Agile & Business Process Management 4.0:

Presenter today

D. Scott Sink
Program Director Global Performance Excellence, IISE

Our Presenter and Panelists 15 March:

Jared Frederici, Sr. Consultant, The Poirier Group
Eduardo Toledo, VP Business Excellence, Flex

15 March 2022

12 July 2022
PURPOSE:
To build on the Perspectives and Points of View on the evolution of Industry 4.0 and more specifically what’s called Business Process Management 4.0 that were shared 15 March 2022. Specifically, to add in how Agile Principles and Methods can be integrated into the continued evolution of Operational Excellence and Business Process Management.

11:30  Tee-up
    Quick Intro to BPI, Op Ex and Agile

11:40

12:00  The Integration of Agile and Op Ex/ BPI

12:25  Scott Close out and Adjourn
You’ll find our Op Ex Webinars here


IIESE PERFORMANCE EXCELLENCE WEBINARS

Boost your career. Add knowledge to your ISE toolkit. Select from any (or all) of the IIESE Performance Excellence Webinar tracks below to hone your skillset to its maximum and improve your organization.

Performance Excellence topics include ...

- Accelerating Benefits Realization
- Best Practice Case Studies
- Career and Leadership Development
- Change Leadership and Management
- Industry and Service Systems 4.0
- Integrated Lean and Six Sigma
- Operational Analytics
- Operational and Business Process Excellence
- Personal and Professional Mastery

Accelerating Benefits Realization

Dive into agile and other methodologies that speed up operational results and bottom line impact.

- Implementation Sciences and Benefits Realization Management
- Operational Analytics: How it Supports Business Cases, Evaluation Studies, Benefits Realization Confirmation
- Disruptive Innovation in Distribution: From Weeks to Days to Hours
- Agile Methodology to Enable Rapid Process Innovation and Improvement
- The Agile Scrum Process for Process and Product Improvement
- Rapid (AGILE) Deployment and Execution of Integrated Systems Engineering Principles and Methods in Times of Major Disruption

Industry and Service Systems 4.0

Explore the major “movements” and hear thought leaders in Industry 4.0, Healthcare 4.0, Supply Chain 4.0, Service Systems 4.0, more.

- Business Process Management 4.0/5.0: Perspectives and Points of View to Migrate to Higher Levels of Operational Excellence
- Integrated Systems Engineering: Thought Leader Perspectives and Points of View
- Supply Chain 4.0: Cold Supply Management Vaccines Case Focus
- Using ‘Control Towers’ to Integrate your Digital Supply Network
- Supply Chain 4.0: Benchmarking to latest innovations in Logistics and Supply Chain Leadership and Management
- Service Systems Engineering Best Practice Virtual Benchmarking
- Service Systems Engineering: Outstanding innovation
- The Industry Practitioner Track Orlando 2019: Sneak Preview
- Smart Supply Chains and Industry 4.0
- The Impact of Industry 4.0 on Business Models
- The ISE Role in Service Systems Engineering: Service 4.0 Overview, Digital Transformation in Healthcare and Enterprise Shared Service
- Whetting your appetite (“Apertivo”): All you Need to know about Industry 4.0

Operational and Business Process Excellence

Some organizations integrate Business Process Excellence perfectly. Others need a well-designed program. We’ll show you how to jump start a great Op Ex Program.

- IIESE Annual Conference 2022: The Performance Excellence Track Detailed Preview
- The New Industrial Engineering: Integrated Systems Engineering and Management Systems Engineering
- Building Performance Management Systems: Sharing Lessons Learned
- Business Process Management 4.0 – Glimpses of What’s Ahead
- Engineering Social Service Systems
- Operational Excellence: Creating Strategies and Migration Plans for Large Scale Improvement Initiatives
- Industry Benchmarking: Small and Medium Sized Enterprises Best Practices in Operational Excellence
- How to Design, Develop and Execute “Flow Workshops”
- Principles and Tools to Ensure Optimal Process Performance
- IIESE Outstanding Capstone Senior Design Projects
- Engineering and Engineering a New World
- Resilience Re-examined: Re-engineering How We Do Business and Ensure Public Safety
- Restarting the Economy: Guidance on the Backside of the Disruption
- Business Continuity Strategies and Tactics in Periods of Major Disruption
- Navigating Your Business Through the COVID Crisis
- Creating and Ensuring Superior Client Experience
- How to Create People Centered Operational Excellence Strategies
- Diversity, Equity, and Inclusion: Progress and Performance Assessment from an ISE Perspective
- Creating Cultures that Support Full Potential Performance/Operational Excellence
- IIESE Performance Excellence Event of 2020: Sneak Preview

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The New Industrial Engineering: Information Technology and Business Process Redesign

Those aspiring to improve the way work is done must begin to apply the capabilities of information technology to redesign business processes. Business process design and information technology are natural partners, yet industrial engineers have never fully exploited their relationship. The authors argue, in fact, that it has barely been exploited at all. But the organizations that have used IT to redesign boundary-crossing, customer-driven processes have benefited enormously. This article explains why.

Seminal Article that shared a vision for the direction that ISE has been moving.
ISE’s Create Value by Integrating People, Strategy, Process and Technology

The Requirement for the rate of Improvement of this Integration has been changing dramatically.

ISE’s are well suited (trained) to help ensure Business Process Improvement happens faster and better!
It’s not IF you are Innovating it’s how FAST you are Innovating that Matters…..

And, **Jumping from one Curve** to the next is often a critical to Success Factor.

Learning how to Master ‘speed’, flexibility, rapid communication and coordination and how to reduce latencies is super critical.

The Purpose of this Webinar Series is to explore all the things that can be done in Op Ex to reduce Latencies and Accelerate Benefits Realization.
20’s style Operational Excellence Programs are a product of well over 100 years of ‘design and development’

A BRIEF -HOWEVER COMPLEX- HISTORY OF LEAN
Several branches & trends influence its evolution

Evolution began with the founding of Industrial Engineering circa turn of 20th Century

Branches evolved in Lean and TQM then into Integrated LeanSigma and now into Integrated Systems Engineering:

Enterprise Wide Operational Excellence Programs
Flex Lean Six Sigma Journey—from our 15 March Webinar

Establish an Agile Continuous Improvement Management System that enables Flex Forward and ensures Flex is a valuable partner to improve the world.

Lean 0.0
Lean Office
Lean Supply Chain
Lean Operations
Lean Six Sigma 4.0
Agile CI
KTBN with Finance
Jidoka
Just-in-Time (JIT)
Heijunka
Setting Foundation
Commit to Deliver

Lean 2.0
Lean Office
Lean Supply Chain

Lean Six Sigma 4.0

Agile Continuous Improvement

Kaizen to Business Needs

Lean 2.0

• End-to-end business process
• Customer / Supplier Engagement

Lean Office

• Streamline office processes

Lean Supply Chain

• End-to-end supply chain processes

Heijunka

• Level Loading
• Sequencing

Jidoka

• Poka Yoke
• Stop @ Abnormalities

Just-in-Time (JIT)

• TAKT Time
• Single Piece Flow
• Pull Production

Training
• Leadership

Change Management
• Supermarket

• Value Stream Map
• 5S + 1

Quick Changeover

Setting Foundation

• Quality
• Cost
• Delivery
• Responsiveness

Productivity
• Visible Difference
• Efficiency
• Speed

Assets Velocity
• People Empowerment
• Lead Time Reduction
• Pristine Ramp, Transfer & Startups

Environment (CSER)
• Loss Prevention
• System Migration

Commit to Deliver
The ‘nature’ of organizational systems is evolving... much of this evolution is ‘driven’ by the ‘10 Laws of Technology’ (hyperconnectivity) that are altering how we work and relate and how value is created...
Quality has been the focus of much Performance Improvement thought and effort but BPM 4.0 is much, much broader and pervasive/ubiquitous.

