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Responses to NIST MEP Request for Information on Identification of New Capabilities Needed By the Hollings Manufacturing Extension (MEP) Program (issued 12/14/2016)
Prepared and Submitted By *InnovateMEP Mississippi* (The MEP of Mississippi)
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1. Critical Manufacturing Technologies

What advanced manufacturing technologies are/will be needed by small U.S. manufacturers for the companies to be competitive and grow in the global marketplace in the near-term (1-2 years), mid-term (3-5 years) and/or long-term (>5 years)?

a. *What would be the appropriate Manufacturing Readiness Level or Technology Readiness Level for those technologies in order for small U.S. manufacturers to consider adoption?*
b. *What information will be required for small U.S. manufacturers to understand a technology or related group of technologies and the risks and opportunities associated with making or not making an investment in any given technology?*
c. *How is the information about advanced manufacturing technologies best delivered to small U.S. manufacturers and/or MEP Centers that support those small U.S. manufacturers?*

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- Being geographically located where the Shipbuilding Industry is prevalent, technologies for shipbuilding trades i.e., ship-fitting, outside/inside machinist, pipe-fitting, welding, etc., are needed.
- In addition, working also with energy generating companies, the need for technologies required for operations and maintenance staff is of great importance. These technologies are vital to the continued success and future growth of manufacturing in our area.
- Thermography – to assist with preventative and predictive equipment maintenance
- Computer Aided Drafting - CAD – large automotive OEM is rolling out new body style for a new model and automotive supplier and the OEM expressed need for CAD to help with new plant equipment layout and design (currently working on customized curriculum with company).
- Design of Experiments (DOE) – resulting from companies' need to be able to make better decisions about changes in the production process.
- Develop 9-day advanced manufacturing curriculum for automotive supplier pilot program to help meet the needs brought about with the change in body style of automobile to retrain employees for new equipment and process modifications to take place within the automotive supplier company.

- Statistical Process Control (SPC)
- Simulation Modeling Supporting Advanced Planning for Model Changes.
    - Technology Assistance Practices
- Methodology for Assessing Manufacturability of Product Designs
    - Pilot Case Studies
- Manage / coordinate technology assistance projects across the university for the two large automotive OEMs based in Mississippi.
- A jet engine component manufacturer [a joint venture] identified "total automation" (including robotics) as a critical manufacturing technology.
- An airplane component manufacturer identified automation and tooling support as critical manufacturing technologies with which they need assistance.
- A large automotive OEM identified robotics, PLC, and automation as critical manufacturing technologies. Other key areas such as rapid prototyping / additive manufacturing, materials development, process development were also noted.

2. Supply Chain Requirements

What technologies and/or business models are important to small U.S. manufacturers as they choose and participate in any particular supply chain?

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- For production and distribution of manufactured commodities, extensive safety training, lean manufacturing, six-sigma, logistics and shipping expertise is critical.
- Certifications (for example large automotive OEM) requires trainer to have certification in ISO.
- Business Management System (BMS) – industry's need to make faster and more effective decisions in growing their businesses.
- New Training offerings focused on needs within Supply chain:
    - Offerings in Problem Solving through a collaboration with Univ. of TN's CIS … P-FMEA, 8D, Firewall, Capacity Planning.
- Other Soft Skills courses need to be developed and piloted: Facilitation, Team Skills, and "Leading Change."
- Simulation Modeling Supporting Production Line Design
- Advanced Planning for Supporting Vehicle Model Changes For Suppliers
- A jet engine component manufacturer (joint venture) identified workforce as their largest key supply chain concern.

3. Potential Business Services, Including Information Services;

What complementary business services, including information services, are and/or will be needed by small U.S. manufacturers and/or MEP Centers to take full advantage of advanced manufacturing technologies at the company or supply chain level?

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- Various computer software training and specialized computer software implementations for office management and support staff as well as employee

development training is a fundamental need identified among all of our serviced industries.

- Leadership classes – more companies are asking for leadership training –
  - Need to improve leadership abilities to improve communication and working relationships between leaders and crew members
- ISO (internal auditor)
- DDI Leadership Classes.
- Computer Classes for advanced manufacturing employees (Microsoft Excel, Access, PowerPoint).
- Hands On Electrical and Mechanical Maintenance Assessments for Employees in order to maintain position and/or advancement in company
- MSBC (Manufacturing Skills Basic Certification) - Automotive supplier using to help screen in hiring and additional training used for employee advancement within the company.
- Enhanced Maintenance Practices for Asset Management (i.e., Maintenance and Reliability Engineering):
  - We have initiated several new courses and partnerships supporting this overall objective.
  - New Training Offerings in Solid Modeling, GD&T.

4. Other Technologies or Services That Would Enhance Global Competition

5. *Are there any other critical issues that NIST MEP should consider in its strategic planning for future investments that are not covered by the first four questions?*

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- ISO 9000 and 3D printing and automation/robotics applications will help enhance our areas global competitiveness.
- ISO Auditor Training.
- SAP – software used to help companies to be more cost effective.
- Minitab – software used with Six Sigma.
- Furniture Industry in need of training for sewing machine operators – many of those jobs were outsourced and are now being performed in the US and the workforce of skilled sewing machine operators is not available.
- Emerging Technology for Supporting Plant Master Planning.
- Use of Facility Scanning Technology to create virtual representation – use in "as is" condition and the ultimate integration of objects from solid modeling to support the "to be" condition.
- A manufacturer of hydrocarbon, rosin based and specialty resins tells us that they must seek process efficiency improvements to continue to compete with international competition.