Agile Methodology to Enable Rapid Process Innovation and Improvement

Caitlin Kenney, P.E.
Systems Engineer, ISM Corp

Joan Tafoya
Director, Sandia National Labs

25 February 2020
Performance Excellence Track
New Orleans 2020
31 May-2 June

We designed the Track for:
- Industry Practitioners
- “ISE” function Leaders and Managers
- Young Professionals
- Students

Reasons to Attend:
- Critical, hot topic sessions
- Benchmarking, learn from best in class organizations
- Networking and recruiting opportunities
- Effective, Efficient, High quality and value Learning and Development
- Actionable takeaways to Engineering Value for your Business
<table>
<thead>
<tr>
<th>Track Opening Speaker</th>
<th>Finalist Presentations for the Outstanding ISE Capstone Senior Design Award Competition</th>
<th>Keynote Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juan Perez, CIO at UPS (ISE’s: We Engineer Value)</td>
<td>Best in Class Projects from around the World</td>
<td>James Tompkins, Chairman and CEO, Tompkins International and MonarchFX</td>
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<tr>
<td>Conference Keynote</td>
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<td>Innovation to Drive Operational Excellence A Framework for Integrated Process Innovation Implementation</td>
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<tr>
<td>Pooja Dewan, VP &amp; Chief Data and Analytics Officer, Otis</td>
<td>Andres Medaglia, Universidad de los Andes</td>
<td>Change Management in Military Organizations &amp; Leaning out Proposal Evaluation in the Navy</td>
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<tr>
<td>Executive Roundtable with Keynoter</td>
<td>To Simulate or Not</td>
<td>Guiding and Coaching the Next Generation of Leaders &amp; Mastering Millennial Mindset and Beyond</td>
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<tr>
<td>The Value of Professional Engineering Licensure</td>
<td>Continuing Education and Development Options and Guidance for Young Professionals</td>
<td>Tapping into your Company’s Smart Subconscious</td>
</tr>
<tr>
<td>The Art and Science of Navigating Organizational Politics</td>
<td>The Art and Magic of Disney Data</td>
<td>Improving Maintenance Management</td>
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<tr>
<td>Young Professionals Town Hall—Networking, Mentoring</td>
<td>Successful Women in Industry</td>
<td>The Paradox of Standardization</td>
</tr>
<tr>
<td>CISE, IAB, YP Leadership Mixer and the Capstone Senior Design Finalist Announcement</td>
<td>Finalists for the Outstanding Service Systems Engineering Annual Award</td>
<td>Upgrading Performance Management</td>
</tr>
<tr>
<td>IAB/YP Informal Networking Event</td>
<td>Putting the Fast in your Food: Upstream Ordering Technique</td>
<td>Treasure Hunting: How to Find and Leverage Hidden Talent</td>
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<tr>
<td>Industry Advisory Board Town Hall—Speed Networking</td>
<td>Industrial Engineering Toolkit in Operations Restructuring</td>
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Caitlin Spargo
Systems Engineer at International Systems Management Corp.

Joan Tafoya
Director, Sandia National Labs

https://attendee.gotowebinar.com/register/4639163216712293379
Are the right tools in your tool box?

ISE’s have been taught many tools and processes for improvement.

Do you have one that:

- Embraces changing requirements?
- Continually adds value to the customer?
- Strengthens team collaboration and performance with built in continuous learning?

Agile Methodologies may be the next tool you should add to your box.
**What kind of world do you live in?**

**Does this sound like the “typical day”?**

<table>
<thead>
<tr>
<th>Market Environment</th>
<th>Market conditions are <strong>stable</strong> and predictable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Involvement</td>
<td><strong>Requirements are clear</strong> and will remain stable. Customers unavailable for constant collaboration</td>
</tr>
<tr>
<td>Problem Type</td>
<td>Problems can be <strong>solved sequentially</strong> in functional silos. Similar work has been done before</td>
</tr>
<tr>
<td>Innovation Type</td>
<td>Detail specifications and work plans can be <strong>forecasted with confidence</strong></td>
</tr>
<tr>
<td>Modularity of Work</td>
<td>Customers cannot start testing parts of the product until <strong>everything is complete</strong>. Late changes are expensive or impossible</td>
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</table>

**Name:**
Paula Production

**Job Role:**
Production Line Supervisor

**Typical Day:**
I start early to get a pass down from the night shift. We assess our performance to the weekly output goal and adjust plans. I set direction for the line workers on priority areas and production targets. Frequently I’m called to help with unplanned events.