Think about this beyond just Quality:
- Effectiveness
- Efficiency
- Productivity
- Quality of Work Life
- Innovation/Learning
- Profitability
- Sustainability

Here is an example of the Integrated Quality Management System.
The focus today is on how we bring all these pieces together, get them to work together better, improve the integrated system, drive benefits realization faster from the integrated system.
The New Industrial and Systems Engineering spans the full spectrum of Business Process Management Endeavors.
Brief overview of the evolution of Agile

2001

Agile is Born
17 techies meet in Utah, develop Agile Manifesto

2007

Steve Jobs Intros First iPhone @ MacWorld
“Multi-touch... it works like magic... and boy have we patented it.” - Steve Jobs

2008

Mobile App Stores Launch
Apple® App Store® launches in July, and Android Market launches in August 2008

2010

DevOps is Born
Patrick Debois and Andrew Schafer only attendees at “Birds of a Feather” session at Agile Conference in Toronto

Smartphone Usage Grows
Majority of Americans have smartphones

2012

Agile Moves into Rapid Adoption
Agile hits inflection point, adoption takes off

2013

149 Billion Mobile Apps Downloaded Worldwide
Mobile apps become preferred information source

2016

“The Phoenix Project”, by Kim, Behr & Spafford Published
Fictional novel about IT, DevOps, and Helping Your Business Win

2018

352.9 Billion Mobile App Downloads Projected
Organizations Tackle DevSecOps

2021

DevOps Adopted by Majority of Enterprises
Forrester refers to 2016 as “The Year of Enterprise DevOps”

Digital Transformation

Digital Business
Brief overview of the evolution of Agile

The essential distinction is really how we manage smaller chunks of work, do we do concurrent engineering/build when we can, how we tailor Agile Principles to Business Process Improvement.
What really dictates which ‘development’ approach is ‘right’?

Why we have swim lane flow maps
Merchandising Team Integration BPI... “Transforming Current State to Operational Excellence”

- Time: Feb 1
  - Corporate Level Planning & Marketing
- Time: Mar 1
  - Category Strategy Development Process
  - Finance meets with Sr. Merch. for sign-off on category targets. Sr. Merch. assigns to DVP’s / VP’s.
  - VP / DVP meet with team and discuss category targets and ask Buyers and Planners to come up with plan and tactics.
- Time: Mar 15
  - Commodity Budget & Planning Line / Assortment (Seasonal)

**PLANNING**
- START
  - AVP Planning obtains corporate strategy / marketing from CEO/CFO
  - AVP Planning and Sr. Merch. meet to discuss conceptual plan
- END
  - Trend / Pre-Line Review

**MARKETING**
- Corporate Direct Planning
- Strategy finalization is critical during this period as this will mitigate rework further downstream.
- Category Marketing Strategy
- Corporate Direct Planning

**FINANCE**
- Sends Sales, baseline trend, and Merch. Margin for next year to AVP Planning for Retail & Direct
- Sends inventory targets for year to AVP Planning

Operational Definitions
Process RACI

Category Strategy Development
Consider getting a house built...

- It’s a perplexity if you’ve never built one, even more so if you’re not ‘building’ inclined....

- It’s a project if you do it once. And for the most part it involves a lot of sequential interdependence...
  - Have to find the lot before you can survey and clear it
  - Have to lay the foundation before you can frame

- At points in the project there are some chunks of the work breakdown structure that can happen concurrently (e.g. can plumb and wire at same time, might even be advantages), so the nature of the interdependency shifts and how we manage the work also needs to shift.
  - MS Project Plans, slack, starts-stops, resourcing, delays, etc. generally waterfall works

- It’s a process if I do a number of house builds and the nature of the interdependencies I have to manage shifts dramatically if I’m building a bunch at the same time, I end up with much more complexity than sequential, assembly line process. That’s where just waterfall breaks down.

- Most often we're faced with some sequential interdependence but often what’s called mutual Interdependence or team dynamic interdependence. This is where more communication is required to support more complex coordination. Agile and Huddles work best in these situations.
I thought this visual did a pretty good job explaining key differences

<table>
<thead>
<tr>
<th>Agile Development</th>
<th>Waterfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous cycles</td>
<td>Sequential/linear stages</td>
</tr>
<tr>
<td>Small, high-functioning, collaborative teams</td>
<td>Upfront planning and in-depth documentation</td>
</tr>
<tr>
<td>Multiple methodologies</td>
<td>Contract negotiation</td>
</tr>
<tr>
<td>Flexible/continuous evolution</td>
<td>Best for simple, unchanging projects</td>
</tr>
<tr>
<td>Customer involvement</td>
<td>Close project manager involvement</td>
</tr>
</tbody>
</table>
The biggest differences in the Domain of BPI and Op Ex, to me, are...

**Traditional Program and Project Management**

- create a project plan and work the plan using project management tools and methods.
- focus on IMS (Integrated Management Systems)—e.g. detailed MS Project Plans and stick to plan. Heavy traditional project management.
- have a PMO to coordinate all the projects.
- Communication and Coordination between projects is often limited, an issue.
- Lots of administrative intensity.

**AGILE +++**

- create an Integrated Master Plan (IMP) with a significant focus on making sure DONE is clear, compelling, aligned, committed to.
- treat the ‘chunk of work’ as a ‘Scrum’ with sprints (Agile language).
- create Tiered Huddles to promote the right level and quality of communication within and between teams—focus on coordination and cooperation of key interdependencies (Critical Alignment Points)
- integrate Measure What Matters and the Objectives & Associated Key Results (OKR) method
- hold disciplined Reviews and Retrospectives
- More meetings but less administrative intensity.
I’m going to zoom in on IMP vs IMS at this point because it’s so central to Agile BPI and Op Ex


What is an IMP?

- An event-driven plan for executing the program
- Not a calendar based plan
- Becomes a contractual document (or Commitment in our case)
The Way the IMP Works!

Event

Supporting Accomplishments

Supporting Criteria

Event readiness or completion provides a measure of progress

First Flight!

First Flight Readiness Review Complete

Usually there are multiple supporting accomplishments for each event

Usually there are multiple supporting criteria for each accomplishment

• SEEK EAGLE Flight Clearance Granted
INTEGRATED MASTER PLAN vs. INTEGRATED MASTER SCHEDULE

- **INTEGRATED MASTER PLAN (IMP)** – provides a single plan describing the fundamental structure of the program

- Focuses the integrated product team (IPT) team on the customer requirements through deliverables rather than through TASKS

- Establishes an agreement between all members of the IPT on these deliverables

- Defines the program in terms of EVENTS, ACCOMPLISHMENTS, and CRITERIA for these accomplishments

- Establishes the CRITERIA and objectives for program success

- **INTEGRATED MASTER SCHEDULE (IMS)** – provides a TASK and calendar based schedule at a level necessary for day-to-day execution of the program (this is similar to a Gantt Chart or WBS)
Simple Overview of the IMP/IMS Relationship

**INTEGRATED MASTER PLAN (IMP)**

- **EVENT based Plan**
- "Contractual" document
- Relatively top level

**INTEGRATED MASTER SCHEDULE (IMS)**

- **TASK & calendar based Schedule**
- Level of detail necessary for day-to-day execution
**Significant Accomplishment CRITERIA (AC)**

- **Significant Accomplishment CRITERIA provide the definitive evidence that a specific accomplishment has been completed**

- **Significant Accomplishment CRITERIA must:**
  - Measure success or process maturity over time
  - Provide objective, explicit proof of completion
  - Highlight specific areas of effort for tracking, monitoring risk, or incrementally verifying a process of product
  - Relate directly to ACCOMPLISHMENTS (earned value)
  - Answer “how do I know when a ACCOMPLISHMENT has been completed”
  - Focus of EXIT CRITERIA
  - Express ENTRANCE CRITERIA as predecessors in the IMS
EVENT & SIGNIFICANT ACCOMPLISHMENT evaluation CRITERIA

- Do the EVENTs and ACCOMPLISHMENTS reflect the logical evolution and progress of the Program/Project/Sprint?
  - Do the EVENTs demonstrate the maturity of the initiative over its life?
  - Do the Accomplishments and CRITERIA identify meaningful and measurable progress toward key goals (DONE)?

- Do the ACCOMPLISHMENTS of each EVENT demonstrate an understanding of the requirements or are they simply generic TASKS?
  - Do these ACCOMPLISHMENTS reflect the Statement of Work?

- Does the IMP structure map to the IPT structure so each IPT member knows their scope of responsibility?

- Is visibility provided to track risk and risk mitigation steps?

