Industry 4.0
Are you & your businesses ready?

Purpose of the Workshop:

To strengthen economic development conversations and follow up by:

• Knowing the basics and language of Industry 4.0
• Recognizing industry adoption
• Gauging a businesses’ readiness for transformation
• Sharing useful resources that can help your businesses prepare for disruption and opportunities.
Your Industry 4.0 Team for the Afternoon

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Think About a Business...

One business in your community that represents the types of businesses you serve.

Picture its owners/managers, product or service, employees, and customers.
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!
Mass customization
& cyber physical
cognitive systems
Where Industry 4.0 Makes a Difference

Using Technology to:
- Improve customer experience (CX)
  - Quality
  - Speed
  - Personalization
  - User-friendliness
  - Consistency
- Support process efficiencies in
  - Sales
  - Product/Service
  - Delivery

Nine Basic Industry 4.0 Technologies

Everything is Changing!
Every Industry – Not Just Manufacturing!

- Health care
- Retail
- Hospitality, Restaurants, Travel
- Construction
- Agriculture
- Service-based

Think about how technologies could apply to different industries

COVID-19 has accelerated the need to adapt
Understanding Industry 4.0 Technologies

Three Broad Buckets of Industry 4.0 Technologies

1. Managing Information
   - Big Data
   - Cloud Computing
   - System Integration
   - Cyber Security
   - Internet of Things

2. Designing & Testing
   - Augmented Reality/Virtual Reality
   - Simulation

3. Producing & Performing
   - Robotics & Automation
   - 3D Printing – Prototyping & Tooling
Managing Information

- Big Data
- Cloud Computing
- System Integration
- Cyber Security
- Internet of Things

Designing & Testing

- Augmented Reality/Virtual Reality
- Simulation
Smart Main Streets & Tourism=Less Guessing

A smart retail store leverages a number of technologies including:

- Beacons
- Near-Field Communication (NFC)
- Geofencing (VIDEO)
- QR Codes
- IoT and Artificial Intelligence (AI)

Investing in a smart retail store is relatively cheaper. Proximity marketing solutions such as beacons and geofencing and technologies such as NFC tags and QR Codes cost less than $70, whereas setting up a retail store costs anywhere between $2000 – $50,000.

Hey, Where They Going?

- Heat maps of customer, visitor & tourists’ interests & patterns
- Enables prediction
- Buildings, districts, events, shops, school events etc.

Mom & Pop 4.0

- Smart Mirrors & Showrooms
- Smart Fitting Rooms
- Smart Tags & Shipping
- Customer Personalization
- Cross-Store/Event Promotions
- Product Visualization
Smart Retail

- Robotics
- IoT and Big Data
- Cloud Computing
- Additive Manufacturing (3D Printing)
- VR/AR

What are You Seeing in Jasper County?

- Manufacturing
- Main Street Businesses
- Restaurants, Hotels, Travel
- Construction
- Service Based Businesses
- Healthcare & Professional
- Agriculture
- Real Estate
Industry 4.0
Why should you care?

Ind. 4.0 Impact of Inaction on Businesses & Communities

• Adopting these technologies will become critical to competitiveness
• Large firms will begin to require use among their suppliers and partners – and just move on to someone else!
• Seamless digital integration will become key – customers will begin to expect more than just the part, item or service
• Your workforce – will there be job losses - or gains?
How the Future is Impacting Workforce

• Automation: Retraining and training. Evaluating competitiveness and potential for automation
• Preparing the pipeline: What are your local programs?
• Enabling the GIG economy through the Internet of Things
• Remote workers

*McKinsey & Company asked global HR professionals about missing skills for an increasingly automated world. They identified problem-solving, critical thinking, innovation, and creativity as being most needed, followed by the ability to deal with ambiguity and complexity.*

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Customers demand integration
- Mass customization, flexibility, visibility, speed

Workforce availability
- Automation of direct labor, reduction of bureaucracy and paperwork, appeal to new talent

Quality
- Process control, documentation and traceability

Reduced cost of 4.0 technologies
- Cloud computing, intuitive programing, IoT ready equipment, remote support

Why businesses will move to Industry 4.0

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Customer Behavior Shifts

Behavior Shifts:
• E-Commerce Acceleration
• Contactless Delivery Options
• Greater Focus on Spending Less and Saving More
• Bulk Buying
• Digital Customer Service Interactions

What they want:
• Quality
• New Products and Services
• Cost
• Product Enhancements
• Customization
• Faster Delivery

What Industry 4.0 looks like in Central Iowa

Cline Tools Video Clip
As we start to invest in automation for Plant 7, we're looking at a new generation of AMRs. These new, versatile units can move pallets, stacked carts, flat carts and more. Like the AMRs in Plant 4, they'll use laser-based, natural navigation. However, these units can be programmed by our engineers onsite with a tablet and can find entirely new routes through the plant when their path is blocked. We're planning to invest in four of these units for Plant 7 to serve nine of the 11 assembly lines in the main production facility.

