NEW Manufacturing Alliance
INDUSTRY 4.0 TASK FORCE – WEBEX MEETING MINUTES
Thursday, November 19, 2020 – 1:30 to 2:30 PM

ATTENDEES: Adonica Randall-Abaxent, **Alex Gibson**-Saggezza, **Ann Franz**-NEWMA, **Bob Webb-**Nsight/Cellcom, **Brendon Wallace-**Trillium Staffing, **Clifford Muse**-Willscot Mobile Mini, **Dan Fuhrmann**-Michigan Tech, **Dan Heiser**-St. Norbert College, **Dan Mincheff**-NWTC, **Dawn Zhu**-Foxconn Industrial AI, **Debbie Thompson**-NWTC, **Dennis Somers**-WI Lift Truck, **Dustin Kozlowski**-Saggezza, **Gerry Aase-**SNC, **Jess Thiel**-Insight, **Jim Corpus**-Fox Valley Metal-Tech, **Joan Turba**-NWTC, **Jake Manches**-MTU, **John Irwin-**MTU, **Mark Kralovec**-PCMC, **Matt Adamczyk**-Microsoft, **Patrick Greenwell-**Oshkosh Corp., **Sheila-Schetter**-LTC, **Scott Herron**-New Resources Consulting, **Scott Rauscher-**EMT International, **Scott Valitchka**-15 Dots, **Scott Wagner**-MTU, **Steve Straub**-FVTC

WELCOME – UPDATES: PAINT COHORT & DATA ANALYTICS TRAINING
The paint cohort continues to move forward. Alliance Laundry Systems, Ariens Co. and KI are partnering to study paint-climate effects.

The recent Data Analytics training had 18 completers, representing 13 companies. The modules covered:
- Learning Data Analytics
- Data Fluency: Exploring and Describing Data
- Excel Statistics Essential Training
- Learning Excel: Data Analysis
- Learning Data Visualization
- Power BI Essential Training
- Tableau Essential Training

Over half of those who completed the course submitted a follow-up survey. All of the respondents felt the training was favorable and would like this learning continued. The Alliance will continue offering the Data Analytics training.

INDUSTRIAL AI: A SYSTEMATIC APPROACH TO ACCELERATE INDUSTRY 4.0 ROI
Presenter: Dawn Zhu, PhD – Director for Industrial AI Business Development and Partnerships
Dawn.zhu@fii-usa.com
As manufacturers are assembling their task forces to tackle Industry 4.0 projects, questions often arise: *What data should be collected? How can data be converted into useful information that drives financial performance?* In this session, Dawn Zhu shared how a systematic approach using Industrial AI tools and methodologies can help set your plan and accelerate your ROI.

Who is Foxconn Industrial Internet (Fii)?
- 2013 - Fii concept is born as an early adopter of Industry 4.0 principles.
- 2014-2015 – Founder Terry Gou drives internal Digital Transformation.
- 2016 – Fii platform was launched at a founding conference for Alliance of Industrial Internet.
- 2017 – Foxconn makes historic investment in Wisconsin for AI/5G R&D and Advanced Manufacturing hub.
- 2018 – Fii listed on Shanghai stock exchange.
- 2019 - Fii selected as 1 of 16 World Economic Forum's "Lighthouse" factories.
- 2019 – Fii named to MIT Tech Review's "50 Smartest Companies", first time as a subsidiary.

What is Fii?
- 5G & IoT – Private industrial mobile network solutions
- Industrial AI – Advanced custom or standard AI solutions and training
- High Performance Computing – Host software at Fii data center for best compute performance.

Industrial AI: A Systematic Approach to Accelerate Industry 4.0 ROI
Industry as a New Frontier for AI – Concrete and Exact Problems in Industrial Systems
Quality, Efficiency, Downtime, Inventory, Maintenance, Delivery
- Asset Health Maintenance
- Product Inspection
- Inventory Scheduling
- Process Parameters

New Opportunity Spaces for Industrial AI – Uncover the Invisibles for Value Creation
Solve: Visible problems
Avoid: Decreased accuracy, wasted resources, human error, deteriorated equipment

Key Technical Elements of Industrial AI
- Analytics: Algorithm & its application modeling.
- Big Data: Manage 3B challenges (Bad, Broken, Background).
- Computational Platform: Integrate endpoints with cloud and distributed systems with centralized systems.
- Domain Knowledge: Mechanisms, process flow, system engineering, and optimization objectives.
- Evidence: Current state of the system and insights that support decision-making.
- Feedback: Integration with control systems to achieve a closed-loop from decision-making to operations.

