IISE’s Operational Analytics Certification Program: Overview and Description

Presented by

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Purpose and Agenda

Purpose/Objectives

• To Recap our series of Webinars on Operational Analytics as a way of ‘kicking-off’ IISE’s new Operational Analytics Certification Program.

• To overview how the Program integrates all of our Webinars into a systematic program of study and development for you.

• To provide an opportunity for participants in the Webinar to ask us questions.

• Scott to Introduce participating faculty and staff

• Tee-up the Webinar

• Recap our Series of Webinars on Op Analytics

• Program Description and Overview

• Dialogue with the three of us
ISE’s Create Value by Integrating People, Strategy, Process and Technology

Enhancing the way you think and plan

Strategy

Organizational Alignment

People

Flow

Process

Changing the way we exchange value with our employees and manage our culture.

Speed of Trust

Tech Acceleration

Technology

Leveraging hyper-connectivity and the full power of IT Enablement

Performance Excellence

What we do and how we do what we do.

Operational Analytics is the Central Nervous System and Brain that enables integration

IIESE has created a unique Professional Development Program in Operational Analytics.
Faculty—Thought Leaders, Seasoned, Practical/Pragmatic, Integrated Systems Engineers

D. Scott Sink  
Sr. Advisor, The Poirier Group  
Adjunct Prof, Va Tech ISE  
Program Director

Jared Frederici  
Sr. Consultant  
The Poirier Group

Ben Amaba  
CTO - Digital Transformation with Technology Innovation and Execution  
IBM

Alex Monahan  
Operations Research Engineer  
at Intel Corporation

Matheus Scuta  
Previously with Ford now  
MBA Candidate & Roy H. Park Leadership Fellow at Cornell Johnson Graduate School of Management

Additional Faculty Support under development
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- Recap our Series of Webinars on Op Analytics
- Program Description and Overview
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Where to find our digital library of past Webinars

Over 50 recorded Webinars on a wide spectrum of Performance Excellence Topics are available to members of IISE by clicking on this link.

These 13 Webinars from the past 2 years form the foundation for our Certification Program.

**Operational Analytics**

Improve your knowledge and skills with data and fact management, how to support timely decisions and actions.

- Operational Analytics: The Data Management Role
- The Role of Data and Information (Engineered Management Systems) in Periods of Major Disruption
- Operational Analytics: New Frontiers for ISEs
- Operational Analytics: Sustainable Visual Measurement Systems
- Operational Analytics for Integrated LeanSigma Process Improvement Projects Part IV
- Operational Analytics for Integrated LeanSigma Process Improvement Projects Part III
- Operational Analytics for Integrated LeanSigma Process Improvement Projects Part II
- Operational Analytics for Integrated LeanSigma Process Improvement Projects

19 Aug—Op Analytics and Benefits Realization Management
8 July—Creating AHA Moment Visualizations
27 April—Op Analytics: The Analyst and the Decision Support Role
16 March—(you have top of the list)
9 March—Data Scientist and the New ISE
We’ve also delivered over 50 other webinars in the area of Performance and Operational Excellence.

All of these are available to members of IISE and can be accessed at this location...

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Recap our Series of Webinars on Op Analytics

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Dialogue with the three of us
Operations Analysis

The abundance and growth of machine data, which can include anything from IT machines to sensors and meters and GPS devices, is another major driver of big data solutions. In its raw format, many organizations are unable to leverage machine data. Yet disregarding this data means that organizations are making business decisions based only on a subset of available information. Leveraging machine data and combining it with existing enterprise data enables a new generation of applications that are able to analyze and gain insight from large volumes of multi-structured machine data—which in turn improves business results.

**What do you need to succeed?**

- **Get the Context**
  Overcome complexities to perform advanced analysis and provide context across different data sets.

- **Capture a Complete View**
  Access large volumes of machine, operational and transactional data and combine with other enterprise data.

- **Get Insights From Analytics**
  Release intelligence trapped in your data, allowing agile interpretation and action.