**Pain points:**
Down equipment, raw inventory not arriving on time or not of the quality needed.

Source: HBR “Embracing Agile”, May 2016
What kind of world do you live in?

Or is this more of the “typical day”?

**Name:**
Diana Development

**Job Role:**
Product Development engineer

**Typical Day:**
My team is working on the next generation multi-rotor drone. We start our day off with a ‘daily stand up’ to share what we have done yesterday, what we plan to do today and help needed. I then spend my day either designing experiments or creating prototypes to test ideas.

**Pain points:**
Getting time in the lab to build prototypes. Addressing customer complaints that the field can’t resolve – it takes away from development time.

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<th>Customer preferences and solution options change frequently</th>
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<td>Problems are complex, solutions are unknown and scope isn't clearly defined.</td>
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<td><strong>Innovation Type</strong></td>
<td>Creative breakthroughs and time to market are important</td>
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<td><strong>Modularity of Work</strong></td>
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Source: HBR “Embracing Agile”, May 2016
Agile may be a better way to work for your world

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<th>Agile</th>
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<td>Impact of mistakes</td>
<td>They may be catastrophic</td>
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<td>Examples</td>
<td>sales calls, accounting, manufacturing processes, equipment maintenance</td>
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| Source: HBR “Embracing Agile”, May 2016
Agile Values and Principles

Born in 2001 from the necessity in the changing software landscape, thought leaders brought forth the *Agile Manifesto*.

**Individuals** and **Interactions**
over **Processes and Tools**

**Working Prototypes**
over **Excessive documentation**

**Customer Collaboration**
over **Contract negotiation**

**Responding to Change**
over **Following a plan**
Agile approach umbrella

Scrum
Lean software development
Kanban (process + method)
Extreme Programming (XP)
Continuous Integration (CI)
Continuous Delivery (CD)
Feature Driven development (FDD)
Test Driven Development (TDD)
Crystal Clear

Scrum-of-Scrums
Scrum at Scale (Scrum@Scale)
Large-scale Scrum (LeSS)
Scaled Agile Framework (SAFe)
Disciplined Agile Delivery (DAD)
Dynamic Systems Development Method (DSDM)
Agile Project Management (AgilePM)
Agile Unified Process (AUP)
Open Unified Process (OpenUP)

Lightweight approaches
Fuller approaches (beyond 1 team)

Source: https://www.mindmeister.com/443624561/scrum-study-guide-mind-map
Where does your typical problem land?

- **Agile Methods**
- **Lean Startup**
- **Waterfall**
- **Lean Kanban**
Where does your typical problem land?

- **Agile Methods**
- **Lean Startup**
- **Waterfall**
- **Lean Kanban**

**Problem**
- Known
- Unknown

**Solution**
- Known
- Unknown
Scrum vs Waterfall in Project Execution

**Waterfall**

- Requirements (fixed)
- Design
- Development (gate)
- Testing (gate)
- Deployment

**Scrum** (an Agile methodology)

- Requirements (variable)
- Design
- Development
- Testing
- Deployment

**Cumulative outcomes**

**Big outcome at end**
Scrum is the most widely practice method in the Agile Framework. Let’s dive into that practice a bit more.
Agile Scrum: An overview
Agile Scrum: An overview

Inputs from Executives, Team, Stakeholders, Customers, Users

Product Owner

The Team

Product Backlog

Ranked list of what is required: features, stories, ...