Systematic Approach of Industrial AI
4 Technical Buckets: Data Technology (DT), Analytics Technology (AT), Platform Technology (PT), Operation Technology (OT)
- Configuration – Proactive and Precision Actions to Avoid - Value
- Cognition – Visualization, Prioritized and Optimized Decisions - Decision
- Cyber/Cloud – VM for Shared and Scalable Computing - Knowledge
- Conversion – Algorithms, Analytics and Data Processing - Insight
- Connection – Reliable Data Collection and Connections – Data

CASE STUDY: 'Suction Nozzle PHM'
Process Flow of SMT
The IC mounter in the SMT process use vacuum suction to move electronic parts.
- Printed Circuit Board (PCB)
- Solder Printer
- Automated Optical Inspections (After Solder Printer)
- Pick and Place Machine
- Automated Optical Inspections (Before Reflow Oven)
- Reflow Oven
- Automated Optical Inspections (Final)
Suction Filter Cleanliness, Vacuum Value, Suction Nozzle Life, Production Yield; Waste

Case Study: Suction Nozzle PHM	
Traditional Approach	**Fii Industrial AI**
No label. Scheduled maintenance increases waste.	Collect useful data and uncover key factors.
Manual filter inspection increases costs and reduces yield.	Establish a model to evaluate cleanliness of suction filters.
Criteria is different for inspectors which results in a 10% missed detection rate.	Achievement of reducing failure and missed detection rates.
-	Shorten the manual operation time and produce higher yield.

Data can be visualized in different ways for different functionalities. Identifying the degree of dirtiness of the nozzle filter was analyzed; costs due to wasted materials and suction nozzle inventory. Using Fii Industrial AI, resulted in significant reductions in materials and costs.

CASE STUDY: Pre-Wave Bent Pin Detection
- Asset Health Maintenance – Machine Intelligence – Quality, Efficiency
- Product Inspection – Machine Vision – Downtime
- Inventory Scheduling – Smart Scheduling – Inventory
- Process Parameters Optimization – Smart SOP – Maintenance, Delivery

Talent Preparation for Intelligent Transformation
Talent for enterprises seeking Industrial Intelligence Transformation requires knowledge of four aspects.
- DT – IoT, DAQ, Network, SCADA, PLCs, Database
- AT – Computer Science, AI, MO, HPC & Other Computing Technology
- PT – Cloud Platforms
- OT – Manufacturing & Industrial Specific Knowledge

Course aimed to teach the technical elements of Industrial AI:
Book: *Industrial AI: Applications with Sustainable Performance (2019)* by Dr. Jay Lee, Vice Chairman, Foxconn Technology Group
Industrial AI Curriculum – Applications with Sustainable Performance
- Introduction to Industrial AI – Basic IAI methodology for decision makers
- Technologies of Industrial AI – Algorithm techniques for intelligent transformation
- Killer Applications of Industrial AI – Application scenarios for industry

A 20% discount is being offered through the end of the year to NEWMA members for the 'Industrial AI' online course. Contact Dawn Zhu for more information. Inform her that you are a member of NEWMA to receive the discount.

INDUSTRY 4.0 CASE STUDY: WILLSCOT & SAGGEZZA
Presenters:
Alex Gibson, Saggezza
Dustin Kozlowski, Saggezza
Clifford Muse, WillScot
WillScot's IT department delivered three major projects during the entire calendar year of 2019. Saggezza was brought in to transform their IT department. Using a combination of new; people, processes, and technology, Willscot was able to deliver 15 projects during the first six months of 2020 (a 10x increase in productivity). This was all done during a company merger and during the COVID-19 shutdown. The presenters discussed the training, Agile adoption, business process changes and the level of respect it earned to achieve the 10x productivity boost.

Company Information: WillScot specializes in portable storage solutions such as; office trailers, portable sales offices, ground-level office, modular complexes, secure onsite storage, and industrial solutions.

Saggezza (NEWMA Associate Member) is a management and technology consulting firm that helped transform WillScot, giving the organization a 10x productivity boost via their six practice areas:
- Strategy & Innovation
- Digital Experience
- Data & Analytics
- Salesforce
- Engineering
- Automation

An Agile Success Story: Through people, process and technology, Saggezza helped WillScot significantly increase their productivity.

Background

WillScot sought meaningful productivity improvement. Their IT department desired improved timeliness in meeting deliverable deadlines and reduced rework from defects following deployment. Root cause analysis revealed opportunities to remove organizational silos and improve communication across WillScot's business units.

Solution
- Assessment workshop and process maps to uncover communication breakdowns.
- Agile Training for all staff.
- Review existing technology to determine and introduce tools for communication and planning.

Results
- 10x annualized increase in productivity.
- Cohesive, repeatable development process between IT and business.
- IT seen as a partner and technology innovator.

It takes work and commitment across the organization do it right. This commitment was well received across WillScot. They have been able to achieve a lot of things in the last year. To transform the business, their entire IT department worked together to take inventory of everything they had:
- Applications
- Servers
- Number of people supporting applications
- Tools
- Type of work coming through the pipeline from business units

Inventorying their assets allowed WillScot to know how to structure things moving forward. You have to understand what the problem is, where you are, and if you need help. After documenting their systems and organizing themselves with help of Saggezza, they were able to work more efficiently. Teams were defined. Once there is commitment, it is amazing how fast projects and enhancements can be implemented and tracked.

Saggezza allowed WillScot to have a platform to ask questions. People need to understand how the business functions. They have had a great response from team members and the businesses. With the new process in place, WillScot can complete 11-15 projects which was unheard of in the past.

