Rule 4: Converge on broadly acceptable requirements for an embraceable solution.**
- **Rule 5: Decide on collaborative action to work on a solution.**

Culture:

- **Everybody has a voice and perspective that is heard and appreciated.**
- **Welcoming to all levels of experience (students to elders).**
- **Everybody engages as a team on a mission.**
- **Moderator is there to moderate toward mission (not to pontificate).**

Learning:

- **Real-time evaluation of mission achievement.**
- **Real-time evaluation of cultural achievement.**

Why Call it a Summit?

Traditional roots of a forum called a Summit refer to:

- **A conference or meeting of high-level leaders, usually called to shape a program of action.**
- **Direct personal negotiations between heads of governments.**

Implicit is the recognition that a Summit is a meeting of peers. None have the power to impose self-serving values on the others.

In our context:

A “leader” is simply someone who has the desire and drive to make something happen – by enabling, facilitating, and enticing others to engage in achieving a compelling vision and mission. This characterizes the desired participant.

“Negotiations” recognize that the needs of others must be understood – because this provides a core that can leverage the force of others. This characterizes the operable culture.

“Shape a program of action” recognizes that an actionable outcome is the reward for participation. This characterizes the intent.

Topic Selection Process

Chapter board members did one-on-one interviews at Sandia, Los Alamos, Honeywell, AFRL, White Sands, ATA, UTEP, NMTech with multiple management personnel to develop the list of 16 topic candidates, in June/July/August.

18 Membership-Survey Respondents, rating 1-5	Interest 4&5	Weighted Avg
Systems Engineering Cultural Transformation	15	75
SE as multidiscipline enabler, art, and science	14	71
High Performance Teaming	11	68
Systems of Systems evolutionary integrity	11	65
Fail-fast rapid innovation concepts	11	64
Agile security adaptable to adversary attack	10	65
Agile hardware-development infrastructure	9	63
Organizational teaming for joint project pursuit	9	61
----- Cut Line -----		
Critical infrastructure resilience	10	60
Design concepts of user-embraceable systems	10	58
Meaningful customer involvement	9	57
Integration in large-scale systems for up-grades	8	54
IPT support infrastructure	6	50
T&E for unmanned and autonomous systems	8	46
Sub-contractors as fully engaged team members	5	41
High-value relationships with academic institutions	4	41



We Need Your Help to Make This Workshop Valuable to You

The Enchantment Chapter has a mission to support regional Systems Engineering needs and membership professional development and engagement. Underway is planning for a Systems Engineering 2-day multi-workshop event for this fall.

These workshops will not be tutorials, but rather working sessions on topics that can benefit from some collaborative thought by people interested in learning more about what others know and think.

The objective is to increase the knowledge base of participants wrestling with issues at work, that can benefit from broader exposure to what others with similar issues and interests have experienced, are thinking, and know.

We want to choose 8 workshop topics that are of value to the organizations and people in our region. We seek your input on choosing topics that will inspire you and others in your organization to attend and participate.

Some Possible Topics for Consideration—But What do You Want?

- High performance teaming
- T&E for unmanned systems
- Meaningful customer involvement
- Team-engaged sub-contractors
- User-embraceable system design
- Agile hardware-development
- Agile security adaptable to attack evolution
- IPT support infrastructure
- High-value academic relationships
- Systems engineering cultural transformation

What Systems Engineering issues do you have that need some inspirational thought? Are any of the above suggestions, or suggestions you can offer, of sufficient interest to encourage you and/or personnel from your organization to participate?



Fall 2-Day Socorro Workshop ConOps

Objectives: Engaged professional development. Expanded work-relevant network. New knowledge to take home. A stimulating time-out from deadline driven work that leaves little time for thinking.

Intent: Understand the problem and solution spaces of the topic area better—barriers to solution, roots of cultural incompatibilities and push back, systemic inertia, misaligned forces, and solution value propositions, objectives, and requirements.

Day 1: Speed dating. Workshop leaders will provide an intro to their topic of about 1.5 hours each. Participants can attend four intros in the time allowed. During this 1.5 hour intro the leader will provide some background on the topic “issues” of workshop interest, limited to only a few issues for focus; outlining what is beyond best practice knowledge and generally accepted knowledge, and worthy of collaborative discussion.

Leaders will also get each participant to provide a brief statement of their personal and organization’s interest and experience in the area, and their interest in the issues to be discussed. The session will conclude with objectives for the 2nd day workshop – which won’t be to solve the issues, but rather to share knowledge and experience that will cross pollinate everybody’s thinking.

This will prepare all who remain interested for a more in-depth exploration on day-2, who will likely be contributing to the collaboration as a mission-driven team, and what is held collectively as general perspectives.



Day 2: Two dance dates. Participants will choose the two 3-hour workshops they will participate in, one in the morning and one in the afternoon, which don't have to be among the four intros they attended on day-1.

The objective of day-2 is to develop a team-work environment, expose each participant to the thinking, practices, and knowledge of the others, and provide new contacts that can become longer term collaborative relationships.

An equal objective is to have the workshop identify a clearer understanding of the problem, concepts, and knowledge that surfaces in the workshop – which will be briefed out in general session to all event participants.

A meet-and-greet reception at end of day-1 will help people socialize with new contacts. On-your-own group dinners after the reception will be facilitated, encouraged to include new contacts and not just who brought you.

It isn't the expectation to solve issues here, as the issues to be discussed are necessarily open and insufficiently understood; but rather the knowledge and idea base of all participants will be expanded, and exposed in a working environment with other people that may become professional colleagues with similar inquisitive interests.

This event is for thinking people that recognize vexing issues worthy of attention, and not expecting quick answers, though some will likely surface for people who get ideas from others that can be immediately applied.



Professional Development & Organizational Benefit

The knowledge base is exploding. The duration of value for any given piece of knowledge is shrinking as new knowledge makes old knowledge obsolete faster. This puts pressure on the speed of knowledge diffusion and anticipation of new knowledge needs. When an organization needs to learn quicker it must shorten the time of knowledge acquisition.