- After award, can the ACCOMPLISHMENTS be used as activity cost accounts for the EVMS (Earned Value Management System) system?
ISE has to shift the paradigm—BPI and Agile make the Not Possible become a Reality—just have to know how to do it.

Good doesn’t have to be expensive.

Cheap is affordability, meeting cost/price requirements, can have good and affordable.

Can have fast and affordable.
The answers lie in these elements, components of Agile and The New Industrial and Systems Engineering:

- Strategic Performance Improvement Planning and Deployment
- Integrated Master Planning AND Integrated Master Schedules
- OKR Methodology (Objectives and Associated Key Results) (Doerr)
- Agile—Scrums/Huddles (Tiered), Sprints, Reviews, Retrospectives
- Visual Measurement/Management Systems—Huddle Boards
- Disciplined Program Management—Reviews and Retrospectives to reinforce discipline, accountability, team work, alignment
The Opportunities and Challenges I’ve experienced the past 20 years in my Op Ex and BPI/R Roles:

Let’s focus briefly on the Strategizing and Planning component.

1. Strategy Alignment and Leadership Continuity—Shared Vision Creation Process issues

2. Alignment to Migration Strategies and Plans—Agile PMO and BPI capabilities lacking

3. Change Leadership & Management Skills and Execution Discipline

4. Learning Organization issues, Competency Improvement System ad hoc

5. Not Mastering Integrated Master Planning, OKR, Agile, Huddles as an integral part of the Implementation and Deployment Process
This is the Contextual Big Picture that frames Operational Excellence

A--What Are Our Aspirations?
- Shared Visions
- Purpose & Values
- Current Portfolio
- Current Domain

B--Where We Play?
- Market Segments
- Customers
- Parts of Value Chain
- Geography

C--How We Win?
- Solutions Provided
- Populations Served
- Technologies Employed

D--What Capabilities Must Be in Place To Win?
- Enterprise Strategy
- Stakeholder Value Propositions
- Trusted Partner
- Innovative and Responsive

E--How Do We Get There?
- Core Competencies
- Capability Gaps
- Unmet and Unfulfilled Client Needs

Agile Competencies
- Pick the Right People
- Invest in People
- Grow the Right Competency Portfolio
- People, Strategy, Process, Technology

Enterprise Strategy
- Strategy
- Competitive Positioning
- Competitive Advantage
- Value Proposition
- Differentiation

Technology Accelerators
- Right people in right seats on bus
- Competitive Competencies and Right Mix
- Effective and Efficient Business Processes

Strategic Initiatives
- Execution Plan
Why is the Concept of Agile and Reviews & Retrospectives Important?

They reflect behaviors that build Learning Organizations.
They reflect behaviors that create Full Potential Performance Organizations….
Enterprise Transformations, Op Ex Programs, and just PDSA Systems all use something like this.....KEY QUESTION—how to do this fast, AGILE?

1. Strategy and Policy Formulation--Prepare to Plan (compiled in a Fact/Info Book)
   - A: Mandate
   - B: Foundational Elements
     - B1: Purpose and Vision
     - B2: Domain Definition
     - B3: Values & Operating Principles
     - B4: Strategies and Plans
     - B5: S.W.O.T.
     - B6: Long Range Hypotheses
     - B7: Current and Past Performance
     - B8: Current and Past Improvement Initiatives
     - B9: Current Strategy for Success (if implicit, make explicit)
     - B10: Assumptions
     - B11: Personal Mastery and Team Development

2. Planning Process
   - C: Shared Vision Narrative
   - D: Current Reality
   - E: Gap Analysis
   - F: Goals, Objectives, Frontal Initiatives
   - G: Plan Development
   - H: Plan Communication (Ongoing Process)
   - I: Deployment
     - I: Implementation
     - J: Implementation
   - K: Progress & Performance Reviews (Accountability Mechanisms; Personal Mastery, Team Learning, Statistical & Systems Thinking, Mental Models, Shared Vision and Strategy ongoing development)

3. Implementation, Deployment, Study, Adjustment/Improvement Process

This is the ‘framework’, roadmap, that we developed while at MDS for building strategic plans for our Businesses (Diagnostic Services was the guinea pig).

It can and needs to be tweaked but it works and is a reasonable roadmap to follow.
The plan(s) that are products of that process get mapped into this System Structure for Deployment, Implementation, Study-Adjust...

A Graphic Illustration of the Infrastructure for Enterprise Transformation and Op Ex Programs....

**Mission, Vision and Guiding Principles**

**Corporate Strategic Objectives**

**PEOPLE**
- High Perf Employees
- Culture & Climate
- KRA’s e.g. OCI

**STRATEGY**
- Strat Perf Imp Planning
- KRA’s SPiP PML
- KRA’s Extent of deployment of Agile and Continuous Improvement

**PROCESS**
- Deployment
- PBS
- VSO’s
- PML
- Migration Plan
- Tech Acceleration

**TECHNOLOGY**
- KRA’s PML’s for VS’s and key Processes
- KRA’s Quality of Future State and Migration Plan for Tech Enablement
- KRA’s Rate at which new Tech Innovation is taking place

**Business Process (Cross Functional)/Functional Unit Objectives**

**Process & Dept. Level Objectives & Huddles**

**Leadership & Governance Foundation**
The Opportunities and Challenges I’ve experienced the past 20 years in my Op Ex and BPI/R Roles:

Let’s discuss Competency Development briefly

1. Strategy Alignment and Leadership Continuity—Shared Vision Creation Process issues

2. Alignment to Migration Strategies and Plans—PMO and BPI capabilities lacking

3. Change Leadership & Management Skills and Execution Discipline

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• 2 Aug—Designing and Building Successful Tiered Huddle Systems

• 16 Aug—Tackling Competency Improvement—Perspectives and Points of View

• 13 September—Final Four ISE Capstone Senior Design Project Case Studies

And don’t forget IISE’s new Operational Analytics Certification Program...
We ARE Integrated Systems Engineers

Change Leadership & Management
- Learning Org
- Creation Skillfulness
- Team Development
- Prog/Proj Mgmt.
- Governance & R2A2

Motivation
- Leadership
- Full Potential, Ideal Behaviors
- Creating Full Potential Cultures
- Pers & Prof Mastery
- Human Factors Engineering

People BOK/S
- Wholistic Design
- Design for Integrated LeanSigma
- Visualization Sciences

Solution Design
- Sys Eng V-Model

Technology Enablement
- Integrated Tech Enablement
- Operational Analytics
- Bus Process Mgmt 4.0
- Strategic Benchmarking 4.0

Strategy
- Strategy Development
- Implementation & Deployment
- Alignment
- Discipline
- Intention

Process
- Flow & Capacity Improvement
- Operational Excellence
- Measurement Systems
- Integrated LeanSigma
- Value Stream Engineering

Begins with Trust
Ends with Results

Involves Multi-Disciplinary
Best of Best Talent:
ISE, ChemE, MBA, SCM, Op Ex, Healthcare, Finance,
Speed to Benefits Realization Requires a new kind of Learning Organization....
Let’s start with the hardest part, building the competencies for BPI and Agile.