Sprint Planning Meeting

Team selects starting at top as much as it can commit to deliver by end of Sprint

Task Breakout

Sprint Backlog

1-4 Week Sprint

Sprint end date and team deliverable do not change

Source: Neon Rain Interactive – Agile For All
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1-4 Week Sprint

Task Breakout

Burndown/up Charts

Scrum Master

Every 24 Hours

Daily Scrum Meeting

Source: Neon Rain Interactive – Agile For All
Agile Scrum: An overview

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Ranked list of what is required:

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Sprint Backlog

1-4 Week Sprint

Sprint end date and team deliverable do not change

Sprint Review

Finished Work

Daily Scrum Meeting

Scrum Master

Burndown/up Charts

Every 24 Hours

Source: Neon Rain Interactive – Agile For All
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Daily Scrum Meeting

Every 24 Hours

Scrum Master

Burndown/up Charts

Sprint Review

Finished Work

Sprint Retrospective

Source: Neon Rain Interactive – Agile For All
The Language Differences

- Translating traditional project management language to Scrum methods

<table>
<thead>
<tr>
<th>Project Manager Says…</th>
<th>Scrum Master Says…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule</td>
<td>Sprint</td>
</tr>
<tr>
<td>Work break down structure</td>
<td>Task breakdown (from user stories)</td>
</tr>
<tr>
<td>Plan</td>
<td>Define the backlog and plan the sprint</td>
</tr>
<tr>
<td>Execute</td>
<td>Develop and test</td>
</tr>
<tr>
<td>Monitor and control</td>
<td>Daily standups, adjust the stickies</td>
</tr>
<tr>
<td>Close</td>
<td>Demo, Retrospective</td>
</tr>
<tr>
<td>Estimate to complete</td>
<td>Burn down chart</td>
</tr>
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</table>
Sunday, 31 May 2020, 3:30 – 4:50pm

3 Agile Activities

• Learn to write user stories
• Learn to assign story points (estimating effort)
• Learn about release planning and how to build a sprint

2 Case Studies from Industry
Agile Scrum is a Mindset, not an Activity

Doing Agile Scrum ≠ Being Agile Scrum

~20% benefit
✓ Ability to manage changing priorities
✓ Improved visibility to work
✓ Increased productivity
✓ Improved quality
✓ Reduced risk

~3X benefit
✓ Customer delighted
✓ Joy of work
✓ Strong team engagement
✓ Time for innovation
✓ Continuous learning

Innovation
Growth Mindset – looking toward future

Trust relationships
25 Feb -- Agile Methodology to Enable Rapid Process Innovation and Improvement (Joan Tafoya and Caitlyn Kenney)

19 March 2020: *Creating Cultures that Support Full Potential Performance/Operational Excellence.*

22 April 2020: *Best of Best ILSS Certification Capstone Project Case Studies*—select from OSU Med Center, Hirschvogel, Abbott Nutrition, Columbus City Schools, Sutphen, and others.
March 2020: Creating Cultures that Support Full Potential Performance/Operational Excellence.
Sreekanth Ramakrishnan, IBM and David Poirier, The Poirier Group.

Another overview (50 minute webinar) of an 80 minute session that will be delivered in May at the IISE Annual Conference. David Poirier and Sreekanth Ramakrishnan will discuss case examples (Loblaws, Hudson’s Bay Company, MDS, Int’l and IBM) of how ISE initiatives included Culture Transformation to support larger, system wide Enterprise Transformations.

https://attendee.gotowebinar.com/register/2259980584644846093
The Agile Scrum Process for Process and Product Improvement

Process improvement projects whether they are DMADV or DDOV/SMADM or business process reengineering typically take far longer than business desire or require. This is true for product as well as service process development.

The Industry Practitioner Track Orlando 2019: Sneak Preview

This is an sneak preview of the Performance Excellence Track, which is focused on industry practitioner concerns, May 18-21 at the IIESE Annual Conference & Expo in Orlando, Florida.

Becoming a Change Master

Change Masters are those professionals (IES) who envision what is possible, are adept at crafting strategies to optimize performance, skilled at managing energy (offsetting entropy), and capable of modeling people and resources to achieve full potential performance.

Smart Supply Chains and Industry 4.0

In this webinar, Industry expert and past president of IIESE, Jim Tompkins will provide a high-level overview of how "Industry and Supply Chain 4.0 is impacting how supply chains are managed. This is an opportunity for all IIESE' s to work on the T-Model Professional Development; keep broadening your knowledge and understanding of our field.

