FOUNDRY 4.0 | Engage & Explore
TRAINING & ONLINE SEMINAR SERIES

MODULE 01
INDUSTRY 4.0 ASSESSMENT
IMPORTANCE & AUTOMATION
INDUSTRY 4.0 ASSESSMENT
Importance & Automation

Todd Hutcheson, University of Northern Iowa
welcome
Create *resiliency* in the FOUNDRY & CASTING INDUSTRY through the implementation of Industry 4.0 technology.
Todd Hutcheson
Executive in Residence & Business Professor
University of Northern Iowa (UNI) Business & Community Services (BCS) Center for Business Growth & Innovation (CBGI)

32+ Years at a major A&D Prime and Sub-contractor
4+ Years as MBA Program Director at a Midwest Liberal Arts College
3 Years at UNI as a Strategic Management Professor & Small to Medium-sized Business Consultant
CBGI - providing targeted solutions, guiding small and mid-sized enterprises as they thrive, grow and succeed, assisting firms in overcoming obstacles, helping identify new opportunities, and delivering value businesses
Undergraduate in Industrial Technology, Master in Business Administration, I4.0 Certificate in Progress at Massachusetts Institute of Technology
MANUFACTURING’S PERFECT STORM

Our CURRENT SITUATION requires a totally different approach
“If you fail to plan, you are planning to fail”

~ Benjamin Franklin
WHY CONSIDER Industry 4.0?

14.0 OFFERS

1. Increased Efficiency and Productivity
2. Predictive Maintenance
3. Enhanced Quality Control
4. Customization and Flexibility
5. Supply Chain Optimization
6. Cost Savings
7. Innovation
8. Real-time Data and Analytics
9. Competitive Advantage
10. Global Connectivity
What is INDUSTRY 4.0 & How did we get here?

Industry 1.0
Around 1760
Mechanization

Industry 2.0
~1860s onwards
Automation

Industry 3.0
~1970s
Digital

Industry 4.0
~ 2000 - Today
AI & ML,
cyber physical systems

Industry 5.0
Has already started!
Mass customization &
cyber physical cognitive systems

Note:
Industry 4.0 applied to an industry can become “Foundry 4.0”, “Manufacturing 4.0”, “Logistics 4.0” … all apply similar principles.
Understanding INDUSTRY 4.0 Technologies – Four Broad Buckets

Managing Information
- Big Data & Analytics
- Cloud Computing
- Horizontal & Vertical System Integration
- Cyber Security
- Internet of Things (IoT)

Producing & Performing
- Autonomous Robots
- Additive Manufacturing
- Designing & Testing
- Augmented Reality
- Simulation & Digital Twin

Business Success Elements
- Organizational Culture
- Business “Wild Cards”
INDUSTRY 4.0
Converting Data Into Useful Wisdom

1. DATA
2. SORTED
3. ARRANGED
4. PRESENTED VISUALLY
5. EXPLAINED WITH A STORY
<table>
<thead>
<tr>
<th>VALUE</th>
<th>Description</th>
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<tr>
<td>Increased efficiency and productivity</td>
<td>Industry 4.0 technologies can enable real-time monitoring of production processes and machine performance, leading to greater efficiency and productivity.</td>
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<td>Improved product quality</td>
<td>With the help of Industry 4.0 technologies, manufacturers can reduce defects, ensure consistency, and improve quality control in their production processes.</td>
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<td>Industry 4.0 technologies can improve safety in industrial environments by automating dangerous or hazardous tasks and providing real-time monitoring of safety conditions.</td>
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<td>By optimizing production processes and reducing waste, Industry 4.0 technologies can help manufacturers save costs and improve their bottom line.</td>
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<td>Overall</td>
<td>The implementation of Industry 4.0 technologies has the potential to transform manufacturing and industrial processes, leading to greater efficiency, productivity, safety, and customer satisfaction.</td>
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Assessments

GOAL: Provide Applied, True Business Value

Key Business Performance Indicators

Implementations, Integration

Technology Research & Development

BEGINS WITH ➔
The Importance of I4.0 Assessment and Overview of the Automated Assessment Process

Data Gathering: coming soon!

The Assessment: TBD

KPI Connection: TBD

Report Generation & Action Plan Creation: TBD
The Importance of I4.0 Assessment and Overview of the Automated Assessment Process

01 The Importance of I4.0 Assessment and Overview of the Automated Assessment Process

02 Data Gathering: coming soon!

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04 KPI Connection: TBD

05 Report Generation & Action Plan Creation: TBD
Elements of I4.0 Improvement Implementation

- Data Collection
- Assessment
- Key Performance Indicators
- Action Plan & Implementation
Why Begin with Assessment?

Many I4.0 Assessments exist ... most exhibit one or more of the following issues:

• Lack of an “ease of use” in gathering inputs
• Difficulty gathering honest inputs from a cross-section of leaders
• Difficulty maintaining an ability to offer honest, objective inputs without confrontation
• Disconnects between assessment scores and needed impact on business objectives/KPIs
• Long waits for conclusions including some not discussed in initial review meetings
• Quick turnaround of summary reports written at too high a level high to be useful
• A lack of follow-up connecting organizations with enabling integrators and I4.0 technology

Honest Assessment and Feedback is a Foundational Key to Success
Data collection:
- Code and location given to company/individuals

Complete assessment administered via Qualtrics or Google Sheets:
Data collection from individuals at a partner company

DATA

Gathered by CBGI Team, fed into core spreadsheet (eventually creating automated reports)

Size, Industry, Location, etc. dependent

AI help to generate key points
Discussion to review output

Summary Report
- Priorities
- Action Plans
[Can be initially AI populated, then adjusted]

Top 5 Prioritized Actions – Cost: Benefit (Impact) priority order
PHASES OF Assessment Automation Development

Phase 1: Relatively manual data collection & consolidation
A. Multiple user inputs gathered independently per partner organization
B. Collected by UNI-CBGI into a consolidation spreadsheet for the organization
C. Facilitated discussion with organization based on consolidated average outputs

Phase 2: Automated data collection & consolidation
A. Automated collection of the user provided data for an organization using Google Forms
B. Automated gathering, consolidation and analysis of the user data into a spreadsheet/database
C. Automated creation of an I4.0 Technology report card for discussion

Phase 3: In parallel, working to connect I4.0 pillar data for organization KPIs impacted by implementing technology in that pillar

Phase 4: Creation of a summary report, potential actions and prioritized planned actions based on KPI impact... maximizing business value

Phase 5: In parallel, creating AI queries & prompts to automate the creation of the summary report
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Whether you're a large-scale enterprise or a growing business, our Foundry 4.0 Readiness Assessment Tool offers a foundational understanding of where you stand in the journey towards Industry 4.0. By harnessing the power of data-driven insights, you can make informed decisions that set the stage for innovation and sustainable growth.

We invite you to explore the possibilities and learn more about our Foundry 4.0 Readiness Assessment Tool. Reach out directly at todd.hutcheson@uni.edu or call (319) 273-6008 and I will answer any questions and get you started. We look forward to the opportunity to assist you on this exciting journey and together we can begin to reshape the future of the foundry industry.
For Additional INFORMATION:

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Connect

with US!

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Thank you!