BLOOM’S TAXONOMY

- **Remembering:** Arrangement, Choose, Copy, Define, Describe, Draw, Duplicate, Find, Identify, Label, List, Locate, Match, Memorize, Name, Write
- **Understanding:** Outline, Quote, Recall, Recite, Record, Relate, Repeat, Reproduce, Select, Show, Spell, State, Tell, Write, Underline
- **Applying:** Apply, Appraise, Build, Calculate, Carryout Change, Choose, Classify, Code, Complete, Comply, Construct, Contrast, Criticize, Demonstrate, Develop, Diagnose, Dramatize, Employ, Estimate, Experiment, Follow, Follow up, Identify, Illustrate, Interpret, Interview, Make use of, Manipulate, Model, Modify, Operate, Organize, Plan, Practice, Produce, Relate, Report, Respond, Retain, Schedule, Screen, Select, Shop, Sketch, Solve, Utilize, Use, Write
- **Analyzing:** Advertise, Analyze, Appraise, Assume, Audit, Breakdown, Categorize, Classify, Compare, Conclude, Conduct inventory, Contrast, Criticize, Debate, Differentiate, Discover, Discriminate, Distinct, Distinguish, Divide, Edit, Examine, Experiment, Inspect, Investigate, Order, Participate, Plan, Outline, Paraphrase, Predict, Recognize, Relate, Rephase, Report, Restate, Review, Rewrite, Select, Show, Summarize, Transform, Translate
- **Evaluating:** Advise, Appraise, Argue, Arrange, Assess, Choose, Collect, Combine, Compile, Compare, Confront, Construct, Create, Design, Develop, Device, Discuss, Elaborate, Enforce, Estimate, Forecast, Formulate, Generate, Hypothesize, Imagine, Improve, Integrate, Invent, Invest, Make up, Manage, Maximize, Minimize, Modify, Monitor, Organize, Originate, Perform, Plan, Predict, Prepare, Produce, Propose, Review, Revise, Set up, Solve, Suppose, Test, Theory, Verify, Write
- **Creating:** Adapt, Arrange, Assemble, Build, Change, Choose, Collect, Combine, Compile, Compile, Construct, Create, Design, Develop, Device, Discuss, Elaborate, Enforce, Estimate, Forecast, Formulate, Generate, Hypothesize, Imagine, Improve, Integrate, Invent, Invest, Make up, Manage, Maximize, Minimize, Modify, Monitor, Organize, Originate, Perform, Plan, Predict, Prepare, Produce, Propose, Review, Revise, Set up, Solve, Suppose, Test, Theory, Verify, Write

Deming’s Profound Knowledge

Training, Skill Acquisition, Practice to Play Ratio high

Traditional "Education" Learning (typically ‘owned’ by the ‘teachers’)

https://lynniesephd.wordpress.com
Assess against the BOK/S using a well anchored, tailored Blooms Taxonomy scale

Certifications are ‘easier’ to do QA on.....
Agile has done what ILSS and Lean have done—lots of certifications and providers
And, as with ILSS, Agile has a Certification ‘System’ that is crowded with competitors and confusing in terms of QA so TPG needs to be careful as we have been in the ILSS space.
Doing your homework is important, same for BPI (ILSS)

<table>
<thead>
<tr>
<th>Comparison: Selected Agile Certifications</th>
</tr>
</thead>
</table>
| **PMI Agile Certified Practitioner**  
(PMI-ACP) | **Certified Scrum Master**  
(CSM) | **Professional Scrum Master I**  
(PSM I) |
| **Issued by** | PMI | Scrum Alliance | Scrum.org |
| **Prerequisites** | 2000 hours project experience  
1500 hours agile experience  
21 hours agile training | Completion of 2-day course by  
authorized trainer no more than 90  
days prior to assessment | None (understanding of Scrum  
Guide necessary to pass, trial  
exam “Scrum Open” available at  
scrum.org) |
| **Form of assessment** | In-person in assessment center, 120  
multiple choice questions, 3 hours | Online, 35 multiple choice  
questions, 1 hour | Online, 80 multiple choice  
questions (1 or more correct  
answers to each), 1 hour |
| **Passing Score** | Undisclosed (est. around 70%) | 68.6% | 85% |
| **Price** | $ 435 (PMI members) | Test only available through course;  
included in course fee | $ 150 |
| **Renewal** | 3 year credential maintenance cycle  
(30 PDUs in agile PM to renew) | 2 year cycle, re-certification online  
for $100 | Not required |
| **Purpose** | Standardization of “agile” across  
many agile methodologies | Clarification and promotion of  
Scrum | Clarification and promotion of  
Scrum |
| **Target audience** | People willing to demonstrate their  
experience with and understanding  
of Agile practices | People willing to take a first step  
towards Scrum mastery | People willing to take a first  
step towards Scrum mastery |
A few providers stand out in the crowd (at first glance)
I’m impressed with the focus on Business Agility...
Bottom line is that we need to ensure we do with AGILE what we did with Integrated LeanSigma and ensure our training and certifications are best in class.
Accurately assessing level of competency, proficiency for even fundamental ISE skills can be challenging.
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And don’t forget IISE’s new Operational Analytics Certification Program...
Let’s zoom in on a 101/201 overview of Agile

1. **Strategy Alignment and Leadership Continuity**—Shared Vision Creation Process issues

2. **Alignment to Migration Strategies and Plans**—PMO and BPI capabilities lacking

3. **Change Leadership & Management Skills and Execution Discipline**

4. **Learning Organization issues, Competency Improvement System ad hoc**

5. **Not Mastering Integrated Master Planning, OKR, Agile, Huddles as an integral part of the Implementation and Deployment Process**
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  https://us06web.zoom.us/webinar/register/WN_42UBHzqtSdyvxE-4MoHxQ

• 2 Aug—Designing and Building Successful Tiered Huddle Systems

• 16 Aug—Tackling Competency Improvement—Perspectives and Points of View

• 13 September—Final Four ISE Capstone Senior Design Project Case Studies

And don’t forget IISE’s new Operational Analytics Certification Program...
Huddle Basics and Components (Aug)

• What is a Huddle?
• The Huddle Board itself and Visual Management
• The Huddle Process Purpose and Objectives
• The Huddle Process, Structure and Strategy Deployment and Execution and Continuous Study-Adjust
• Roles, Responsibilities and Accountabilities
• Agenda’s and Agenda Management
• Huddle Facilitation and Leadership
• Energy Management with Huddles, over time
• Related Techniques and Methods
  • 2-Second Lean
  • Gemba Walks
  • Kaizen Events
Scrum is a framework that helps teams work together. Much like a rugby team (where it gets its name) training for the big game, scrum encourages teams to learn through experiences, self-organize while working on a problem, and reflect on their wins and losses to continuously improve.

While the scrum I’m talking about is most frequently used by software development teams, its principles and lessons can be applied to all kinds of teamwork. This is one of the reasons scrum is so popular. Often thought of as an agile project management framework, scrum describes a set of meetings, tools, and roles that work in concert to help teams structure and manage their work.
• Every organization will be unique in terms of Tiers, the best, most effective and efficient way to set up the infrastructure for Huddles.

• The real purpose of Huddles is to ensure information flows top-bottom and horizontally, cross functionally are sufficient to accommodate the dynamics the organization faces.
Huddles 101

Huddles are intended to be very tight, short, focused, productive.

They augment, enhance other PDSA System meetings that occur.

They really

Huddles are an integral component of an organizations work to ensure effective communication and coordination top-down and across an organization. They are most often either daily or weekly.
In General, this image depicts the structure of Tiered Huddles.

Establishing the frequency and a cadence around the Huddles will be important.

Also, managing information sharing up and down and across the business will be important to success.

The plan is to have Peter Hunter Set up/initialize, train, support, coordinate the Huddle ‘system’ (e.g. PMO objective and accountability).
Need to Manage People and Teams Differently: Reviews & Retrospectives fuel Double and Triple loop learning

They reflect thoughts, words, deeds that build Learning Organizations…..

**TRIPLE LOOP LEARNING**
- How do we decide what is right?
- Here’s why we want to be doing this—principles

**DOUBLE LOOP LEARNING**
- Are we doing the right things?
- Here’s why this works: insights and patterns

**SINGLE LOOP LEARNING**
- Are we doing things right?
- Here’s what to do: procedures or rules.

**COMPLEX**

**COMPLICATED**

**SIMPLE**
Operational Excellence, Performance Excellence, Integrated LeanSigma, Operational Analytics, BPM/I 4.0, High Performing Cultures, Integration of Strategy-People-Process-Information and Technology Enablement, Best in Class Case Studies, Networking

All being Developed for you for New Orleans in May 2023!!!
Customer and Member Satisfaction and Feedback Survey

Agile & Business Process Management 4.0: Perspectives & Points of View

You can go to this IISE link soon and get deck and recording. https://www.iise.org/details.aspx?id=46729

Certificates of Participation will be e-mailed to you within 3 business days.
Just Ahead.....