The Impact of Industry 4.0 on Business Models

On Oct. 11, IIESE hosted a webinar that introduced Industry 4.0 and launched a webinar series on this very broad and important subject. This webinar will examine the impact of Industry 4.0 on business models: more specifically product service systems, servitization, and smart systems.

Creating and Ensuring Superior Client Experience

During this webinar, the presenter will discuss approaches that organizations can take to ensure superior (customer, stakeholder) experience. He will build on his work and presentation in 2012 for IIESE that focused on cultural modeling and shaping to support lean transformation effectiveness and improved outcomes for organizations.

The ISE Role in Service Systems Engineering: Service 4.0 Overview, Digital Transformation in Healthcare and Enterprise Shared Service Industry 4.0 is a concept that is becoming well socialized and understood. The ISE role in this ongoing transformation is well established. A similar transformation is occurring in service systems. That transformation, which some are calling Service 4.0, is less well understood and for sure the role is much less well defined. The Service Systems Engineering “Community” in IIESE has joined forces with Chapter No. 1, and created a series of webinars that will launch on the Nov. 6 continua: Bus 2019.

Whetting your Appetite (“Aperitivo”): All You Need to Know about Industry 4.0

ISE is a very diverse professional society with many young/early career professionals. Our Manufacturing and Design Division has teamed with Chapter No. 1 (Columbus) and the Council on Industrial and Systems Engineering (CISE) to provide a “foundational” webinar on Industry 4.0 and National Network for Manufacturing Innovation (NNMI).

Senior ISE Leaders Share Learnings from Career and Life Chokepoints

The Council on Industrial and Systems Engineering is a small group (22) of very senior ISE Leaders that meet twice a year to benchmark and continue to learn and develop. One of the ways CISE serves the profession, institute and our members is to provide periodic webinars where a small group of CISE members share life and career lessons and tips.

Achieving Full Potential Performance: Managing Transformations in Yourself, Others, in Teams and Organizations

This webinar is focused on consolidating a great deal of research, experience and wisdom-sharing literature into practical bite-sized chunks, which will help you balance your ISE knowledge and skills with “blended mimosas”, soft, change leadership and management, and persuasion skills.

Operational Analytics for Integrated LeanSigma Process Improvement Projects Part III

Part III of our Operational Analytics Webinar Series will capture the first three parts, bring it all together. We will discuss comprehensive case examples of the Data Manager Role (Part II) and the Decision Support Analyst Role (Part III) come together in DMADV and/or DDOV type Process Improvement Projects. We’ll have project leaders on the webinar, who as a panel format and will engage the audience in Q&A.

Operational Analytics for Integrated LeanSigma Process Improvement Projects Part IV

Part IV of our Operational Analytics Webinar Series focuses on the Decision Support Analyst role. We will review summarize parts I and II, and then zoom in on the art and science of creating powerful visualizations that can accelerate improvement decision making and action taking.

Integrated LeanSigma Certification: Project Cost Studies

This webinar will share three integrated LeanSigma process improvement projects that were completed as part of the Certification Capstone in IIESE at Ohio State.

Operational Analytics for Integrated LeanSigma Process Improvement Projects Part V

Part V of our Operational Analytics Webinar Series focuses on the data management role of an ISE in a process/performance improvement project. Frederic will lead by sharing a data modelling process that ensures you have the right data and facts to support sustained process improvement.

Engaging Employees in Operational Excellence: 2-Second Lean Case Studies

Effectively engaging employees in continuous improvement is a goal that most organizations aspiring for improvement want and need. There are many ways to achieve this, Paul Kers has made 2-Second Lean popular and has provided great guidance on how to pull this off.

Career and Life Choice Points

By member request, CISE offered a webinar on September 12 that focused on this topic presented by Joan Talley with Intel, Steve Savino with GM and Scott Sinkwitz with OSU. CISE feels that this offering has extended value for our members and we feel it “nicely filled the model and did three more for CISE members.”