**The Results**

- **Empower the C-Suite**
  Reassure decision makers that they are acting with full knowledge & understanding of all available data.

- **Improve Reliability**
  Perform root cause analysis on data to more easily identify and preempt system failures, keeping customers happy.

- **Speed Operations**
  Help departments proactively minimize the problems and bottlenecks that stymie the flow of operations.

- **Monitor & React**
  Visualize streaming data to monitor the end-to-end infrastructure and deliver real-time alerts.

Learn more at [IBM.com/BigData]
Moving from Ad Hoc, Process Maturity Level 1 with Operational Analytics to PML’s 3-5 as appropriate.

A nice picture for Op Analytics I think...
Operational Analytics, done right, minimizes latencies and enhances ability to drive more rapid benefits realization.

Reduce the cycle times on each step in this implicit process.

Executing the Analytics Triangle effectively enables more rapid decisions and actions and positions for more rapid benefits realization.
Operational Analytics—Opportunity Framing

Avoid the Muddle
End Game: Grow Enterprise Value
Lots of versions of Balance Scorecard

Shareholder Value

Revenue Growth
- Price
  - New relocated production facilities
- Volume
  - New distribution channels
  - Telesales

Operating Margin (After Tax)
- COGS
  - Call centers
  - Telesales
  - Shared services
  - Back office
- SG&A
  - Distribution channels
  - Tax Strategy

Asset Efficiency
- PP&E
  - All facility types
    - Factories
    - Call Centers
    - Distribution Centers

Expectations
- Company Strengths
  - Decision centers
  - Headquarters
  - R&D
- External Factors

DuPont Model

Internal Processes
- Finance
- Customer
- Learning & Growth

Balanced Scorecard
Identify Projects (cont)

Relative Financial Performance (X-Year)

B = X-Year Financial Performance Relative to Peer Group
(A = Leading, B = Above Average, C = Average, D = Below Avg.

↑↓ = Improving / Deteriorating Lately

Strategic Priority

Key Business Issue

Program or Project

= Program/project A
= Program/project B
= Program/project C
= Program/project D
END GAME: Grow Enterprise Value

Improve Positioning via...
- Geographic Coverage / Offerings Provided / Served Segments / Branding/ Imaging, etc.

Managing the Exchange of Value With Stakeholders
- Altering the Give/Get, Responding to unmet and unfulfilled needs, QFD, Innovation, Rebalancing Segment Investment

Operational Excellence
- Improve Quality, Efficiency, Productivity, Innovation, Engagement, Quality of Work life, Sustainability
  - Apply principles and methods of ISE and ILSS
How the Pieces fit together

Enterprise Value Map
Practical paths to increase enterprise value
Operational Analytics enables us to understand this causal linkage to Benefits Realization.

Path between improvement projects and strategic objectives:

**Capabilities**
- A set of project deliverables enabling an organization to deliver a desired outcome.
- They can be a service, function or operation that enables the organization to exploit opportunities. Capabilities exist prior to transition.

**Benefits**
- Measurable improvements providing a business advantage. Benefits can be both tangible or intangible, are often interconnected and stakeholder specific.

**Deliverables**
- New project planning approach.
- Organizational set-up of a factory to reduce waste.
- An improved tool.

**Outcomes**
- Increased market share.
- Shorter time to market.
- Higher employee retention.

**Intermediate Benefits**

**Organizational Adoption & Alignment to Solution(s)**

**End Benefits**

**Strategic Objectives**

By What Method and How will We Know?
The Organizational System—What’s being Managed

An Extended Enterprise
An Org Unit
An Extended Value Stream
A Value Stream or Business Process
An embedded Value Stream or Process
A sub-process

Upstream Systems and Inputs: Suppliers & customer orders
The Business Processes/Value Streams
Downstream Systems and Outputs: Orders Fulfilled
The Management Systems Model—who Manages