2022 Webinar Topics under Development

• 14 July—PACCAR’s Op Ex, LeanSigma, Continuous Improvement Journey
  https://us06web.zoom.us/webinar/register/WN_42UBHzgtSdyvxE-4MoHXxQ

• 2 Aug—Designing and Building Successful Tiered Huddle Systems

• 16 Aug—Tackling Competency Improvement—Perspectives and Points of View

• 13 September—Final Four ISE Capstone Senior Design Project Case Studies

And don’t forget IISE’s new Operational Analytics Certification Program...
Most organizations are engaging employees at all levels in Process/Performance Improvement activities on top of their ‘day jobs’

**FROM**

Suboptimal Time Mgmt

- A = Administer (DO) our day jobs, accomplish our accountabilities
- C = Cater to Crises, Fight Fires, do the unexpected
- D = Do the Dumb, waste time, non-value add time and effort (right things, wrong way; wrong things, right way; wrong things, wrong way)
- E = Enjoy Life
- B = Build the Business (improve what we do and how we do things)

**TO**

Optimal Time Mgmt

Employee Engagement in Huddles and Continuous Improvement and other “B” type of initiatives can cause this shift in how we spend our time

The Default Position for Most Organizations looks something like this (in general)—too much NVA, too many crises to cater too, not enough quality A time, and not enough quality B
The Huddle Board itself

Huddle boards come in many forms and the content and portrayal of data/facts/information on the huddle board can and does vary depending on the nature of the group. There is no one best layout, format.

We will be designing Huddle Boards for Supply Chain (done), the Bird Seed Demonstration Pilot, DC’s, Stores, and a few units (e.g. Merchandising) in addition to the Tier 1 Huddle.

In general there Huddle Boards have the following ‘sections’:

• Key Process Metrics for the Unit (time series data portrayal) organized by Key Result Areas critical for the unit;
• Key Objectives that are in-flight (progress and performance);
• Some sort of ‘start, stop, continue’ ideation, or study-adjust space;
• In Ops Units, information on what’s planned for day, resources available, key issues, etc.
• Other information as required and appropriate.
Huddle Basics and Components

- Where Huddles fit in the Peavey Performance Management Process/System
- What is a Huddle?
- The **Huddle Board** itself and **Visual Management**
- The **Huddle Process Purpose** and **Objectives**
- The Huddle Process, Structure and Strategy Deployment and **Execution** and **Continuous Study-Adjust**
- Roles, Responsibilities and Accountabilities
- Agenda’s and Agenda Management
- Huddle Facilitation and Leadership
- Energy Management with Huddles, over time

**Related Techniques and Methods**
- 2-Second Lean
- Gemba Walks
- Kaizen Events
The intent is to have our Virtual Huddles integrate tightly with our Sharepoint Scorecard Hub pages and then link to the ‘whiteboards’ (Miro at this point) for the study-adjust conversations.
Agile Reviews, Retrospectives, and Huddles

- Sprint Review
  - Sprint Backlog, i.e.:
    - Sprint Goal
    - Product Backlog items selected
    - Sprint plan
- Daily Scrum
  - 15 minute event
  - Progress toward the Sprint Goal
  - Actionable plan for the next day
- Sprint Retrospective
  - Plan ways to increase quality and effectiveness
- Sprint Review
  - Inspect the outcome
  - Plan next activities - adjust Product Backlog

AGILE RETROSPECTIVE
The 5 Stages of a LEAN Sprint

1. Expose problems
2. Define solutions
3. Shortlist solutions
4. Test solutions
5. Decide on solutions

Sprint Retrospective
Meeting after Sprint Review to review processes

- What went well?
- What could be improved?
- How can we improve it?

30 min - 3h
Self-analysis on how to work
Problem analysis and improved aspects
Framework improvements

Product owner + Scrum team
Sample Questions for ‘Retrospectives’

https://easyretro.io/blog/23-questions-to-ask-during-a-sprint-retrospective/

Examples from ‘literature’ (IoT)

• What helps you to be successful as a team?
• How did you do this sprint?
• Where and when did it go wrong in this sprint?
• What do you expect, from who?
• Which tools or techniques proved to be useful? ...
• What is your biggest impediment?
• If you could change 1 thing, what would it be?
• Can you reiterate the most important thing you learned today?
• How are you feeling about our next sprint now that we've identified these issues?
• Is anyone confused or unclear on any of the items we discussed today?
• Do all of our next steps make sense?

Fundamental Questions for today’s Retrospective

https://www.infoq.com/articles/4-questions-retrospective/

• What Worked? (Appreciative Inquiry)
• What Needs Work?
• What have we Learned?
• What are we curious about, what still puzzles us, what do we want/need to know to succeed going forward?
• What’s the next Sprint (Purpose, DONE/Success, Strategy for Success, Requirements for Success) need to look like?
Review & Retrospective 8 July 2022

Progress & Performance Overview and other Key Questions

• What are the Significant Accomplishments this week that will/are directly impact(ing) Sales? Tangible deliverables?

• What did we get done this week that will ensure that proposal quality is not an issue? Tangible improvements?

• What did we get done this week that will enable us to do a better job with Study-Adjust starting next week? Tangible new components, dials?

• What did we get done this week that will ensure we launch our new projects well and preserve profitability? Tangible preparation for week of 18th?

Retrospective

• What did we learn about from our B-work this week, or our A-work, that we will apply, put to use next week?

• What are the Tangible Objectives and Associated Key Results Intended for Next week in OKR 1 and 3?

• What are the Planned Significant Accomplishments for next week for critical Enablers to support Sales and Project Delivery Quality and Profitability?
**The Evolution of Software Development: An Agile Toolkit**

1950s-70s
- **The Machine That Changed the World** published describing Toyota Production System as Lean Manufacturing

1960s
- Disney production meetings
- No more 'chickens and pigs'
- Fewer meetings

1990
- **'The Lean Startup'** co-founder

1993
- Scrum
- Lean iteration/evaluation meetings

1996
- **Lean Thinking** published
- Leaning out lean methodology as business and organizational model

2001
- **Challenging the Fundamental Notions of Software Development** published

2003
- **12 Principles of Lean Software Development**

2011
- **The Lean Startup**
- A guide for combining lean software development with a lean business model specifically for startups
What is a Business Process (Wiki)

- A **business process**, **business method** or **business function** is a collection of related, structured activities or **tasks** by people or equipment in which a specific sequence produces a service or product (serves a particular business goal) for a particular customer or customers. Business processes occur at all organizational levels and may or may not be visible to the customers.[1][2][3] A business process may often be visualized (modeled) as a **flowchart** of a sequence of activities with interleaving decision points or as a process matrix of a sequence of activities with relevance rules based on data in the process.[2][3][4][5] The benefits of using business processes include improved customer satisfaction and improved agility for reacting to rapid market change.[1][2] Process-oriented organizations break down the barriers of structural departments and try to avoid **functional silos**.[6]
Perhaps the highest level would be an End2End Value Stream Map for the Enterprise.
The Business Process Groups from the Enterprise Value Map:

- Business Strategy and Management
- Customer Strategy, Relationship & Interactions
- Product Strategy, Development and Make/Buy
- Human Resource Strategy and Management
- IT Strategy and Management
- Other Shared Support Enterprise services
This is why people do Business Process Management

- Reduced Risks
- Enhanced Process Consistency
- Greater Brand Protection
- Product Safety
- Health and Safety
- Improved Predictability
Typical ERP BPM “Modules”

- **Sales**: Implements functions of order placement, order scheduling, shipping and invoicing.
- **Procurement (SRM)**: Maximise cost savings with support for the end-to-end procurement and logistics processes.
- **Production (PLM)**: Helps in planning and optimising the manufacturing capacity and material resources. It is evolved from the MRP.
- **Distribution (SCM)**: Control warehouse processes and manage movements in the warehouse and respond faster to challenges and changes in supply and demand.
- **Enterprise asset management**: Efficiently and sustainably manage the entire asset lifecycle, improve asset usage and cut costs with powerful analytics.
- **Business Intelligence**: Analyse data and convert to information.
- **e-Commerce**: Focus on external strategies and others...
- **Corporate performance and governance**: Aims to streamline and gain greater control of the corporate services.
- **Customer services (CRM)**: Capture and maintain customer relationships, facilitate the use of customer experiences and evaluate the knowledge management.
- **Human Resource**: Maintain a complete employee database and to optimally utilise of all employees.
- **Accounting**: Automate any financial operations while ensuring regulatory compliance and gaining real-time insight into overall performance.