Teaching is a push perspective, learning is a pull perspective. Effective learning is amplified when conducted as a team sport, among people driven by curiosity and a deep-felt need to know something more – a specific something. Collaborative-learning workshops chose topics screened for real appeal to real practitioners – who have a real application for the results. Participants self-selected, bring passionate questions and diverse perspectives, and never fall asleep. Collaborative learning is aided when topics do not have a clear established knowledge base, and when participants cannot claim dominant expertise.

Communities of practice, defined as "people bound by informal relationships who share a common practice," are another very important collaborative learning mechanism. Communities of practice are fluid and interpenetrative rather than bounded, crossing internal and external organizational boundaries. A community of practice emerges when people with similar interests seek each other for discourse, experience sharing, and problem solving assistance.

Collaborative learning is an effective mechanism for knowledge agenda fulfillment, knowledge diffusion, collaborative culture initiation, and community of practice formation. Communities of practice are an effective mechanism for nurturing a collaborative culture and increasing the velocity and richness of knowledge diffusion.



Late Breaking News

- ❑ Attendance fee has been set at \$100.
- ❑ Students may attend free, but must prepare in advance with research on topics of their interest, with faculty guidance.
- ❑ INCOSE President Elect Garry Roedler will be a featured plenary speaker and attend throughout.
- ❑ An optional Women in Engineering dinner social, led by INCOSE Fellow Regina Griego, will be held the 28th for all who wish to attend. Cost and location TBD.
- ❑ Event promotion is INCOSE-wide, with event posted on INCOSE home page, announcement appearing in June INCOSE Newsletter, and more to follow.
- ❑ A survey to select the eight workshop topics will be sent to membership in early July. Please respond, indicating topics of interest to you. See page 8 for suggested topic candidates.
- ❑ Workshop leadership is being recruited INCOSE-wide, but generally awaiting topic selection guided by the survey.
- ❑ Updates on event info are maintained on Chapter website www.incose.org/enchantment under the Library tab, with printable flyer at www.incose.org/docs/default-source/enchantment/161028-flyer-socorrosystemssummit-current.pdf?sfvrsn=2.



Why You Should Attend the Socorro Systems Summit

The article below is part of a presentation Jack Ring made at the April 2016 COFES Conference (Congress on the Future of Engineering Software).

The video underscored the purpose of the Socorro Systems Summit coming this Fall. Full video at: <http://cofes.com/ADMIN-STUFF/Video/Video-Player/VideoId/679/DaS-7-Jack-Ring.aspx>.

Jack Ring, Educe, LLC

I appreciate this opportunity to share ideas with you. These reflect my experiences in Educe LLC where we serve :

- ❑ those who know they don't know,
- ❑ those who don't know they know and
- ❑ those who don't know they don't know.

We do not strive to serve those who know they know because it takes too much time and effort to help them see that what they know just ain't so --- and then they don't appreciate it.

Why You Should Attend the Socorro Systems Summit

Rick Dove, *Paradigm Shift International* The article below is part of a presentation Jack Ring made at the April 2016 COFES Conference (Congress on the Future of Engineering Software). Watching the video, I heard Jack underscoring the purpose of the Socorro Systems Summit coming this Fall. Jack is an INCOSE Fellow, and a frequent presenter at Enchantment Chapter meetings. Full video at: <http://cofes.com/ADMIN-STUFF/Video/Video-Player/VideoId/679/DaS-7-Jack-Ring.aspx>.

Professional Development through Co-Evolution—A Team Sport



Jack Ring, Educe, LLC

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According to Dee Hock, co-founder of the VISA Corporation and author of Birth of the Chaordic Age the first steps are

- Commit to a compelling purpose and
- Commit to a few principles that foster synergy among your COMMUNITY OF PURPOSEFUL PRACTICE (COPP).

I suggest that we consider these ten degrees of synergy, starting bottom left with Connect, and ascending to Co-evolve. These indicate your degree of contribution in your COMMUNITY.

Your evolution to your personal best will enable your degree of contribution. If you can exhibit the behaviors in the right column then results will occur as shown in the middle column.

Read the chart this way ---

- 1) To connect you must have accessible attributes, so that each can discover another.
- 2) To communicate you must have a common language, so that interests and values can be shared.
- 3) To converge there must be shared self-respect to pursue the compelling purpose. Else each does their own thing.
- 4) To commit you must have the courage to plan, so that a principled relationship enables the COMMUNITY.
- 5) To co-operate means compatible actions enabled by your willingness to wait.
- 6) To co-celebrate means en-joying one another, if you commit to enough time and space and do enough Face to Face.
- 7) To co-labor, or help one another, you must have a desire to serve.

There's more. Most current literature stops at collaborate as if that's all there is. But Design and Sustainability offers more.

- 8) If you share your knowledge claims and appreciate others vetting them, then you can Co-learn through meaningful reflection.
- 9) Co-facilitate means everyone is a leader. In any group if you encourage and support N-party stewardship then the Return on Effort approximates e to the N power.
- 10) Co-evolve. If you have a joy-enabled Level of Consciousness then you will foster each one morphing toward a win-win result.

A joy-enabled level of consciousness may be a strange concept to some of you. That 10-level Personal Best stack may seem quite challenging. Is the capability to Co-evolve with your associates worth it? What's the Value Proposition?

Relationships	Results	Mediators
Co-evolve	Morphing toward Win-Win	Joy-enabled level of consciousness
Co-facilitate	Value out/value in = e^N	N party stewardship
Co-learn	Meaningful reflection	Shared knowledge claims
Collaborate	Help one another	Desire to serve
Co-celebrate	En-joying one another	Time & space, face-to-face
Cooperate	Compatible actions	Willing to wait
Commit	Principled relationship	Courage to plan
Converge	Compelling purpose	Shared self-respect
Communicate	Share interests & values	Common language
Connect	Each discovers an other	Accessible attributes

On the positive side the various COMMUNITIES in which you engage will always become more Fit For Purpose. They will Win more often.

Also, value will be earned by Do No Harm. This becomes more important as our world becomes more complex and chaotic. It may not be easy to achieve. For 2500 years, physicians have taken the Hippocratic oath to Do No Harm yet current data shows that approximately 50% of the therapies physicians devise today are not fit for purpose.

On the prevention side...

First, you will help prevent hubris and intellectual arrogance. The inability to admit error, thereby to learn.

