

NEW Manufacturing Alliance
INDUSTRY 4.0 TASK FORCE – WEBEX MEETING MINUTES
Thursday, August 20, 2020 – 1:30 to 3:00 PM

ATTENDEES: Adonica Randall-Abaxent LLC, Amy Kox-NWTC, Anirudh Nadkarni-Wipfli, Ann Franz-NEWMA, Bruce Wisnefske-Sargento Foods, Chris Lipski-Vantage, Dan Heiser-St. Norbert College, Dave Kriescher-Braas Company, Debbie Thompson-NWTC, Jake Rohrer-Wipfli, James Corpus-Fox Valley Metal-Tech, Jill Thiede-NWTC, Jim Broennimann-GSC, Joe Girard-Wipfli, John Irwin-Michigan Tech, Jonathan Austin-Suburban Electric, Jordan Kasinskas-GSC, Michelle Schuler-Microsoft TechSpark, Mike Schlagenhauser-Acuity, Nate Paul-Suburban Electric, Nicholas Schmidtke-GSC, Paul Link-Alliance Laundry Systems, Rick Roeske-PCMC, Scott Herron-New Resources Consulting, Steve Straub-FVTC, Stewart Larsen-CCCP, Tim Duley-Alliance Laundry Systems, Tony Olson-Excelion Partners

WELCOME & PAINT COHORT UPDATES

- A new Industry 4.0 Task Force chair is being sought, as Jeff Blackman accepted another position at Oshkosh Corp. and will no longer be able to lead the Task Force. The chair must work in the manufacturing sector. Members can contact Ann if interested.
- The paint cohort is going well and will be meeting again on August 24, 2020. Members are encouraged to contact Ann if they are interested in participating.
- After 30 years of working in industry, [Jill Thiede](#) recently accepted an associate dean position in Trades and Engineering at NWTC. Opportunities for certificates, seminars - learning that can skill or reskill people are being developed. Manufacturers are encouraged to contact Jill to share how NWTC can better support their organization's educational needs.

THE INDUSTRY 4.0 BUZZKILL! - SUBURBAN ELECTRIC

For more information, contact:

Jonathan Austin – Automation Engineer, jaustin@suburbanelectric.com

Nate Paul – Division Manager, npaul@suburbanelectric.com

The next industrial revolution has so many buzzwords.... AI, big data analytics, IIoT, SCADA, process monitoring, etc. "How do we get there? Where do we start? I think we're still in Industry 2.0...." In order to move down the path of implementing and utilizing Industry 4.0 tools to create massive value in your operations, it requires having an in depth knowledge of where you're at today. This discussion will focus on why understanding the current state of your machines, devices, and controls is essential to beginning your Industry 4.0 journey.

Organizations are all over the spectrum regarding Industry 4.0. Some have an established plan or are migrating towards it, while others may not know where to start. Basic building blocks are as follows:

Site Assessment – What is your organization's current state? What should the organization upgrade? Understand where you are and where you need to go. The degree of assessment detail can be quite large.

Walkthrough – Follow through with the preliminary expectations. Early discussions will establish what will be done. Consider network and architecture, and equipment automation components.

Report – After the walkthrough, create a report with the findings that can be presented to management. Be straightforward with everything that was addressed. Use images/videos where appropriate. Gauge what the investment will be.

Changing the Mindset – A small investment can save large amounts in the future. Minimize downtimes by not having to go back and do upgrades.

Key Considerations – Effort vs. impact, KPIs, Cybersecurity, Risk Mitigation – What do you want to measure to get better speeds, output? Having better data trends can allow for more informed and quicker decisions. An option is to start small at a local or machine level. Work out the kinks and see how ROI progresses. This can give buy-in to invest in Industry 4.0. Cybersecurity is a key component, especially as more data is being captured, making a solid cybersecurity plan essential.

Next Steps (Endless Opportunities) – Maintenance KPIs, Production KPIs, Business Intelligence – Start investing in Industry 4.0.

ADDITIVE MANUFACTURING - GSC

For more information, contact:

Nick Schmidtke and Jim Broennimann <jim.broennimann@gsc-3d.com>

Discussion includes additive design, trends, materials, and case studies on the use of composites in manufacturing. STEAM programs are recognizing the importance of Additive. K-12 schools are rapidly adopting Additive programs, while more universities are offering certificates and degrees focused on Additive Manufacturing. CAD and Additive go together, allowing the creation of concepts and functional projects. These technologies bring great people to work for your company.

GSC has over 20 years of experience in 3D printing solutions. Additive manufacturing allows the creation of lighter, more complex design and has become a crucial part of manufacturing. Half of the world’s manufacturing equipment will be replaced in the 4th Industrial Revolution. 50% of what is being produced now will be gone.

Affordable, hobbyist-level machines allow for low-cost introduction to Additive Manufacturing. U.S. investments in Additive Technology have greatly increased each year since 2013, with 47% of manufacturers using this technology. Why are industrial machines worth the investment in Additive Manufacturing?

<ul style="list-style-type: none">• Accuracy/Repeatability• Reliability• Size• Throughput	<ul style="list-style-type: none">• Special Capabilities• Software/Integration• Materials
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This technology creates chemical resistant parts that are lighter and stronger than 6061-T6 aluminum, with virtually zero touch time. Direct from CAD to Software to Part. In nearly 50% of cases, customers are replacing aluminum or steel with printed composite parts and are drastically reducing cost, touch and lead times by as much as 95%. Geometries that are often challenging to machine can be created with ease. Additive manufacturing use today includes; functional prototyping, proof of concept, manufacturing aids, bridge tooling, replacement parts/tools, end-use parts, and low/mid volume production – metal plastic.