**ERP II modules**
Business Process Management 4.0: Fundamental Questions

- What do you mean when you say Business Process Management?

- What is this 4.0 concept?

- What’s the Vision or End Game for BPM 4.0, Eduardo you call it Business Excellence?

- How would one create a practical migration strategy and plan to address capability and performance gaps?

- How can IISE and ISE help with this significant piece of work?
Where the Industry is **Going (Already)**

**Automated ecosystems of “event-driven process mining”, triggering workflow and leveraging AI & RPA is here**

The day of static, business process maps are going extinct in organizations

**VISUALIZATION OF THE ACTUAL PROCESSES**

**AI-POWERED ROOT CAUSE ANALYSIS & IMPROVEMENT**

**EVENT LOG**

- 2016-12-01 CREATE PURCHASE ORDER #1234
- 2016-06-23 START PRODUCTION #5678
Where the Industry is **Going (Already)**

76% of banks w/ assets >$100B have implemented AI based strategies

These are organization wide ecosystems, NOT point solutions

**KEY CAPABILITIES**

- Get started within a few clicks with **pre-built connectors** and Out-Of-The-Box analysis templates for the most common use cases
- Gain business insights immediately with **instant data extraction**
- Use **dynamic visualizations** of Your client’s process with powerful meta data drill down functionalities to quickly generate valuable insights
Typical BPM journey from inception
Where the Industry is Going (Already)

EXTERNAL AUDIT USE CASE

GENERAL
✓ All cases covered without sampling
✓ Easy detection of End-to-End process
✓ One-time scan and extraction of data
✓ Objective information for 100% fact based discussions
✓ Show all financial flows within the regarding business

SPECIFIC
✓ Drill down to specific process steps
✓ Pre-defined analysis helps to increase audit efficiency
✓ In-depth work with endless options to filter
✓ Use your own digital solutions

BENEFITS
Value-Add of Process Mining
50% increase of win rate with Celonis Conformance Check
Average time of data extraction
1 day

What can it look like?
Business Process Management 4.0 and 5.0

Leveraging a variant of CMMI taxonomy, we can assess the maturity of an organization's BPM competency among specific attributes. There is a high correlation between mature organizations and business longevity. TPG sees an average maturity index of 2.4 / 6 across its past ~300 projects.

1. Ad Hoc, Habit
   - Controlled chaos. Things get done; we don’t really know how. Process is art. Process isn’t documented.

2. Defined, understood
   - Processes are written down. People thought through current state. Some is outdated and processes are broken. A few digital workflows may exist but is sparse.

   - Future-state has been designed and somewhat implemented. Processes are fairly fresh, and we are fixing many as an organizational competency. Many workflows are virtual, some are automated.

4. BPI--Managed
   - A mature competency exists to both document new processes and fix broken processes dynamically. Processes are documented, many virtually with dynamic workflows and the system is governed by people and technology.

5. Reengineered, increasing automation
   - Most process is digital, via a “digital twin”. Process mining exists and process data is constantly analyzed. All or most of those processes that can be automated, are, leveraging RPA, AI and other advanced tools. Governance is rigorous, tight and controlled.

6. Autonomous
   - Algorithmic-based programs analyze dynamic process data that has been mined and automatically both predict and mitigate process breakdowns autonomously (Autonomous Business Process – ABP). Human intervention is only required if the business rules call for it, or if a decision is needed a human can make better than a machine.
Business Process Management 4.0: Fundamental Questions

• What do you mean when you say Business Process Management?

• What is this 4.0 concept?

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• How would one create a practical migration strategy and plan to address capability and performance gaps?

• How can IIESE and ISE help with this significant piece of work?
Global Business Excellence

Lean Six Sigma Deployment
Agile Continuous Improvement
Enables a **repeatable and reliable business system**

Key enabler to robustly drive **consistent and discipline improvements** with people engagement
Global Business Excellence Objectives

**People & Culture**

People is the most valuable asset in the company, which valuates day-by-day
- People empowerment, engagement, development & recognition
- DNA culture of Continuous Improvement that is always seeking a better way, moves fast and does the right thing
- It’s ALL about People

**Business Enabler**

Drive Agile Continuous Improvement aligned to Flex Forward strategy to make Lean Six Sigma a Way of Life
- People training and deployment
- Kaizen to Business Needs (KTBN) Workshops, Small Group Activities (SGA), Six Sigma Workshops, DFFS, Webinars & Best Practices sharing
- Lean & Six Sigma Certification

**Effectiveness**

Enable Customer Value Stream teams to...
- Enhance Customer experience and a valuable partner to improve the world
- Drive excellence in Design, Operations, Supply Chain & Office functions
- Contribute savings to bottom line

**Increase Competitiveness**

Increase Competitiveness

**Agile Continuous Improvement**

Performance Tracking Tool For Sustainable Deployment

- Drive Agile Continuous Improvement
- Enable Customer Value Stream teams to...
- Increase Competitiveness
- Agile Continuous Improvement
- Performance Tracking Tool For Sustainable Deployment
Continuous Improvement Methodology

**Flex Lean Enterprise**

**Six Sigma Capabilities**

Deploy Systematic Process Improvement Using DMAIC / DFSS Methodology

**Deployment Approach**

Establish Model Lines

- Line 1
- Results
- Line 2
- Results
- Line 2
- Results

**Measurement & Sustenance**

- JIDOKA
- SMED: Changeover
- Abnormalities
- Automation
- Kanban
- Six Sigma

** Kaizen Goals:**

- Double the Good and
- Halve the Bad with
- Triple the Speed and Sustain!

- Productivity Improvement $\times 2$
- Inventory Reduction $\times \frac{1}{2}$
- Lead Time Reduction $\times \frac{1}{2}$
- Scrap Elimination $\times \frac{1}{10^{th}}$
- Defects Elimination $\times \frac{1}{10^{th}}$

**DFSS Design for Six Sigma**

Eliminating Variation and Improve Quality

**Deploy a Continuous Improvement Culture**

High impact projects & prescriptive benchmarking linked to customer and business needs

Lean + Six Sigma = Speed + Accuracy
Flex Lean Six Sigma Journey

Establish an Agile Continuous Improvement Management System that enables Flex Forward and ensures Flex is a valuable partner to improve the world.

Lean Operations
Lean Supply Chain
Lean Office
Lean Six Sigma 4.0
Just -in-Time (JIT)
Setting Foundation
Heijunka
Jidoka
Agile CI

Lean 2.0
Lean 2.0
Lean 2.0
Lean Supply Chain
Lean Supply Chain
Lean Supply Chain
Lean Office
Lean Office
Lean Office

Commit to Deliver

Degree of Change + Impact

Time

• Training
• Leadership
• Change Management
• Supermarket
• TAKT Time
• Single Piece Flow
• Value Stream Map
• 5S + 1
• Quality
• Cost
• Delivery
• Responsiveness
• Productivity
• Visible Difference
• Efficiency
• Speed
• Assets Velocity
• People Empowerment
• Lead Time Reduction
• Pristine Ramp, Transfer & Startups

Agile Continuous Improvement

Lean Six Sigma 4.0

• Digitization
• Automation

Kaizen to Business Needs

Aligned to Finance & Business Priorities

• End-to-end business process
• Customer / Supplier Engagement

Lean 2.0

• End-to-end supply chain processes

Lean Office

• Streamline office processes

Lean Supply Chain

• Level Loading
• Sequencing

Lean Office

• Poka Yoke
• Stop @ Abnormalities

Lean Supply Chain

• Pull Production

Lean Office

• Just -in-Time (JIT)

Lean Supply Chain

• TAKT Time
• Single Piece Flow
• Pull Production

Lean Office

• Value Stream Map
• 5S + 1

Lean Supply Chain

• Quick Changeover

Lean Office

• Environment (CSER)
• Loss Prevention
• System Migration

Just -in-Time (JIT)

• Training
• Leadership
• Change Management
• Supermarket
• TAKT Time
• Single Piece Flow
• Value Stream Map
• 5S + 1
• Quality
• Cost
• Delivery
• Responsiveness
• Productivity
• Visible Difference
• Efficiency
• Speed
• Assets Velocity
• People Empowerment
• Lead Time Reduction
• Pristine Ramp, Transfer & Startups

KTBN with Finance

Commit to Deliver

Flex Lean Six Sigma Journey
Business Process Management 4.0: Fundamental Questions

• What do you mean when you say Business Process Management?