Second, you will help prevent consensus from overriding critical thinking. Also called Group Think and Clan Think. Group Think occurs when consensus is reached even though some know the conclusion is incorrect. This is the "go along to get along" syndrome. Clan Think is when a COMMUNITY of strongly like-minded people agree without even considering alternatives.

Third, you will help prevent the occurrence of the Law of Unintended Consequences, which Robert Merton warned us about in 1936 and too many of us still commit 80 years later.

Changing yourself and facilitating change throughout your various COPPs can be a very daunting task. Or, you can leverage the strategy of the dandelion. Dandelion seedlings, like good ideas, are not impeded by walls. The air currents caused by walls lifts the seedlings up and over walls and takes them on their way.

So the issue is, are you sustainable? The question is not how sustainable are you? Instead it is a Yes or No question. If you are not sustainable, then all the effort we put into sustainability methods and tools will be futile.

If you are sustainable, you can write your clear, compelling purpose regarding sustainability, and write nine or so principles by which you will abide in your COMMUNITY.

If you are not quite sustainable, I recommend you: 1) become a Reflective Practitioner, 2) co-evolve your character, and 3) you make lots of little mistakes (and learning) but no BIG ONES. ∞



Candidate Topics and Issues for the Socorro Systems Summit

What Systems Engineering issues do you have that need some inspirational thought? Are any of the suggestions below, or suggestions you can offer, of sufficient interest to encourage you and/or personnel from your organization to participate?

High performance teaming—A high-performance team is a group of people committed to a common purpose, showing high levels of collaboration and innovation. Why isn't this a compelling behavior that sucks all of us in naturally? What stands in the way? What requirements are needed to enable and facilitate a natural attraction to high performance teaming?

T&E for unmanned and autonomous systems—Autonomous systems are expected to show emergent behaviors that defy traditional T&E and require new T&E thinking. What are the requirements for an effective approach?

Meaningful customer involvement—How do we enable and facilitate customer-involved acceptance of responsibility for effective requirements, workable schedules, development priorities, meaningful feedback, and collaborative re-assessment?

Sub-contractors as fully engaged team members—How do we get a project team with subcontractors to optimize total team mission success, rather than contradictory individual benefits?

Design concepts of user-embraceable systems—System quality is ultimately measured by user enjoyment, rather than requirements fulfillment. How do we design and implement with the goal of user enjoyment in the sense of system-user synergy?

Critical infrastructure resilience—given that we don't have much of it, what are the impediments and what are the requirements for effective transformation of what we have?

Systems of Systems evolutionary integrity—Systems-of-systems evolve as individual systems change. What are the requirements for maintaining SoS integrity with asynchronous and self-serving system evolution?

Organizational teaming for joint project pursuit—What impedes discovery and appreciation of opportunities for working together among organizations, what is required to break down these impediments, and what can be done about them?

Agile hardware-development infrastructure and ConOps—How can hardware development infrastructures enable and facilitate asynchronous unit testing and safe, rapid design change? Software uses an infrastructure of object-oriented development platforms and loosely-coupled web-page linkage. What are infrastructure requirements for equivalent hardware capability?

Agile security adaptable to adversary attack evolution—What are the requirements for system and security strategy that will enable response with at least the agility of the adversary? What are implications for architecture, design, and ConOps?

IPT support infrastructure for data and communication—Projects with multiple teams of individual discipline need an infrastructure that enables and facilitates communication and data sharing that manifest as a collective shared consciousness. What are the impediments and requirements for achieving this?

High-value relationships with/among academic institutions—Where are compelling values and synergies for academic institutions and organizations to develop unimpeded productive relationships. What are the obstacles and requirements for overcoming them?

Systems engineering cultural transformation—A systems engineering culture is an umbrella of shared values and behaviors that transcends the individual cultures of teams, departments, and disciplines—rooted in the appreciation of overarching system concepts and system relationships. What impedes a compelling draw toward the recognition and realization of value here? What is required for an effective transformation?

Systems engineering as multidiscipline enabler, art, and science—Systems engineering has migrated to an engineering procedure and project management based discipline. How can we raise awareness and understanding to a systems level?

Integration in large-scale systems for operational up-grades—System integration for upgrades/enhancements to large-scale programmatic systems under operating conditions has difficulties. Typical outage window aren't long enough to accommodate major upgrades, but lengthening the outage has negative effect on availability needs. What impedes seamless cutover? What is required to enable seamless cutover?

Fail-fast rapid innovation concepts—How do we enable and facilitate innovative experimentation, driven by a focus on fast discovery of insufficiency or inadequacy? What is the compelling value proposition for budgeting and scheduling innovation experimentation? How can experimentation be managed for fast-fail discovery, and appreciated for value?



Socorro Systems Summit

Professional Development and Organizational Benefit



October 28-29, 2016
 Socorro, New Mexico
 New Mexico Tech
 Joseph A. Fidel Center
 8 Collaborative Workshops
 Co-Sponsored by:
 INCOSE Enchantment Chapter
 NMTech EE Department
 Self-Select for Interest:
 1st Day: sample 4 topics
 2nd Day: contribute to 2 topics



- Systems Engineering Cultural Transformation
- SE as Multidiscipline Enabler/Art/Science
- High Performance Teaming
- Systems of Systems Evolutionary Integrity
- Agile Security Adaptable to Attack Evolution
- Organizational Teaming for Joint Project Pursuit
- Agile HW-Development Infrastructure/ConOps
- Fail-Fast Rapid Innovation Concepts

EWLSE Dinner Gathering at the Summit *Regina Griego, Sandia National Labs*

There will be a dinner gathering for Empowering Women as Leaders in Systems Engineering (EWLSE) at the Socorro System Summit. We enthusiastically invite Summit attendees to join in a dialogue where we will ask participants to share their stories, exchanging tips and insights about navigating the systems engineering leadership journey, with particular emphasis on the Women Systems Engineer brand of leadership. Don't miss the conversation!



Collaborative Exchange at the Socorro Systems Summit

Workshop abstracts below are suggestions by the moderators, but **workshop participants will own the agenda**. Moderators will instigate discussion with a brief introduction on the first day, and then turn the floor over to participants for convergence on objectives for the second day. Moderators welcome pre-Summit communication – see Program Committee listing for email addresses.