**Leadership & management team**
(wisdom application, data/facts to information conversion process)

Who Leads, Manages

The Decision Maker
The Team of people accountable for the ‘system’ being managed

**The Business Processes/Value Streams**

Upstream Systems and Inputs: Suppliers & customer orders

Downstream Systems and Outputs: Orders Fulfilled
The Management Systems Model—what we use to help us manage

Leadership & management team
(wisdom application, data/facts to information conversion process)

Information portrayal
Information perception/understanding / insights

Data management and Operational Analytics

‘Information’ Systems support the management of systems

Upstream Systems and Inputs: Suppliers & customer orders

The Business Processes/Value Streams

Downstream Systems and Outputs: Orders Fulfilled
The Management Systems Model—who Manages, what’s managed, how we manage

Upstream Systems and Inputs: Suppliers & customer orders

The Business Processes/Value Streams

Downstream Systems and Outputs: Orders Fulfilled

Leadership & management team
(wisdom application, data/facts to information conversion process)

Data management and Operational Analytics

Data capture
Data entry
Data Organization

Information perception/understanding / insights
Information portrayal

Decisions
Actions

Information portrayal
Two Fundamental Roles involved in “Analytics” work to Support Enterprise Performance Optimization

- **Most ISE/ILSS Process Improvement Projects require that the ISE/Belt do both roles, certification requires that**
- **Data is almost never stored in a common place and are not trusted nor available**

- **the current state process in many large organizations splits data and analytics**
- **Data are stored in a common place, and are trusted and available**

### Above the line analyst role
1. What are the fundamental Questions that have to be answered?
2. What data elements do those questions require?
3. Organize the data and facts and then export to your analytics app.
4. Extract features from data through integration and manipulation of data that move us closer to answers. (torture the data)
5. Apply business acumen to data & analyses – create new knowledge
6. Apply data visualization techniques to aid in telling the right story – as in life, so in business: the best story wins ...

### Foundational data role
1. What do we need to know in order to achieve the performance objectives—what are the questions we have to answer?
2. Architect/Create the Measurement and Analytics Plan (Data Model included)
3. Select and gather data from many sources, preferably through automated extract, transfer, & load (ET&L) process
4. Create (observation, interviews, etc.) any data elements that don’t exist (ISE Measurement)
5. Assure data are cleaned & ready for analysts or you to use – data quality monitors
6. Assure data are integrated & can be joined with other data – think LEGOs
7. Assure data storage is high reliability & user-friendly – SSAS cubes, databases
8. Integration and organization of foundational data elements as well as derivative data and other key metrics of interest

The Basic Roadmap for the OA Triangle
This is a neat graphic that helps understand the Analytics Triangle. Many nuances, cultural, cognitive style, complexities to making this all work effectively in organizations.

The Data Management Role

The Bus Intelligence, Analyst, Decision Support Role
Objective 1: build out the capability to do the top half of the Op Analytics Process DO-TRAIN/COACH Approach)

Results and Benefits Realization

Decisions-Actions

Insights

Understanding

The Questions

The Development Team:
Scott Sink
Geoff
Mark
Matt
Ishan
Josh

The Development Support Team:
Jim
Marilou
Craig
Ritchi
Tony
Brandon
Lisa
Peter

The Implementation Science and Benefits Realization Role doesn’t exist yet (PMO)

The Analyst Role: doesn’t exist yet

User Interface to Power BI output: (MB)

The Data Management Role: (JC)
Data Sources, MMS, SQL tables, Query tools, and what’s called Feature Extraction in the form of Reports/Tables/some charts

We need to get this going from top to bottom instead of bottom to top!!
1. Good analytics come from good context understanding, use case clarity, *good problem statements*, clear understanding of DONE;

2. Some people have every skill – *business acumen, data management, analytics understanding* – to perform a good Operational Analytics – but it tends to result in a slow ‘craft’ development process for most and often bottom half skills don’t mean someone has top half skills;

3. Investment in the *right data foundation* has a positive ROI, as analysts move faster when they trust the data – results in faster results;

4. *Good data visualizations* can tell the right story quickly, because people are predisposed to believe what they see in a chart;

5. There is *very positive ROI* in getting Operational Analytics well designed and developed–small analytics teams can wield disproportionate influence on the bottom line;

6. Good Operational Analytics *provides more timely decisions and actions* – indeed, in most organizational systems, simple and persuasive/influential beats complex/ambiguous every time.

