A Few Words First

Audio Connection – Please mute phone (*6 toggle) – or your GM left-side name Upcoming Meetings:

- May 10-11: Tutorial Model Based Systems Engineering Mathew Hause, PTC, Engineering Fellow; Chair OMG SysML V2 submission team
- Jun 13: Best Practices for Achieving Requirements Efficiency Dr. Cheryl Bolstad, Sandia National Laboratories, Human Factors
- Jul 18: Summer Social, 6:00-9:00pm, Shark Reef Café, watch for info
- Sep 20-22: Western States Regional Conference, Ogden, Utah Website: <u>https://incose-wsrc.eventbrite.com</u>, Presentation call open all of March

CSEP Courses by Certification Training International: <u>Course details</u> | <u>Course brochure</u> Upcoming Course Schedule (close by, but many more locations and dates): 2018 Jul 16-Jul 20 | Austin, TX 2018 Oct 15-Oct 19 | <u>Albuquerque, NM</u> -- <u>CANCELED</u> Chapter SEP mentors: Ann Hodges <u>alhodge@sandia.gov</u>, Heidi Hahn <u>hahn@lanl.gov</u>

First slide, not recorded but retained in pdf presentation.

And Now - Introductions

Enchantment Chapter Monthly Meeting



<u>9 May 2018 – 16:45-18:00</u>

Creating Decision Guidance for Applying Agile System Engineering

Ron Lyells, Retired Honeywell, Co-chair Agile Systems & Systems Engineering WG, rlyells@aol.com

Abstract: As awareness of agile system principles begin to take hold, and promulgation of agile software techniques continues, systems teams, projects, and organizations are often faced with the question as to whether they should adapt agile systems practices into their programs and processes. In trying to answer that question, teams are faced with other questions that need to be answered as well. These include what is motivating the decision, where should agile principles be applied and how much agile is necessary. This talk will present work accomplished to date on applying the OODA process, coupled with some simple tools to help teams, projects, and organizations answer those questions.

Download slides today-only from GlobalMeetSeven file library or anytime from the Library at <u>www.incose.org/enchantment</u> NOTE: This meeting will be recorded

Today's Presentation

Things to Think About

How can this be applied in your work environment? What did you hear that will influence your thinking? What is your take away from this presentation?





Ron Lyells is co-chair of the Agile Systems & SE Working Group.

Retired from Honeywell's Aerospace Group, Ron was part of a team responsible for improving System Engineering development effectiveness across the Aerospace organization.

Ron was specifically responsible for developing and promoting MBSE techniques and methods, the roll out of a common

system engineering competency framework, as well as individual and team mentoring, and change management facilitation.

Ron worked in the Aerospace industry 40 years in various leadership positions involved in product development lifecycle stages ranging from proposal to production support.

He holds a B.S degree in electrical engineering from Arizona State University.



Creating Decision Guidance for Applying Agile System Engineering

Ron Lyells

INCOSE Enchantment Chapter, May 9, 2018



- Background and Context
- Observation Space Design
- Evaluation Results and Findings
- Next Steps

Integrating Learning Journeys

CAB Members

- Large
 Variation
- Systems, Life Cycles
- Regulatory Constraints
- Risk Tolerance
- What Agile Means

AGILE SE WG

- Fundamentals
- ASELCM
- Pattern Work







Fundamental Values

- Purpose is to assist teams in making directionally correct decisions
- Solution suitable to address wide range of development applications
- Products created simple to use, quick to use
- Ensure integration with other learning within the agile SE WG community



Decision Guidance Is Really A System

- Scope
- System Elements
- Relationships
- Organizing Framework





Choosing The OODA Loop For An Organizing Framework

Framework For An Information Processing System Whose Purpose Is To Provide A Guide For Action



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OODA State - Observing



Define Observation Spaces

Establish A Set Of Inquiry Tools



OODA State - Orienting



Look For Mismatches Between Situation and Capability

Develop Insight and Understanding



OODA State - Deciding



Make Decisions –

What Strategy To Adopt

Capability Selections What To Improve What To Change



Joe's Story

Think Short Story There are settings There is a hero There is a conflict There is a strategy in play There are other actors

 ✓ Captures the problem space
 ✓ One author but many can weigh in to ensure accuracy
 ✓ Used as reference for assessment





"Easy reading is damn hard writing" Nathaniel Hawthorne



Observation Space Design



Customer Problem Space



Target System Aspects For Assessment

- What drives purpose, timing, and capabilities?
- How Dynamic Is This Space?
- What Kind of Variation Might Be Expected?
- What Capacity Requirements Need To Be Served?