The savings per tool can be several hundred or even thousands of dollars. However, the greater savings is often seen in massive lead time savings, light-weighting, and manufacturing flexibility. It is common to use shelf materials and makes sense. GSC has been working with Markforged and HP.

Markforged Metal Materials <ul style="list-style-type: none">• 17-4 stainless steel• A2 tool steel• D2 tool steel• H13 tool steel• Inconel 625	HP Multi Jet Fusion <ul style="list-style-type: none">• Advanced, functional, full-color prototyping• Low-medium production runs (under 10,000)• Real thermoplastic (Nylons, Polypropylene)• Solid parts• Isotropic strength• Designed to replace injection molding
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ST. NORBERT COLLEGE’S NEW DATA ANALYTICS DEGREE – DAN HEISER

The college has a new Data Analytics major. Participants of this program will have exposure to innovative methodologies that support data-driven decision-making.

SNC'S DATA ANALYTICS CURRICULUM Emphasis on Application	
<ul style="list-style-type: none"> • Decision-making • The nature of data & algorithms • Ethics of data & analytics • Data acquisition & cleaning project planning & management • Visualization & dashboards 	<ul style="list-style-type: none"> • Programming (R & Python) • Modeling & Analytics: <ul style="list-style-type: none"> ○ Diagnostic, predictive, prescriptive ○ Machine learning techniques • Data capstone project

Industry leaders or data are needed for the program in various areas.

- Dataset library
- Guest speakers
- Project partnerships (live or simulated)
- Internships
- Career & curriculum insights

For more information about how you can partner with SNC for this program, contact:

Program Coordinator: Marc Schaffer, Ph.D. marc.schaffer@snc.edu	Director of Business Engagement: Amy Kunding amy.kunding@snc.edu	Schneider School Dean: Dan Heiser, Ph.D. dan.heiser@snc.edu
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INDUSTRY 4.0 - WIPFLI

For more information, contact:

<p>Jake Rohrer, Senior Consultant, Organizational Performance jrohrer@wipfli.com Areas of Focus:</p> <ul style="list-style-type: none"> • Process improvement through technology applications • Industrial Internet of Things (IIoT) • Technology adoption & change management • Organizational strategy & planning 	<p>Anirudh Nadkarni, Solutions Manager, BI & Analytics ANadkarni@spiderlogic.com Areas of Focus:</p> <ul style="list-style-type: none"> • Performance management using data & analytics • Industrial Internet of Things (IIoT) • Solution architecture • Data integration & management
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Industry Research & Trends

IoT – Devices enriched with “embedded computing” that allow them to interact and communicate with each other.

- Internet of Things (IoT)
 - Advanced Sensor Technology
 - Cloud computing
- Connected Systems
- Advanced Analytics, AI/ML
- Cybersecurity
- Autonomous & Cooperative Robots
- 3D Printing
- Wearables

According to a 2015 independent study commissioned by Cisco, there are +60 million advanced manufacturing machines worldwide and almost 90% of them are not connected. In a 2020 study of 600+ manufacturers done by the MPI group:

- 83% saw Industry 4.0 as very or extremely important to their business.
- 51% saw Industry 4.0 as being a competitive differentiator already (an additional 42% said it would be in the future).
- 42% of respondents have seen productivity gains between 6-105.
- 19% of respondents have seen productivity gains of over 10%

In the same 2020 study, it was determined that 49% of manufacturers struggle with identifying opportunities/benefits of Industry 4.0 and 20% were unsure of where/how to get started.

It can be difficult to change the mindset if you don't have a technology mindset. Instead of people creating data, technology creates data. Instead of people driving behavior, technology drives behavior. People use a technology platform vs. technology tools. It is a cost center vs. a profit center.

It is important to realize you can't jump into automation right away. Start with a machine and system integration, followed by visibility and insights that lead to automation. A Wipfli case study involving a metals contract manufacturer was shared. Value statements and an anticipated ROI was established.

Return on Investment

- Improving machine in-cycle time
- Reducing labor variances
- Reducing material variances
- Reducing turnover by improving engagement
- Elimination of data recording and data entry activities
- Elimination of report gathering activities

Beginning the Journey

- Learn about digital transformation and develop short and long-term strategies.
- Create a value statement. Why are we undertaking this journey?
- Develop use cases. How do we want to use data for decision-making?
- Gather information about your machines – make, model, year of manufacture, control type, etc.
- Consider technology ecosystems. How do we breakdown silos?
- Develop a backlog of ideas and continue iteration.

Project Planning

Identify – Process opportunities & scenarios, metrics & definitions, systems & human consumers

Plan – Data collection requirements, system & data integration approaches, visual & statistical analytics approaches, tools & technology options, budgeting & prioritization

Implement – Technology procurement, technology implementation, people & technology enablement

Typical Architectural Components

- ERP Software
- Data Capture at Machines
- Data Analytics
- Operator Context to Machine Data
- Performance Improvement

NEWMA/MICROSOFT DATA ANALYTICS TRAINING UPDATE

Ann will be sending an email to the membership to recruit 1-2 participants from each company to participate in the Data Analyst certificate cohort. The first cohort will run from September 14 to November 14, 2020 and will include LinkedIn online training.

NEXT MEETING DATE/TIME/LOCATION

The next Industry 4.0 WebEx meeting is on **Thursday, September 17, 2020, 1:30 to 3:00 p.m.** Members are encouraged to contact Ann if they would like to share a case study at the meeting. Agenda:

- ✓ Welcome & Paint cohort updates
- ✓ Rockwell Automation Presentation
- ✓ Improving Technology Acceptance and Adoption
- ✓ NEWMA/Microsoft Data Analytics Training Update
- ✓ Next Meeting Date/Time/Location/Agenda