Systems Engineering Cultural Transformation

Ed Carroll, Sandia National Labs.

A systems engineering culture is an umbrella of shared values and behaviors that transcends the individual cultures of teams, departments, and disciplines—rooted in the appreciation of overarching system concepts and system relationships. Engineering is an ancient discipline, but systems engineering has a history of only a few decades. The primary benefits of systems engineering have been stated as the ability to control complexity, improve communication, and prevent defects. Systems engineering and particularly model-based systems engineering, is often touted as the approach to ensure high reliability from systems that are at the same time becoming more auto-mated, adaptable, agile, and interoperable. These systems tend to also become more complex system-of-system solutions. If systems engineering is the approach to control this explosion of complexity and assurance of reliability, then why is the transformation to a systems engineering culture so difficult? It has been said that determining the return-on-investment for a transformation to a systems engineering approach is practically impossible to determine. What, then, is the paradigm shift that needs to happen to implement a successful systems engineering culture? What is required for an effective transformation? What impedes the recognition and realization of value here? This workshop will explore individual and organizational challenges that need to be overcome to effect a transformation toward a successful systems engineering culture.



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Rick Dove, Paradigm Shift International

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If systems engineering is the approach to control this explosion of complexity and assurance of reliability, then why is the transformation to a systems engineering culture so difficult? It has been said that determining the return-on-investment for a transformation to a systems engineering approach is practically impossible to determine. What, then, is the paradigm shift that needs to happen to implement a successful systems engineering culture? What is required for an effective transformation? What impedes the recognition and realization of value here?

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Organizational Teaming for Joint Project Pursuit

Kevin Forsberg, OGR Systems, INCOSE Fellow, ESEP.

Joint project teaming brings together different organizations with diverse capabilities to satisfy a customer need competitively. An “A” team covers all the project bases with specialty expertise, capability, and experience, presenting no weak spots. Appreciating and seeking the values of joint-team strength can be inhibited by organizational culture, tradition, and politics. Finding appropriate team members that can fill the technical gaps, improve proposal reception, and/or deliver superior results can be problematic under time pressures and the hurdles of new-relationship trust and respect development. There are awesome resources available for A team configurations.

What are the values of joint-project teaming that can outweigh the obstacles? What are the obstacles? What requirements must be satisfied to encourage and realize beneficial teaming relationships? How might joint-teaming opportunities be enabled and facilitated to compelling benefit?

This workshop will open the dialog, explore the opportunity, and identify means for advancing the pursuit of organizational joint-project teaming.

Continued on next page

High Performance Teaming

Ann Hodges, Sandia National Labs, CSEF.

A high performance team is a group of people committed to a common purpose, who consistently show high levels of collaboration and innovation. A high performance team produces superior results and a sense of personal joy in every participant - it takes the work out of work. There is plenty written on the characteristics of high performing teams and high performance teaming. So why isn't high performance teaming very prevalent? Why isn't it a compelling behavior that draws all of us in naturally? Is it a fault of leadership? Or is it a collection of personal issues and systemic organizational conflicts?

What are the compelling personal values for working in a high performing team and what inhibits an irresistible pull in that direction for all of us? What motivates people to create a team culture of high performance? What personal issues stand in the way, no matter how much it is wanted? Claiming lack of enlightened leadership and corporate strategic imperative is an excuse to live with the status quo. High performance teaming is fueled most effectively by personal desire, personal motivation, and personal initiative, coupled with a trust-filled team environment. Many of us have had the occasion to be a member of a high performing team, but all too occasionally. If you've ever experienced it you know it's fun, rewarding, and memorable.

This workshop will explore the personal and organizational inhibiting barriers, requirements for a personally-compelling solution, and personal initiatives to make a difference.

Fail-Fast Rapid Innovation Concepts

Bill Schindel, ICTT Systems Science, CSEF.

Innovation delivers new stakeholder value, and includes discovery of new system configurations—including those which are insufficient or inadequate. The value of well-organized exploration efforts is that they will, on the average, produce higher-value results for a given investment of resources than other approaches. But “Fail-Fast Rapid Innovation” cannot simply mean quickly producing a series of rejected options. The discovery and experimental aspects of engineering are sometimes overshadowed by a belief that engineering proceeds only by syllogistic reasoning from a known place and first principles to a new place, but that is not the nature of innovation, which is itself not always so well understood.

If we must organize and direct resources into completely unknown territory, what roadmap can we use for planning, budgeting, and scheduling? How can we optimize use of our resources so that these investments are well-justified and understood?

This workshop will explore the nature and properties of the innovation process as related to effectiveness of experimentation and discovery as key parts of innovation.

Systems of Systems Evolutionary Integrity

Dr. Scott Workinger, Workinger Consulting.

Evolutionary integrity in System of Systems is concerned with upgrades to constituent systems during operation and mitigating disruptions that arise from asynchronous and unpredictable changes when independent constituent systems change without warning. Effective integrity management seeks seamless upgrades to constituent systems and the SoS as a whole. Yet, in practice, service-outage windows often don't accommodate major upgrades, and lengthening the outage can create an unacceptable disruption to SoS capabilities. Moreover, self-serving changes in constituent systems can interfere with total-SoS functionality. Even with well-meaning efforts to manage constituent systems, emergent behavior from constituent system interactions can arise unpredictably, creating serious disruptions.

In general, what are the barriers to integrity management in an SoS composed of independently-owned systems? What inhibits sustained integrity in a complex collection of interacting systems and how can we define integrity for an SoS with no central authority to approve changes? What are the characteristics of a workable integrity management approach? Are these characteristics of effective integrity management represented in examples that we can share? Are there general principles that we can identify and apply to achieve robust integrity management?

This workshop will explore these questions and others that participants have, with the objective of profiling the issues, converging on a set of general needs that an effective integrity management approach must satisfy, and sharing knowledge and experience on approaches that show some effectiveness.

SE as Multidiscipline Enabler/Art/Science

Dr. Regina Griego, Sandia Nat'l Labs, INCOSE Fellow.

