The Impact of Additive Manufacturing on the Nation's Future Workforce

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Conversation for Today

• How did we get here?
• Why is 3D Printing important?
• What is the impact on workforce?
• Why is it important to cities?
• What can cities do?
How did we get here?

US Conference of Mayors
US Manufacturing Innovation Fund Award
2014

Workforce Creation in 3D Printing
University of Louisville
2018
Additive Manufacturing (AM / 3D Printing)

The process of joining materials to make objects from **3D model data**, usually layer upon layer.

- **Polymers**
- **Metals**

**Fused Filament Fabrication**

**Powder Bed Fusion**
Why is 3D Printing important?

- New designs
- Faster project times
- Reduced project costs
- Major industries impacted
- US construction: $1.2 Trillion
- Employment: 1.5 million
- Median age: 43 years
What is the impact on workforce?
Murakami Corporation
CEO – Taro Murakami (5th Generation)
Founded 1882
Head Quarters Shizuoka, Japan
2,800 + Team Members

Murakami North America
CEO – Michael Rodenberg
Founded 2000
Locations: Kentucky, Mexico
550 + Team Members

1882
Decorative metallic parts and tin ware

1886
Lanterns and sheet glass for railroad construction

1897
Mirrors for Furniture Industry

1948
Murakami Kaimeido Inc.

1958
Expanded into Automotive
What We Make

1950's

Camera

CMS Camera Monitor

Side Turn Indicators

Blind Spot Detection

Power Fold

Today
Bridging the Employment Gap
“A New Mindset”
Maintain Your Team

The Building Blocks

1. Identify & Protect Mission Critical Positions
2. Develop Method to Evaluate & Compensate
3. Provide Clear Path for Growth
Traditional Recruiting is No More
Grow the Team......

Local Partnerships

Property of Murakami
Grow the Team......
Internships/Apprenticeships

Team Taylor County
Economic Development Authority
Our Team, Your Vision, Uncommon Opportunities.

August 2014

TRACK Pre-Apprenticeship Program’s First Year Deemed Successful as Plans to Expand Move Forward

The Tech Ready Apprentices for Careers in Kentucky (TRACK) program finished its pilot year with all of the student participants moving into full-time apprenticeships with their industry partners.

Office of Career and Technical Education (CTE) Business and Industry Specialist Mary Taylor created the program and said while numbers are small, a 100 percent success rate is indicative of the potential that exists within the program.

“As with any new program, the first year is a learning process as it was for TRACK. But to have all of our students who enrolled in the program advance into the full-time apprenticeships is a sign of things to come as we expand for the coming school year,” Taylor said.

Advanced Manufacturing was the only program area in which students participated during the pilot phase. The 2014-15 year will include the construction trades as well, and plans to expand beyond that are in the works, according to Taylor.

“I think the success of TRACK in its first year speaks well to a couple of points: one being the quality of construction students are enrolling in the machine tool technology program at Green County Area Technology Center (GCATC) and entered the pre-apprenticeship program working at Murakami Manufacturing, U.S.A., Inc. Having learned the necessary skills at the high school level made him an ideal candidate to
Grow the Team......
Collaboration/Alternative Programs/Scholarships
The Organization Leader’s Role
Bridging the Employment Gap

Establish Goals
Provide the Tools for Success
Get out of the Way

Let the Horses Run

Objective Analysis

Brutal Truth
Know Your Culture
Know Your Team

Identify Real Needs
Establish Partners
The Power of “One By One”

Prepare for the Future

Build the Foundation

Clear Vision
Mission Critical
Grow from Within
Superior Maintenance Co.

• Headquartered in Elizabethtown, KY
• Serving Toyota, Mercedes-Benz, Akebono, Bridgestone
• Core business: Facilities Management, Manufacturing Support
• Grew from 1 to 1000+ employees over 30 years
• Increasing earnings and sales: 30 consecutive years
Focus on Excellence

- Established manufacturing facility in West Louisville in 2018
- Ernst & Young Entrepreneur of the Year Award in 2013
- “Toyota Supplier Award for Outstanding Cost Performance in 2012
- National Minority Supplier Development Council MBE Supplier of the Year in 2005 and 2011
- Kentucky Workforce Investment Board in 2009
Urban Population Trends

• FACT:
  • In 50 largest U.S. cities, traditional minorities are now the majority.

• FACT:
  • The population of 25 largest cities will grow by 75% in the next years.

• FACT:
  • Inner city neighborhoods are growing at 7x the rate of the nation.

Source*: U.S. Census Bureau
Source**: Fannie Mae Study/Canyon-Johnson Urban Fund
Our Workforce Development Strategy

Catalyst Project:
Louisville Additive Manufacturing Business Development Alliance (LAMDA)

Workforce Development → Project Completed with Local Participants → Economic Development
Implementing the Strategy in West Louisville: LAMBDA

- Workforce Training
- Business Incubator
- Entrepreneurship Training
- Community Partnerships
- Professional Network
Connecting 3D Printing to Automotive

- **US automotive:** $1.5 trillion
- **Opportunity:** Service parts
Connecting 3D Printing to Healthcare

- US healthcare: $7 trillion
- Employment: 7.3 million
Connecting 3D Printing to Aerospace & Defense

- Rolls-Royce
- GE
- Pratt & Whitney

- US aerospace: $1 trillion
- Employment: 2.4 million
A Case Study

GE Engine Bracket: Old & New

Arie Kurniawan, Phillipines

"At GE, we know innovation can come from anywhere... to unleash new solutions to tomorrow's challenges using additive manufacturing."

Steve Liguori, GE Executive Director of Global Innovation
What can cities do?

• If a twenty-something with no industrial manufacturing experience could out-design a leading multinational company with top-flight engineers, what are the implications for the current workforce?

• If this critical part could be redesigned with such massive improvements, what are the possibilities for tens of millions of parts?

• If this new technology allowed manufacturing to be cost-effectively re-shored to the US, what could this mean for cities?
The Presenters

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