Solution Space

Solution System Aspects For Assessment

- What drives purpose, timing, and capabilities?
- How Dynamic Is This Space?
- What Kind of Variation Is Needed?
- What Capacity Requirements Need To Be Available?



Product Development Space



PDS Aspects For Assessment

- What drives purpose, timing, and capabilities?
- How Dynamic Is This Space?
- What Kind of Variation Is Needed?
- What Capacity Requirements Need To Be Available?
- What Is Nature Of Coupling Between Environments?





Organization Learning Space

Learning Space Aspects For Assessment

- How is new knowledge about processes, practices, products and vision shared?
- How are Organizational and individual mental models of past practices evolved to revised practices?
- What mechanism is used to facilitate team learning?



Form of Assessment

The Prototype Assessment Tool provides important insights into Agile needs





Stability-Predictability Grid Assessment

How Agile do you need to be? This tool highlights four distinct types of dynamic behavior

Frequent changes follow predictable trends example: introduction of a new technology

Changes are infrequent and predictable example: regulatory environment



Predictable Unpredictable

Changes are frequent and unpredictable example: global competitive environment

Changes are infrequent but do not follow trends examples: platform or market innovation

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Evaluation Results and Findings

Stability Predictability Grid



- Goals & Requirements, Challenges & Constraints factors
 - Fall in the upper-right, most dynamic quadrant.
 - Consider project design improvements for faster monitoring and response
- Solution and Development System Factors
 - Fall in lower-right quadrant
 - Monitor for emerging trends
 - Consider Time To Respond

1.00Unpredictable C&C G&R ModSet 0.50SolSet 1.00 0.00 0.50Arch Misn Integ Predictable 0.00 Stable Unstable

S-P Grid - Space Dynamics

Response Capacity



- Construction and Support environments are highly varied and numerous
 - Design project to allow for higher capacity to support concurrent variations
- Goals and requirements and Integration environment are only a little less varied and numerous
 - Project design will have to accommodate adequate capacity to support them



Response Time



- Total Time To Respond = lead-time + time needed to effect a response (which is not in this assessment)
- When total time to respond exceeds change rate, the project will be one or more cycles behind
- Circled factors are too slow, even without considering time to respond
 - Design project with improved monitoring response
 - Improve cycle time of integration activity





Findings – Efficacy On Method

Values	Initial Prototype Experience
Directionally Correct Decisions	Assessment casts a broad net S-P grid mapping allows teams to see/discuss areas to focus on
Wide Range Applicability	Observation spaces not tied to specific industry. Need more trials to prove
Simple and Quick To Use	Effort = story + assessment + mapping = apprx 12-16 hours Basis for group discussion/validation and synthesis leading to decisions
Agile SE Community WP Integration	Agile fundamentals built in Capability portfolio is capture for patterns, examples, life cycles

Invitation and Future Work



- We have a prototype looking for early adopters
 - Create A story, use the assessment, map answers to the S-P grid
 - Use as basis for team/group discussion
 - Support A debrief to the team
 - Make improvement recommendations
- Next work phase work the deciding phase activity of the OODA loop
 - Organizational behavior and service model patterns
 - Form of the playbook
 - Look at populating a capability portfolio with known examples

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Please

The link for the online survey for this meeting is <u>www.surveymonkey.com/r/2018_05_MeetingEval</u> www.surveymonkey.com/r/2018_05_MeetingEval

Look in GlobalMeet chat box for cut & paste link.

Slide presentation can be downloaded now/anytime from: The library page at: <u>www.incose.org/enchantment</u>. Recording will be there in the library tomorrow.