The branding of systems engineering in many companies and with too many systems engineers is that systems engineering is about developing good process and enabling that process in an organization to achieve systems that are delivered on time, within schedule, and meets requirements. While process is an enabler, it is like the score of music that a good conductor interprets with talented musicians and instruments to deliver a system that not only meets customer expectations, but indeed delights the customer and has an enduring quality. The conductor (systems engineer) knows how to adjust the score for the effect they are trying to achieve and integrates the musicians effectively based on their unique abilities.

Think about the systems that you are most proud of, or the times that you have been a part of a system development effort that felt exciting, even exhilarating. Would you say they are works of art, or simply science, process, and project management? Systems architecture and design are the most obvious areas where the art of systems engineering is applied, but it is equally important to apply the art of understanding people and teaming. In systems engineering you are working with at least two systems, the system you are delivering and the system that is delivering. When have you experienced the flow as a systems engineer? How would you characterize systems engineering in your organization: process and project management or a blend of art and science?

This workshop will explore the art and science of systems engineering and the notion of the systems engineering brand.

Agile Security Adaptable to Attack Evolution

Jack Ring, OntoPilot, INCOSE Fellow.

Agile security must be reactively resilient and proactively composable at the pace of unpredictable and evolving adversarial attackers and their attack methods. The adversarial attack may originate from outside the system or, particularly in system of system scenarios, from inside the system. This idea encompasses information systems, cyberphysical systems, physical systems, infrastructure systems, and national defense systems. Success demands close collaboration and co-learning by system engineering and security engineering interests. System engineering seeks sustainable systems. Security engineering seeks sustainable system defense. It takes both to succeed against agile adversaries. The respective practitioners march to separate drum beats. Security engineering must educate systems engineers on the kinds and sources of threats and needs for detecting and defeating them. System engineering must satisfy new demands on system architecture, system design, systems engineering, and security engineering. All need to better understand their requisite interoperability.

What stands in the way of synergistic engineering cooperation? What are the requirements for an effective engineering-team approach? What can systems engineering do to enable and facilitate the needs of agile-security engineers? What can security engineering do to enable and facilitate engagement with systems engineers?

This workshop will explore values and needs for cooperative agile-security engineering, identify the inhibiting barriers suggest concepts that any effective solution must address, and open a dialog on potential solutions.

Agile HW-Development Infrastructure/ConOps

Rick Dove, Paradigm Shift Int'l, INCOSE Fellow.

An agile development infrastructure provides an architectural framework for component interconnect that enables asynchronous, incremental, and iterative component development. An agile hardware-development infrastructure would facilitate asynchronous component testing, alignment with agile software development, demonstrable and testable work-in-process of mixed component releases/prototypes/simulations, and operational system evolution. But hardware development is very different than software development. Agile software development relies on object-oriented infrastructure and webpage hyperlink couplings as architectural underpinnings. Software developers are simultaneously designers and fabricators, and incremental development lends itself to incremental test and demonstration. In contrast, hardware development has issues of tooling; communication between designers, fabricators, and assemblers; and costly re-work.

An agile approach is beneficial when development occurs under uncertainty, unpredictability, and situational evolution – requiring the application of incremental learning during development. What are the barriers to incremental and iterative hardware development? Can concepts from product-line engineering, open system architecture, or live-virtual-constructive approaches offer guidance? Are proprietary approaches the only avenue, or is there opportunity for affordable common development-platform tools?

This workshop will explore the values, the issues, and the requirements for possible solutions.



Socorro Systems Summit – Program Schedule

Organizers:

- Mary Compton, Sandia National Laboratories, mcompt@sandia.gov
- Rick Dove, Event Chair, Paradigm Shift International, rdove@parshift.com
- Dr. Aly El-Osary, New Mexico Tech Electrical Engineering Department, aly.elosary@nmt.edu



Program Committee

- Ed Carroll, Sandia National Laboratories, ecarro@sandia.gov
- Rick Dove, Paradigm Shift International, rdove@parshift.com
- Dr. Kevin Forsberg, OGR Systems, kforsberg@ogrsystems.com
- Dr. Regina Griego, Sandia National Laboratories, rgriego@sandia.gov
- Ann Hodges, Sandia National Laboratories, ahodges@sandia.gov
- Jack Ring, OutoPilot, jack@outopilot.com
- Bill Schindel, ICTT System Sciences, schindel@icctt.com
- Dr. Scott Workinger, Workinger Consulting, scotworkinger@gmail.com

Day-1: Choose four from eight ¼-day topic introductions, collaboratively setting objectives for Day-2.
Day-2: Choose two from eight ¼-day topic workshops, for developing collective knowledge.

Preliminary Agenda: Some items & times may move for final schedule. Coffee breaks not shown explicitly.

Friday October 28, 2016			
08:00	General Session: Welcome and What Will Happen		
08:30	Keynote: Garry Roedler, INCOSE President Elect		
09:00	Systems Engineering Cultural Transformation Topic Intro and Objective Setting for Saturday Workshop Moderator: Ed Carroll	Agile Security Adaptable to Attack Evolution Topic Intro and Objective Setting for Saturday Workshop Moderator: Jack Ring	
10:30	SE as Multidiscipline Enabler/Art/Science Topic Intro and Objective Setting for Saturday Workshop Moderator: Regina Griego	Organizational Teaming for Joint Project Pursuit Topic Intro and Objective Setting for Saturday Workshop Moderator: Kevin Forsberg	
12:00	Lunch on Your Own		
13:00	High Performance Teaming Topic Intro and Objective Setting for Saturday Workshop Moderator: Ann Hodges	Agile HW-Development Infrastructure/ConOps Topic Intro and Objective Setting for Saturday Workshop Moderator: Rick Dove	
14:30	Systems of Systems Evolutionary Integrity Topic Intro and Objective Setting for Saturday Workshop Moderator: Scott Workinger	Fail-Fast Rapid Innovation Concepts Topic Intro and Objective Setting for Saturday Workshop Moderator: Bill Schindel	
16:00	General Session: Brief Outs of Eight Workshop Objectives Established During Topic Intro Sessions		
17:00	Reception with Refreshments		
18:30	Dinner on Your Own	Optional Dinner Gathering (Separate Advanced Ticket): Empowering Women as Leaders in Systems Engineering	
Saturday October 29, 2016			
08:00	Systems Engineering Cultural Transformation Moderator: Ed Carroll	Fail-Fast Rapid Innovation Concepts Moderator: Bill Schindel	Systems of Systems Evolutionary Integrity Moderator: Scott Workinger
			Agile Security Adaptable to Attack Evolution Moderator: Jack Ring
11:30	Lunch on Your Own		
12:30	High Performance Teaming Moderator: Ann Hodges	Organizational Teaming for Joint Project Pursuit Moderator: Kevin Forsberg	SE as Multidiscipline Enabler/Art/Science Moderator: Regina Griego
			Agile HW-Development Infrastructure & ConOps Moderator: Rick Dove
16:00	General Session: Eight Brief Outs of Results @ 10 Minutes Each		
17:30	General Session: Wrap Up and Open Discussion		
18:30	Adjourn		