• What is this 4.0 concept?

• What’s the Vision or End Game for BPM 4.0, Eduardo you call it Business Excellence?

• How would one create a practical migration strategy and plan to address capability and performance gaps? (Dialogue facilitated by Scott)

• How can IISE and ISE help with this significant piece of work?
Q&A with Jared and Eduardo

- Eduardo, you and I were discussing the World Economic Forum and the Lighthouse Network, can you tell us briefly about this in context of BPM 4.0?

- Jared, in our last webinar in this BPM 4.0 series from IISE you walked us through strategies and tools to migrate up the BPM Maturity Levels, any high level thoughts on the migration strategy development a firm might use to get going with this a little more systematically?

- Eduardo, you own, are responsible for a lot, have a lot on your plate. How do you juggle all the balls that are involved in Enterprise Transformation and Operational Excellence?

- What’s your vision for the next 5 years in this domain?
Examples of trends in Industry 4.0

- **Future of Manufacturing | Global Lighthouse Network – YouTube**

  https://www.weforum.org/events/the-davos-agenda-2022


  https://www.weforum.org/agenda/2022/01/8-innovations-advanced-manufacturing-support-esg-reporting/
The Global Lighthouse Network includes 90 sites as of September 27, 2021.

Since publication of Reimagining operations for growth in March 2021, the network’s expert panel has added 21 new lighthouses and 3 designated sustainability lighthouses. The network consists of 90 lighthouses identified across different industry sectors and includes the newest designation of sustainability lighthouse. In this white paper the latest achievements of the network are explored, with a focus on sustainability.

- **Ericsson**
  Lewisville, Texas, US

- **Schneider Electric**
  Lexington, Kentucky, US

- **Henkel**
  Düsseldorf, Germany

- **1 Henkel**
  Toluca, Mexico

- **2 Protolabs**
  Plymouth, Minnesota, US

- **3 Johnson & Johnson DePuy Synthes**
  Bridgewater, New Jersey, US

- **4 Johnson & Johnson Vision Care**
  London, UK

- **5 De’Longhi Group**
  Treviso, Italy

- **6 Flex**
  Althofen, Austria

- **7 Arçelik**
  Esrincehir, Turkey

- **8 Saudi Aramco Abqaiq, Saudi Arabia**

- **9 Western Digital**
  Prachinburi, Thailand

- **10 Western Digital**
  Penang, Malaysia

- **11 Innolux**
  Kaohsiung, Taiwan, China

- **12 CITIC Dicastal**
  Qinhuangdao, China

- **13 SANY**
  Beijing, China

- **14 AUO**
  Taichung, Taiwan, China

- **15 Foxconn**
  Wuhan, China

- **16 CATL**
  Ningshe, China

- **17 Foxconn**
  Zhengzhou, China

- **18 Haier**
  Tianjin, China

- **19 LS ELECTRIC**
  Cheongju, South Korea

- **20 Schneider Electric**
  Wuxi, China

- **21 Unilever**
  Taicang, China

Note: For details of previously selected lighthouses, see Reimagining Operations for Growth, World Economic Forum, March 2021.
<table>
<thead>
<tr>
<th>What has changed in the world?</th>
<th>What are the shifts stemming from these challenges?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand uncertainty and disruptions are challenging planning systems</td>
<td>Agility and customer centricity</td>
</tr>
<tr>
<td>National security interests, trade barriers and logistics disruption will demand alternatives to globalized supply chains</td>
<td>Supply chain resilience</td>
</tr>
<tr>
<td>Disruption of global manufacturing and supply chains are challenging manufacturers</td>
<td></td>
</tr>
<tr>
<td>Forced transition to remote management and digital collaboration</td>
<td></td>
</tr>
<tr>
<td>Physical distancing regulations for safe return to work are forcing manufactures to reconfigure their manufacturing flows</td>
<td>Speed and productivity</td>
</tr>
<tr>
<td>Displacement of large parts of the workforce, unbalanced decline and growth between sectors</td>
<td></td>
</tr>
<tr>
<td>Economic recession necessitates rapid operational and capital cost reduction</td>
<td></td>
</tr>
<tr>
<td>Increased global concern for environmental impact of human activities</td>
<td>Eco-efficiency</td>
</tr>
</tbody>
</table>
https://www.weforum.org/agenda/2022/01/8-innovations-advanced-manufacturing-support-esg-reporting/
<table>
<thead>
<tr>
<th>KPIs improvements</th>
<th>Impact range observed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productivity</strong></td>
<td></td>
</tr>
<tr>
<td>Factory output increase</td>
<td>![Progress Bars] 4-200%</td>
</tr>
<tr>
<td>Productivity increase</td>
<td>![Progress Bars] 5-160%</td>
</tr>
<tr>
<td>OEE increase</td>
<td>![Progress Bars] 3-90%</td>
</tr>
<tr>
<td>Product cost reduction</td>
<td>![Progress Bars] 5-40%</td>
</tr>
<tr>
<td>Operating cost reduction</td>
<td>![Progress Bars] 2-45%</td>
</tr>
<tr>
<td>Quality cost reduction</td>
<td>![Progress Bars] 5-90%</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td></td>
</tr>
<tr>
<td>Waste reduction</td>
<td>![Progress Bars] 2-90%</td>
</tr>
<tr>
<td>Water consumption reduction</td>
<td>![Progress Bars] 10-30%</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>![Progress Bars] 1-50%</td>
</tr>
<tr>
<td><strong>Agility</strong></td>
<td></td>
</tr>
<tr>
<td>Inventory reduction</td>
<td>![Progress Bars] 10-90%</td>
</tr>
<tr>
<td>Lead time reduction</td>
<td>![Progress Bars] 7-90%</td>
</tr>
<tr>
<td>Changeover shortening</td>
<td>![Progress Bars] 30-70%</td>
</tr>
<tr>
<td><strong>Speed to market</strong></td>
<td></td>
</tr>
<tr>
<td>Speed-to-market reduction</td>
<td>![Progress Bars] 30-90%</td>
</tr>
<tr>
<td>Design iteration time reduction</td>
<td>![Progress Bars] 15-66%</td>
</tr>
<tr>
<td><strong>Customization</strong></td>
<td></td>
</tr>
<tr>
<td>Configuration accuracy increase</td>
<td>![Progress Bars] 15-20%</td>
</tr>
<tr>
<td>Lot size reduction</td>
<td>![Progress Bars] 55-98%</td>
</tr>
</tbody>
</table>

*Global Lighthouse Network: Four Durable Shifts for a Great Reset in Manufacturing*
Industrial Engineers can’t escape the inevitability of organizations wanting to climb the ladder of BPM maturity, thus new skills and familiarities with certain technology platforms are warranted. Many of which are not taught formally in academia.

Recommended path given current climate. BUT ideal would be to have broader knowledge across a variety of platforms vs. singular knowledge of one.
Navigating Maturity Level 1 and the 1-2 Transition

Many IE's, especially those deployed into small organizations, startups or organizations with lower maturity, may find themselves working on the basics, to setup the foundation for higher levels.

**Frameworks to Employ**

- **Enterprise Levels 1-3 Mapping**
- **Swimlane Level 4 Mapping**
- **RACI Matrix**
- **SOP’s**

**Tools to Support**

- Visio
- Excel
- Word
- Access

**Strategies**

- Get an understanding of the enterprise business processes
- Choose, in priority order, business processes to get mapped (Visio is most common) and map by swim lane
- For the most critical processes, get clear SOPs in place and trained on
- Basic RACI matrix to see the interactions between and within processes
- Basic database management to extract some manual process data
Navigating Maturity Level 2/3 and the 2/3 - 4 Transition

It’s likely that this will be the most common place you find yourself in as an IE supporting an organization. Process exists, but the continuous framework to continuously monitor and adjust is immature. Some workflow is digitized, but rarely automated and process data is still sparse.