WillScot has had a new CIO as of November 2019. They were undergoing a merger in 2019, in addition to their more recent merger. In mid-March the pandemic hit, but they still were able to do an acquisition. This underscores the value and process of the work done regarding how they organize people, work, technology and tools. They trained on Agile and tools. The book *'Making Work Visible'* offered a model that is now adopted by the company.

Evolution of WillScot's Change
- Needed to start tracking and make work visible, with end dates.
- Had overworked people being pulled in different directions.
- Started to align people with projects/initiatives.
- Met daily with staff.
- Considered smaller enhancements. Larger projects went through an intake process.
- In a little over 6 months, they were able to deliver a number of larger projects, during a pandemic and merger.
- Tensions lessened. Attendance grew.
- Work was made visible for business and IT. They could see what was happening.

- IT started to become a strategic partner and think like an innovator. Power went to the teams. IT could invest time and energy in new ways.
- By bringing in new processes, things improved quickly.
- The new process changed how they operate and employee mindsets.
- Turned application managers into Agile spokespersons. Application managers got out of their comfort zone to showcase this new innovation.
- Hired project managers to help drive the organization forward.

2021 INDUSTRY 4.0 TASK FORCE PROGRAMMING
Industry 4.0 Career Spotlights & Replication of the NEWMA industry 4.0 Study
One of the goals of this Task Force is to educate and show how Industry 4.0 can be adopted by businesses. Member organizations will continue to be asked to present in 2021, as this helps all members. Several college reps attended today's meeting and discussed some of their Industry 4.0 programs.

FVTC's Automation Technology pathway offers two Associate Degrees. Electro-mech and Automation Tech first year curriculums are common. They have invested tremendously with industry to be cutting edge, making their graduates in high demand. FVTC's Process Engineering program aligns well with Industry 4.0.

LTC offers a couple of tracks in electro-mech. They are doing a lot of industry training regarding robotics and robotics maintenance. Next fall, LTC will be offering a Manufacturing Engineering program. Trouble-shooting and problem solving are new Industry 4.0 classes being offered in fall. The tech colleges are dedicated to purchasing and providing technology training. Support from industry and their feedback helps keep their programs in-demand.

St. Norbert College has had a great response for their newly launched Data Analytics major. Gerry Aase was introduced by Dan Heiser as an SNC Supply Chain Management professor. Gerry is seeking SCM program design advisors, industry projects with data (process/quality improvement), and class speakers (15 minute Zoom discussions). Contact **Gerry Aase** for more information.

NWTC's Corporate Training & Economic Development works with companies and offers Data Analytics training. NWTC would like to gather case studies and cross train employees. Contact **Joan Turba** for more information.

MTU is working with high school students through their Mechatronics Program. High school students are able to work towards and/or complete their one-year Mechatronics Certificate. This Certificate serves as a pathway that can go all the way to a Master's Degree for Mechatronics.

Ann shared that it would be beneficial in 2021 to have each college give an overview of their Industry 4.0 offerings. There will be Fast Forward Grant dollars available for companies to train their employees. Ann will do a survey of the Task Force to identify potential training projects that can be offset with grant dollars.

Ann will likely receive another grant and would like to put those dollars toward student led activities, individual or group projects. The student(s) could be a potential future employee(s) for your company. Companies will need to identify their potential student led projects. Future trainings for incumbent workers will also be considered. The Data Analytics training will be offered again due to its success.

Members discussed replicating the 2019 Industry 4.0 survey that was conducted. 2021 would be the 2-year mark of this study. Should the Task Force move forward and replicate the study again in fall 2021 *or* wait another year? Questions/considerations:
- Are more companies getting engaged with Industry 4.0?
- Does your company have an Industry 4.0 plan? If not, why?

- If your company has an Industry 4.0 plan, how much money is being allotted for it?
- What does your organization think it will cost for the talent?

Ann will send the survey to members in early December for discussion at the January 28 meeting.

UPCOMING ALLIANCE EVENTS
QUARTERLY FULL MEMBERSHIP ZOOM MEETING
Tuesday, December 8 - 8:30 to 10:30 am
The 2021 Northeast Wisconsin Manufacturing Vitality Index results will be announced. A guest speaker; Ted Abernathy of Economic Leadership LLC, a North Carolina based economic consulting company that has worked with WMC on its Wisconsin Workforce Competitiveness Evaluation report, will present. Regional, State and national data will be shared, giving a glimpse of what to expect in 2021 regarding workforce and economic trends. The program will also include an overview of the past year and what's to come in 2021 for the NEW Manufacturing Alliance.

NEXT MEETING DATE/TIME/MODALITY/AGENDA
Any manufacturer member interested in serving as the Industry 4.0 Task Force chair is encouraged to contact Ann. The next Industry 4.0 WebEx meeting is on Thursday, January 28, 2021, 1:30 to 3:00 p.m. Members are also encouraged to contact Ann if they would like to share a case study at the meeting. Agenda:
- ✓ Welcome & Updates
- ✓ Recap Recent Events
- ✓ Review Survey
- ✓ 2021 Calendar
- ✓ NEW ERA Grant
- ✓ Next Meeting Date/Time/Location/Agenda