Friday October 28, 2016

08:15	General Session: Welcome and What Will Happen – Aly El-Osery and Rick Dove		
08:45	Keynote: Garry Roedler, INCOSE President Elect		
09:15	Adjust Room Walls for Break-Outs – Coffee Break		
09:30	Systems Engineering Cultural Transformation Topic Intro and Objective Setting for Saturday Workshop Moderator: Ed Carroll	Agile Security Adaptable to Attack Evolution Topic Intro and Objective Setting for Saturday Workshop Moderator: Jack Ring	
11:00	SE as Multidiscipline Enabler/Art/Science Topic Intro and Objective Setting for Saturday Workshop Moderator: Reqina Griego	Organizational Teaming for Joint Project Pursuit Topic Intro and Objective Setting for Saturday Workshop Moderator: Kevin Forsberg	
12:30	Room C	Lunch on Your Own	Room B
13:30	High Performance Teaming Topic Intro and Objective Setting for Saturday Workshop Moderator: Celeste Drewien	Agile HW-Development Infrastructure/ConOps Topic Intro and Objective Setting for Saturday Workshop Moderator: Rick Dove	
15:00	Systems of Systems Evolutionary Integrity Topic Intro and Objective Setting for Saturday Workshop Moderator: Scott Workinger	Fail-Fast Rapid Innovation Concepts Topic Intro and Objective Setting for Saturday Workshop Moderator: Bill Schindel	
16:30	Break		
17:00	Reception with Refreshments and Saturday Workshop Posters: Objectives and Choices		
18:30	Dinner on Your Own	Optional Dinner Gathering (Separate Advanced Ticket): Empowering Women as Leaders in Systems Engineering	

Saturday October 29, 2016

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18:00	Adjourn			

Flyer Program Registration Hotels Maps Proceedings



Socorro Systems Summit Two Days of Collaborative Exchange on Open Issues Oct 28-29, 2016

Download printable flyer [here](#)

Co-sponsors: INCOSE Enchantment Chapter and New Mexico Tech Electrical Engineering Department.

Practitioners teaming for knowledge exchange and development on issues of interest – professional development.

Day-1: Choose four from eight ¼-day topic introductions, collaboratively setting objectives for Day-2.

Day-2: Choose two from eight ½-day topic workshops, for developing collective knowledge.

Location: New Mexico Tech (NMT), Socorro, New Mexico – a charming small-community location 60 minutes south of the Albuquerque airport. To maximize participation value, we have topics of current interest confirmed by surveys and interviews, and have selected workshop leaders with collaborative-facilitation skills and familiarity with their topic.

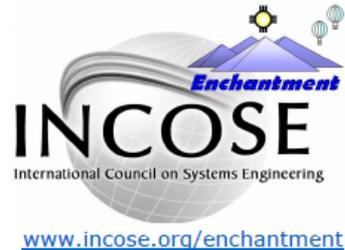
Attendance fee is \$100, with UTEP and NMT students admitted free with faculty-advisor registration and workshop topic research completed before attendance, per faculty advisor guidance.

Registration information is posted [here](#) (Library tab at www.incose.org/enchantment).

Workshop Topics:

rick.dove@parshift.com, attributed copies permitted

Event Flyer



www.nmt.edu

Socorro Systems Summit—Collaborative Knowledge Exchange—Oct 28-29, 2016

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Workshop Topics:

Objectives: Engaged professional development. Expanded work-relevant network. New knowledge to take home. A stimulating time-out from deadline driven work that leaves little time for thinking.

Intent: Understand problem and solution spaces of the topic area better—barriers to solution, cultural incompatibility and push back, systemic inertia, misaligned forces, and solution value propositions, objectives, and requirements.

- **Systems engineering cultural transformation**—A systems engineering culture is an umbrella of shared values and behaviors that transcends the individual cultures of teams, departments, and disciplines—rooted in the appreciation of overarching system concepts and system relationships. What impedes a compelling draw toward the recognition and realization of value here? What is required for an effective transformation?
- **Systems engineering as multidiscipline enabler, art, and science**—Systems engineering has migrated to an engineering procedure and project management based discipline. How can we raise awareness and understanding to a systems level?
- **High performance teaming**—A high-performance team is a group of people committed to a common purpose, showing high levels of collaboration and innovation. Why isn't this a compelling behavior that sucks all of us in naturally? What stands in the way? What requirements are needed to enable and facilitate a natural attraction to high performance teaming?
- **Systems of Systems evolutionary integrity**—Systems-of-systems evolve as individual systems change. What are the requirements for maintaining SoS integrity with asynchronous and self-serving system evolution?
- **Fail-fast rapid innovation concepts**—How do we enable and facilitate innovative experimentation, driven by a focus on fast discovery of insufficiency or inadequacy? What is the compelling value proposition for budgeting and scheduling innovation experimentation? How can experimentation be managed for fail-fast discovery, and appreciated for value?
- **Agile security adaptable to adversary attack evolution**—What are the requirements for system and security strategy that will enable response with at least the agility of the adversary? What are implications for architecture, design, and ConOps?
- **Agile hardware-development infrastructure and ConOps**—How can hardware development infrastructures enable and facilitate asynchronous unit testing and safe, rapid design change? Software uses an infrastructure of object-oriented development platforms and loosely-coupled web-page linkage. What are infrastructure requirements for equivalent hardware capability?
- **Organizational teaming for Joint project pursuit**—What impedes discovery and appreciation of opportunities for working together among organizations, what is required to break down these impediments, and what can be done about them?