Adapted from S. Cunningham; Intel Corporation; 2013
The Management Systems Model and the Analytics Triangle integrate... (messy but what is really happening)

Leadership & management team
(wisdom application, data/facts to information conversion process)

Data management and Operational Analytics

Data capture

The Business Processes/Value Streams

Upstream Systems and Inputs: Suppliers & customer orders

Downstream Systems and Outputs: Orders Fulfilled
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.
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Recap our Series of Webinars on Op Analytics

Program Description and Overview

Dialogue with the three of us
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 ISE members, $725 for professional, non IISE members

Certification:
$250 for Student IISE members
$950 for Professional ISE Members, $1250 for Professional Non-Members of IISE
The Management Systems Model developed by Dr. Harold Kurstedt at Va Tech is one of our Foundational Frameworks. It is utilized to provide perspective for the Development of Operational Analytics Systems that support Rapid Improvement and Benefits Realization.
We have a number of innovative, unique Frameworks that you will be exposed to. These are proven strategies, frameworks, models that will be invaluable as you develop your ability to design, develop, implement enhanced Performance Measurement Systems for the Organization(s) you serve.

We’ve blended best practices from Intel, Boeing, Disney, John Deere, UPS, Kroger, Abbot Nutrition, IBM, Loblaws, MDS, and many others to create this integrated training program in Operational Analytics.

We’ve also blended the thinking of our ‘faculty’ who have helped develop and will help deliver this program for/with IISE and that collectively spans from 10-40 years of experience in this field.
Who was this designed for

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.

Our Faculty Member, Ben Amaba, likes this slide!!
## 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

- **Advanced Mastery Level (Advanced Certification)**
- **Reduction to Practice Skills (Certification)**
- **Foundational Principles, Methods, Tools (Certificate)**

- **Successfully Complete an OA Project**
  (prove you can reduce to practice)
- **Take the course, pass the exam**

- **Complete the Mastery Level Program (In Development)**
  Proof of breadth and depth
The Professional Development Experience

Keeping it Real and Relevant
• Bite sized Modules with learning videos and assignments that are practical and real world
• Practical and Pragmatic Frameworks and Models for learning to do Operational Analytics.
• All our faculty have significant industry experience, not a typical Academician based course. People who have been there and done it/are doing it.

Ensuring it’s Flexible to adapt to your life and work demands and schedule
• On-demand Learning Management System
• Self-paced and self-managed with coaching and guidance along the way to keep pace

Keeping it Engaging, Fun, Relevant
• Timely Recorded 1-hour webinars from dynamic, thought leaders from business and industry
• Practical Assignments aimed at helping you internalize and build understanding and skills
• We don’t ‘grade’ your practice, we’ll monitor it but the proof of the quality of your practice will be in the final exam which will be 100% based on your assignment work/practice.
Special Offer to Webinar Participants today…

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

The 10% off Coupon Code is OpAnalytics10
Thank You!

Please consider joining our remaining Professional Development Webinars the rest of the year starting on the 24th of Aug.

Contact us for More Info:

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- https://www.linkedin.com/in/jamesrswisher/

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Customer and Member Satisfaction and Feedback Survey

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You can download the deck (handouts)
You will receive an e-mail tomorrow with certificate and link to recording. You can go to this IISE link soon and get deck and recording.  [https://www.iise.org/details.aspx?id=46729](https://www.iise.org/details.aspx?id=46729)
• Sept 28: Implementation Sciences and Benefits Realization Management

https://attendee.gotowebinar.com/register/8677888242846996749

• Oct 7: Business Process Management 4.0—Glimpse of what’s ahead

https://attendee.gotowebinar.com/register/7929275855425721356