**Frameworks to Employ**

- Clear R&R Around Who “Owns” Process
- Multi-Tiered Governance PMO/BPI Model
- Process Digitization, Workflow
- Process Data Mining, Basic Analysis

**Strategies**

- Typically, sustainability is an issue migrating to “managed” – processes don’t stay fresh. Figuring out who owns business process may seem trivial, BUT we need to strive to drive ownership
- Establish governance and ownership, how/if PMO or corporate BPI exists, if it’s the departmental owners, etc.
- Begin exposing some of the workflows virtually/digitally in workflows leveraging appropriate tools
- Begin dealing with process data, mined manually to assess the efficacy and basic stats on assessing and building future state
Navigating Maturity Level 4 and the 4 - 5 Transition

This phase begins to stretch the typical IE background and does require access to some more advanced tools and analytics to properly employ. However, this phase can also deliver much higher ROI's via automation.

**Frameworks to Employ**
- Digital Twin
- Automation Workflow

**Strategies**
- Create the “digital twin” of in-scope business processes, those ripe for automation via technology platforms matched to your organization's tech stack / ERP
- Begin using tools to leverage RPA to automate some of the digital workflows you have. Some great candidates are typically found in the service back office around invoice management
- Work with more dynamic process data, mining both manually and semi-automatically and setup business rules for cases where decision support comes automatically without much human intervention
- Ensure integration of governance structure upon review of automated or semi-automated processes

**Tools to Support**
- UiPath
- airSlate
- blueprism
- Automation Anywhere

**Process Layers to Mined Data**
- 4—Systematic BPI
- 5—Reengineered, Automation
Navigating Maturity Level 5 and the 5 - 6 Transition

There are very few organizations that are fully level 6 on BPM maturity. Those that have parts of their business at level 6 tend to be in financial services/banking, and tend to be highly transactional, with significant access to data, including process data.

**Frameworks to Employ**

- **AI, ML and other Algorithms**
- **Auto Neural Networks & Node Creation**
- **Larger Scale, In-Memory and Dynamic Database Design**

**Tools to Support**

- Celonis
- RSM
- Amazon SageMaker
- IBM
- BiC Process Design

**Strategies**

- Ensure a framework where process data is digital, mined and stored dynamically
- Ensure digital twin is replicated of process
- Instead of static business rules around the process, consider leveraging an LSTM algorithm based on a large data set of time-series data
- Begin setting up test environments and leverage historical data and current data to test predictions
- Ensure business rules are in place to detect out of control signals and warning signs before full autonomous control is given
- Leverage relationships with vendors and other technology companies (consider Watson & Sagemaker use-cases)
Business Process Management 4.0: Fundamental Questions

• What do you mean when you say Business Process Management?

• What is this 4.0 concept?

• What's the Vision or End Game for BPM 4.0, Eduardo you call it Business Excellence?

• How would one create a practical migration strategy and plan to address capability and performance gaps?

• How can IISE and ISE help with this significant piece of work?
2022 Webinar Topics under Development

• 14 July—PACCAR’s Op Ex, LeanSigma, Continuous Improvement Journey
  https://us06web.zoom.us/webinar/register/WN_42UBHzgtSdyvxE-4MoHXxQ

• 2 Aug—Designing and Building Successful Tiered Huddle Systems

• 16 Aug—Tackling Competency Improvement—Perspectives and Points of View

• 13 September—Final Four ISE Capstone Senior Design Project Case Studies

And don’t forget IISE’s new Operational Analytics Certification Program...
Thank You!

Council on Industrial & Systems Engineering

Contact us for More Info:

For *more information* on how IISE can play a role with your Professional Development needs:

**James Swisher:**  jswisher@iise.org

For *questions* about our IISE Webinar Series and our IISE Operational Analytics Certification Program:

**Scott Sink:**  ssink@jumpcurves.com

Special Thanks to our Sponsors for this Webinar:

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For *more information* on how the Poirier Group can play a role with your Operational Excellence and organizational transformations please contact:

**Jared Frederici:**  jared.frederici@thepoiriergroup.com

https://www.linkedin.com/in/jaredfrederici/
An Operational Analytics Certification will significantly enhance your foundational training

Overview

Organizations are swimming in data, colloquially they are data rich and information poor.

Migrating from Data to Information to Insights and Understanding to Decisions/Actions and ultimately to Business Benefits Realization is the end game.

Organizations are losing at this game today because they don’t have the right knowledge and skill sets to execute the right strategies to harness the power coming from More Data and the ability to move it faster.

Professionals, perhaps most importantly, students in ISE, that become proficient at Operational Analytics will have unprecedented career opportunities.

This program is focused on building your knowledge and skills in a tiered fashion—Understanding to Principles, Methods, Tools to Application Skill Development as the foundation. This comes from this initial blended training program.

Sitting on top of that base, we’ll support your migration to higher levels of Mastery (Analysis, Solution Creation, System Design and Development, Deployment) with the Certification portion of this program.

Investment Requirement

Certificate:
~ 3-6 mos. Elapsed time
~ 220 hours (e.g. equivalent to 1, 3 credit hour U/G level class
$450 for ISE Students (must be members of IISE)
$575 for Professional IISE members, $725 for professional, non IISE members

Certification:
$250 for Student IISE members
$950 for Professional IISE Members, $1250 for Professional Non-Members of IISE
We had several target audiences in mind when we designed and developed this course:

1. Industrial and Systems Engineering Undergrads (Seniors) and Grads who want to augment their BSISE degrees;

2. Young Professionals who want to expand Career possibilities, strengthen Resumes, Linkedin Profiles and have a strong appetite for Analytics;

3. Business Intelligence Professionals who sense that there is more to Analytics than just creating lots of Power BI Reports and realize the real Leaders and Managers are overwhelmed with Data and frustrated that they can’t get IT to support them, as customers, better.
Course Modules and Learning Objectives

We have 10 Core Modules in the Course:

1. Course Overview and Guidance
2. Operational Analytics Perspectives and Points of View from Thought Leaders
3. Operational Analytics: The Data Management Role
4. Operational Analytics: The Analyst Role
5. Operational Analytics: The Data Scientist Role
6. Operational Analytics: Business Process Improvement and Integrated LeanSigma Role
7. Visible Measurement Systems, how to deploy to support Study-Adjust
8. Operational Analytics: The Management Systems Engineer Role
9. Operational Analytics: Case Studies
10. Operational Analytics Final Exam

Learning Objectives

• Understand the Fundamentals of Operational Analytics through the Voice of Thought Leaders in this field
• Understand and Practice with the Data Management Role—how to get data, store it, organize it, cleanse it, integrate it....
• Understand and Practice with the Data Analyst Role—how to understand the voice of the ‘customer’, how to understand the fundamental questions that need answered, how to convert data to usable information
• Understand Data Sciences—advanced data capture, data management, data analytics by building intelligence and learning into our ‘machines’
• Understand and Practice with the application of Op Analytics to Business Process Improvement and Integrated LeanSigma
• Understand and practice how to bring all this together in the form of Engineered Management Systems and to integrate in Visible Measurement Systems and effective Study-Adjust processes.
Program Highlights

Recently pre-recorded webinar recordings in 60 minute digestible chunks provided by thought leaders and faculty in our program. On-Demand.

Best-in-class Case Studies

- Op Analytics embedded in Process Improvement Projects (6 practical, industry diverse tollgate decks to help you internalize how this works)
- Data Sets from real world projects to aid you in developing reduce to practice skills

The LearnUpon LMS is intuitive and easy to use and has a way for us to Track your Practice work and interact as appropriate.

Virtual Coaching Sessions by Module provided by Faculty
Community Q&A/Chat Boards.
Live, synchronous training sessions monthly.
Competency Development Model

- **Foundational Principles, Methods, Tools (Certificate)**
  - Take the course, pass the exam

- **Reduction to Practice Skills (Certification)**
  - Successfully Complete an OA Project (prove you can reduce to practice)

- **Advanced Mastery Level (Advanced Certification)**
  - Complete the Mastery Level Program (In Development)
    - Proof of breadth and depth
Special Offer to Webinar Participants today…

https://www.iise.org/TrainingCenter/CourseDetail/?EventCode=OAO

The 10% off Coupon Code is OpAnalytics10