Keynote Speaker: INCOSE President-Elect Garry Roedler will be a featured keynote speaker and attend throughout.

Day 1: Speed dating. Workshop leaders will provide an intro to their topic of about 1.5 hours each. Participants can attend four intros in the time allowed. During this 1.5 hour intro the leader will provide some background on the topic "issues" of workshop interest, limited to only a few issues for focus; outlining what is beyond best practice knowledge and generally accepted knowledge, and worthy of collaborative discussion. Leaders will also get each participant to provide a brief statement of their personal and organization's interest and experience in the area, and their interest in the issues to be discussed. The session will conclude with objectives for the 2nd day workshop – which won't be to solve the issues, but rather to share knowledge and experience that will cross pollinate everybody's thinking. This will prepare all who remain interested for a more in-depth exploration on day-2, who will likely be contributing to the collaboration as a mission-driven team, and what is held collectively as general perspectives.

Day 2: Two dance dates. Participants will choose the two 3-hour workshops they will participate in, one in the morning and one in the afternoon, which don't have to be among the four intros they attended on day-1. The objective of day-2 is to develop a team-work environment, expose each participant to the thinking, practices, and knowledge of the others, and provide new contacts that can become longer term collaborative relationships. An equal objective is to have the workshop identify a clearer understanding of the term, concepts, and knowledge that surfaces in the workshop – which will be briefed out in general session to all event participants.

A meet-and-greet reception at end of day-1 will help people socialize with new contacts. On-your-own group dinners after the reception will be facilitated, encouraged to include new contacts and not just who bring you.

An optional dinner gathering, Empowering Women as Leaders in Systems Engineering (EWLSE), will be held after the meet-and-greet reception, at the Socorro Springs Brewery. \$15.00 ticket for all who wish to attend.

Value Proposition for Personal and Organizational Participation

The knowledge base is exploding. The duration of value for any given piece of knowledge is shrinking as new knowledge makes old knowledge obsolete faster. This puts pressure on the speed of knowledge diffusion and a focus on the anticipation of new knowledge needs. When an organization needs to learn quicker it must shorten the time of knowledge acquisition.

Teaching is a push perspective, learning is a pull perspective. Effective learning is amplified when conducted as a team sport, among people driven by curiosity and a deep-felt need to know something more – a specific something. Collaborative-learning workshops choose topics screened for real appeal to real practitioners – who have a real application for the results. Self-selected participation brings passionate questions and diverse perspectives, and nobody falls asleep. Collaborative learning is aided when topics do not have a clear established knowledge base, and when participants cannot claim dominant expertise. This is the basis for the October 28-29 Socorro Systems Summit.

Communities of practice, defined as "people bound by informal relationships who share a common practice," are another very important collaborative learning mechanism. Communities of practice are fluid and interpenetrative rather than bounded, crossing internal and external organizational boundaries. A community of practice emerges when people with similar interests seek each other for discourse, experience sharing, and problem solving assistance.

Collaborative learning is an effective mechanism for knowledge agenda fulfillment, knowledge diffusion, collaborative culture initiation, and community of practice formation. Communities of practice are an effective mechanism for nurturing a collaborative culture and increasing the velocity and richness of knowledge diffusion.

It isn't the expectation to solve issues here, as the issues to be discussed are necessarily open and insufficiently understood; but rather to increase the knowledge and idea base of all participants, exposed in a working environment with other people that may become professional colleagues with similar inquisitive interests. This event is for thinking people that recognize vexing issues worthy of attention, and not expecting quick answers, though some will likely surface for people who get ideas from others for immediately application.

The INCOSE Enchantment Chapter (New Mexico and El Paso, TX) has a mission to support Systems Engineering needs and membership professional development and engagement. To this end the Systems Engineering 2-day multi-workshop event is taking place October 28-29, in Socorro, New Mexico, at New Mexico Institute of Mining and Technology (NM Tech). Participation is open to all with interest, and is being promoted INCOSE-wide.

These workshops will not be tutorials, but rather working sessions on topics that can benefit from collaborative thought by people interested in learning more about what others know and think. The objective is to increase the knowledge base of participants wrestling with issues at work, that can benefit from broader exposure to what others with similar issues and interests have experienced, are thinking, and know.

After polling members and their organizations we have chosen the eight topics shown above, ones intended to inspire you and others in your organization to attend and participate. Workshop leadership selection was done INCOSE-wide, favoring people with facilitation skills for eliciting collaborative participation, over depth of subject matter expertise, though familiarity with and interest in the topic is necessary. Workshop leaders will open their workshop with appropriate positioning and background on the topic to focus subsequent collaborative discussion, and guide the effort toward meaningful knowledge sharing and development.

Moderator Guidance

On Friday there is a 1.5 hour intro:

- **30 minute moderator overview of the open issues in the topic area.**
- **30 minutes of everybody saying who they are, what they and their organization have of interest in the area, what they would like to see discussed and walk away with.**
- **30 minutes converging on a (very) short list of what Saturday's 3.5 hour workshop will have as objectives. During this last period a PPT slide is made of the objectives that will be briefed out at end-of-day general session so people can see which of the two workshops they want to attend the next day.**
- **There will be an NMT student present to help, as a tech rep on the audio visual equipment, and perhaps as the brief out slide maker with instruction by the moderator, et al.**

On Saturday there is a 3.5 hour workshop

- **Moderators aren't there as subject matter experts, to tell people how to solve their problems, but rather getting them to understand the problem better in their context, the barriers to solution in their context, and the general requirements for effective solutions in any context, and to the extent possible, some plans for collaborating subsequently on solutions.**

Feedback

This Summit was an experiment in collaborative exchange.

Are you glad you came (1-5)? _____ (1=No, 5=Definitely)

Should we do another (1-5)? _____ (1=No, 5=Definitely)

Do you prefer October or August or either? _____

Feedback on what you liked :

Feedback on what you didn't like:

Feedback to make it more effective:

Participant___Student___Moderator___ (check as many as apply)

Planning Positioning

Vision: Awesome all-stakeholder experience.

After-Event Reputation Objectives:

- Well run personal experience.
- Valuable expenditure of my time.
- Good post-event knowledge take-away and synopsis.
- Awesome significant event that should be repeated.