AMRs have three major impacts:

- **Reduce fork truck traffic in the main aisles.** By reducing the need to have fork trucks moving heavy carts from central receiving to team members on the line, AMRs help lower the level of fork truck traffic in main aisles where team members walk. The reduction in fork truck traffic not only reduces the amount of crowding in the plants but can also improve safety by reducing the instances where fork trucks share pedestrian aisles.

- **Helps improve safety and the team member experience.** AMRs are used in areas where heavy carts may reach up to 900 pounds (408 kg). Not only are they saving team members from having to push those heavy loads, but they also free up material handlers to do value-added work like picking parts instead of pushing carts.

- **Agility.** These new models of AMRs allow for in-house programming. This means we can be agile as line layouts and needs change. It's simple to remap for the facility they serve and even to move them to different plants as seasonal needs change.

On the next generation of AMRs, Manufacturing Engineer Justin Van Soelen said, "We’re really excited for the flexibility of these. We’ve had to wait on programming and changes in the past. The fact that these new units will allow us to be very nimble in terms of how we serve the needs of team members has us very excited!"

These new AMRs will hit the floor in early 2021 as Plant 7 moves are complete and the new facility is mapped out for the robots.
What can we do in Jasper County?

Economic Developers doing Business Retention & Expansion (BRE) will Transform...

From Interviewer to Investigator

Your Key Action Items

1. Have a learning strategy – identify courses, magazines, webinars, media channels, events, key people (business leaders, academic experts) etc. to be a student of best practices

2. Educate yourself on the terms and jargon. Whenever possible try to see these emerging technologies ‘in action’ and talk to those businesses involved for their insights.
3. Keep abreast of technology that you can use in the EDO. EDOs can demo proactivity (e.g. drones, geofencing)

4. Challenge your community to discuss the future – examine possible future scenarios through dedicated staff, events, advisory groups and research reports.

5. Realize as communities grapple with more complex issues, economic developers will likely need to expand beyond traditional economic development activities.

6. Understand & anticipate your businesses’ needs, challenges & opportunities

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**The Basics**

- Educate your companies.
- Provide manufacturing career awareness and guidance to students, parents and educators.
- Connect manufacturers to technical assistance.
- Work to expand access to high-speed internet.
Direct to your Businesses...

- Sharing of available technical assistance resources from various service providers
  - **Public Institutions**
    - Students – projects, internships, apprenticeships
    - Faculty/staff
    - Programs
    - Equipment
  - **Private**
  - State/Regional funding support of R&D, innovation investments

CIRAS

**Industry 4.0 services:**
- Education on technologies
- Opportunity Identification
- Assessments/Evaluation
- Demonstrations
- Proof of Concept Development
- Technology Provider Connections
- Implementation Assistance
- Webinars on Demand
- Technology Videos

https://www.ciras.iastate.edu/industry4-0/
Keeping up with Trends

• Where to get information:
  • Trustbelt Conference
  • FABTECH
  • Industrial Exchange
  • Integr8 Conference
  • 3DExperience World Conference
  • MxD (Manufacturing times Digital)
  • Manufacturing Tomorrow
  • Connected Manufacturing Forum
  • Iowa Association of Business & Industry
  • Industry 4.0 Facebook Page

Manufacturing 4.0

• Manufacturing 4.0 Consortium
  • Iowa’ Community Colleges
  • CIRAS
  • Association of Business and Industry
  • Iowa Department of Education
  • Iowa Economic Development Authority
  • Iowa Workforce Development
  • Professional Developers of Iowa
  • Institute for Decision-Making, University of Northern Iowa

This unique collaboration will implement an education, awareness strategy statewide and that will lead to development of curriculum to meet training needs of manufacturing businesses throughout Iowa.
Manufacturing 4.0

• Manufacturing 4.0 Plan:
  • Manufacturing 4.0 Tech Adoption and Utilization
  • Enabling Infrastructure for Digital Technologies
  • Improving Supply Chain Linkages
  • Accelerating Manufacturing Startups and Scale-Ups
  • Ensuring an Effectively Trained Manufacturing 4.0 Workforce

• Proposed legislation:
  • Adapt Iowa’s incentive structure, including matching grants
  • Accelerated depreciation for M4.0 capital investments as part of qualifying HQJ projects
  • Signed! Broadband bill (Empower Rural Iowa broadband grant fund)

Industry 4.0 Thank You for Your Work!
Are you & your businesses ready?

University of Northern Iowa
Business & Community Services

EDA U.S. Economic Development Administration