Event-Production Mission – In terms of user-experience metaphors:

- Disneyland as a system-managed total experience – operation, maintenance, and repair.
- TED event attendance as an experience that generates feelings of privilege and significance: exposure to thoughts of interest and interesting people, access to and interaction with interesting people, a sense of participating/belonging to something exciting and meaningful.

Context – We've never done an event like this before:

- Plan for 50-100 people (who will say things about their experience and impressions to others).
- Non-local attendees (no local knowledge, transportation needs).
- Multiday hotel and meal considerations for participants.
- A campus facility we as producers/operators are unfamiliar with.
- Parallel performances in multiple rooms.
- Multiple performance leaders.
- Travel-in keynote speaker (who will say things about his experience and impressions to others).

Stakeholders to Satisfy (with suggested leads for identifying satisfaction requirements):

- Host site organizer
- Chapter BOD as lead sponsors
- Workshop moderators
- Regional workshop participants
- Out-of-region participants
- Student Chapter participants
- Keynote speaker
- Organizational supporters
- Other Chapters
- Production/Operations Director/Manager
- Program Director/Manager
- INCOSE (they are committing promo resources)

Jobs Needing Done – Separate document

Considerations

Ascertain value propositions for key people: site-host, moderators, organizers, producers, organizations that will support participation – with one-on-one conversation.

Propose synergistic value propositions in line with Summit intent.

Channel moderator positioning and behavior.

Ascertain high-value topics ready for engagement – with one-on-one interviews of managers at local organizations.

Appeal to organizations.

Empower participants: name-only badges, agenda in badge holder.

Give a broad topic taste intro before intense workshop.

Have participants decide the mission objective details (within the Summit intent).

Keynote that addresses values of Summit approach and topics of interest.

Keynoter is not the attraction, but rather the inspiration.

Moderators are not the attraction, but rather the motivators.

No flitting allowed – join a mission team passionately.

Multi-day – overnight thought is valuable

Facilitate follow-on solution groups

Use students to support workshop activities and findings

Feedback open-comments rather than 1-5 ratings

Preliminary Event-Project Preparation Scheduling – Based on October 28-29 Event

Start	Finish	Responsible Person(s)	Stuff to do
1/22	2/24		Establish event committee and roles.
2/15	3/15		Arrange and attend planning meeting at Hosting site.
3/15	4/15		Establish date for the event.
2/15	3/15		Identify interviewees at organizations for workshop topic interests.
2015	3/15		Develop event concept planning document.
2/15	3/15		Develop proposal and value proposition for organizational support.
3/15	5/15		Interview organizations for workshop topic interests (named specifically here).
5/15	6/15		Membership survey on topics and attendance.
5/15	5/25		Event flyer.
5/15	7/15		Identify and secure workshop topic moderator commitments.
3/15	monthly		Heads up included in Chapter monthly announcements.
4/15	6/15		Identify and secure plenary speaker(s).
4/15	6/15		Obtain hotel info.
3/1	10/1		Comprehensive Chapter website Summit pages (posted proceedings afterwards)
Q234	Q234		Promote in Q2-Q3-Q4 Chapter Newsletters and Chapter Website Summit Page(s).
Q234	Q234		Promote through INCOSE channels – INCOSE Newsletter, TOC, et al.
5/15	7/15		Obtain regional organizational support commitments to send participants.
4/15	6/15		Budget (continuous updating monthly) with attendance fees.
5/15	6/15		Event agenda prelim.
5/15	8/15		Event agenda final
6/15	8/15		Registration web page
4/15	8/30		Event staffing plan – involve students from Hosting site.
9/15	10/27		Handouts and badges
6/15	8/15		Event operational plan.

<Topic>

Moderator: <name>

(as decided Friday, subject to change during Saturday)

Planned Primary Workshop Issues to Explore

??

??

??

Potential Secondary Workshop Issues to Explore

??

??

??

Objectives

??

??

??

Day-1 Brief-Out: You own this end-of-session deliverable

Response Situation Analysis

Creation

- Awareness of all participant's perceptions/experience/needs
- Accepted insightful generic problem understanding
- Requirements for effective generic solution
- Valued participant experience

Improvement

- Brief out value and relevance
- After action follow through on solution development

Migration

- To high-concept system-science focus
- To non-INCOSE venues

Modification of Capability

- Change/replace a topic, and/or moderator

Correction

- Loss of focus on the topic-workshop mission
- Non-convergence on appropriate out-brief
- No-show moderator

Variation

- Experience and knowledge of participants
- Moderator attention to mission

Expansion/Contraction of Capacity

- Number of participants in a given topic-workshop (5-15?)

Reconfiguration

- Participants in crowded workshop moved to sparse workshops

Actionable Lessons Learned

Attendee evaluations received from 31 of 48 attendees, 5 of them students.

- Glad they came question averaged 4.68 out of 5, all 5s and 4s except one 3.
- Do it again question averaged 4.77 out of 5, all 5s and 4s.
- Doing it in October won over August by large margin – 87% vs. 48% (some said either).

Lessons learned:

- Date conflicts: NDIA attendance (would have come) and IS paper submission (marginal).
- Upload brief-outs for immediate access by all – a running proceedings posting.
- All moderators need email access. Can we bring a Hot Spot for all attendees to access?
- Do logistics mail-out: cafeteria info, coffee info, timing, parking, lack of Internet, etc.
- Didn't capture workshop attendee names in 2nd day topic workshop as we should have.
- More brief-out text is better than less for proceedings archive.
- Tell moderators there will be a proceeding, and that flip chart brief-out info is of no value.
- Better planning in creating the session output. Brief outs could be structured better.
- After-action file management (posters and brief-outs) was cumbersome.
- Room assignments need made before badge-program is made.
- More formal format for final brief out was commented multiple times.
- Many people wanted formal breaks.
- Two moderators tipped the student supporter \$20 - good idea but can't be mandatory.
- Some people like going to the Bosque for bird watching, some wanted time to see local sites (eg, SETI antenna array).
- Some people wanted to attend more topics than schedule and time allowed – c'est la vie.
- People liked the student presence and active support-involvement.
- People liked the badge-inserted agenda.
- A few people felt they were too green in SE to appreciate the experienced discussions.
- Major: have someone take pictures.

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