

# Manufacturing Extension

## An International Perspective



Evaluating the Implications of the MIT  
Final Report on Advanced Manufacturing  
Washington, DC  
November 1, 2013

Luis M. Proenza  
University of Akron

# The MIT Report: A Wake Up Call

- **Manufacturing Matters:** From this morning's presentations, we know that Manufacturing Matters for Innovation, Growth, Employment, and National Security
- **Key Message :** Decades of corporate restructuring, outsourcing, and overseas manufacturing have eroded the industrial capacity needed to turn the nation's innovations into products — and jobs.

# Competitiveness and the Manufacturing Challenge

- The rest of the world already knows that Manufacturing Matters
- Our leading competitors have established substantial programs to support manufacturing and innovation.

# Countries of the World that think Manufacturing doesn't matter



P.S. The Government of Great Britain is changing its mind

# Newly Released Academy Study Reviews MEP & Foreign Programs to Support Manufacturing

21<sup>st</sup> Century Manufacturing: The Role of the  
Manufacturing Extension Partnership Program

NB: See the Report for Findings & Recommendations

# A Rigorous Review Based on Multiple Sources

- An informed committee chaired by Philip Shapira of Georgia Tech
- Five NRC workshops
- Interviews, data analysis, literature review
- Site visits and/or consultations with MEP Centers
  - Georgia: GA-Tech; Ohio: MAGNET; Pennsylvania: DVIRC and Catalyst; Indiana: Purdue; California: CMTC; Minnesota: Enterprise Minnesota; Alabama: Alabama Technology Network; MEP of Mississippi, Tennessee MEP; North Carolina MEP
- **Onsite visits to foreign manufacturing programs in Canada, Germany, Taiwan, UK, and France**

# Key Questions Guiding the Study

- How can we improve MEP to address today's manufacturing challenge?
- What are leading countries doing to support on-shore innovation and manufacturing?
- What can MEP and other manufacturing programs learn from global best practices?

# Why Review Foreign Programs?

- Insights drawn from programs with similar components can be relevant.
  - The importance of a comparative perspective
- MEP's mission now includes promotion of innovation in manufacturing by SMEs
  - Best practices used by leading foreign programs to foster innovation can provide valuable lessons.
- MEP is seeking to improve the efficiency of its services.
  - Leading foreign programs like Fraunhofer and ITRI have provided similar services and MEP can learn from their experiences.

# What are some of the Key Features of Foreign Programs?

# Canada's Industrial Research Assistance Program (IRAP)

- **Brand:** Canada's premier innovation assistance program for SMEs
- **Reach:** Supports over 8,500 SME's across Canada to develop and commercialize their technologies
- **Network:** More than 200 field staff located in over 130 offices across Canada
- **Services:** Comprehensive suite of locally-delivered advisory services.
- **Budget:** Federal support for IRAP roughly doubled in 2012 from \$128 to \$220 M: 2 x MEP in an economy 10 times as small

# The German Fraunhofer Institutes

- **Broad Network:** Stable and well-organized system of over 60 research institutes covering major areas of basic & applied research
- **Scale:** Over 22,000 employees, many with advanced degrees
- **Partnership:** Each institute paired with a university
- **Competition:** Institutes compete, but also network effectively
- **Budget:** Sustained and substantial investment
  - \$2.45 Billion budget with 1/3 state; 1/3 federal and 1/3 private contributions
  - In effect, approx. 80% of budget is from public sources

# Taiwan's Industrial Technology Research Institute (ITRI)

- **Strong Brand:** Transformed Taiwan's economy with its focus on applied research and technical services for existing firms
- **Strategy** fosters the creation of entire industry chains supporting the manufacturing process
  - From design, materials, equipment, testing, packaging, quality control, and applications
- **Budget** of \$600 million/year; half from the government
- **Close Links** to Taiwan's universities to turn research into new products and manufacturing processes.

# France's Carnot Program

- Competitively awarded seal of excellence for public research organizations.
  - Continued participation of centers based on periodic evaluation of cooperation with industry
- 34 Carnot Institutes, distributed across France :
  - Engage in basic as well as applied research
  - Employ 25,000 researchers
  - Annual Budget of \$2.6 Billion (2011)
  - 7800 direct annual research contracts with companies
  - Revenues of ~ \$480 million
  - About half of the institutes research is financed by private companies; \$82 million for SMEs.

# What can we learn from Foreign Manf. Programs?

## Best Practices Include:

- Substantial and sustained funding
- Long-term focus on manufacturing
- Well equipped facilities and Highly trained staff
- Training of Graduate and Undergraduate students in a hands-on environment; co-located with universities
- These foreign programs offer customized and flexible field services directly to firms
  - information, diagnostics, mentoring, technology support, prototyping, demonstration, networking, and referral and expert personnel

# Best Practices from Foreign Programs

- **Substantial Autonomy** in establishing strategies and deploying resources but with long-term accountability
- **Links to local clusters**, including partnerships with universities and long-term collaboration with private firms
- **Support for start-ups**: Space; equipment; legal, IP and technical assistance; management advice and business connections for funding and markets
- **Regular assessment**, learning, program adaptation, shifts in priorities over time

Can we apply these lessons at  
home?

The Academy's Study of the  
Manufacturing Extension Partnership  
(MEP) suggests we can.

# MEP's Unique Role

- Leading US program designed explicitly to provide support services to small and medium manufacturers
  - These SMEs have limited market alternatives
  - MEP reaches out to some 7000 SMEs a year
  - Distributed program, with some 60 Centers addressing needs particular to different regions
- MEP is a key element in NIST's support for U.S. based manufacturing

# MEP: An Effective Program

- **The Program Works:** The MEP program makes effective use of relatively limited resources for reaching and supporting small and medium sized manufacturers.
- **Focus on Lean:** MEP's introduction of lean manufacturing techniques to small manufacturers has been valuable.
- **The New Innovation-Focused Strategy is sound:**
  - A concerted effort to encourage MEP Centers to develop a wider range of services focused on innovation and growth.

# What can MEP do better?

- **Improve learning across the MEP System:** Substantially expand sharing and use of best practices across its Centers
- **Develop positive incentives** for MEP Centers to improve the delivery of their services.
- **Draw on Global Best Practices:** MEP needs to better understand the operations and impact of leading foreign programs and draw on their best practices lessons.
- **To do these things, MEP funding needs to increase.**

# What can we learn from Global Best Practices?

- **Stable Funding:** More, and more stable public funding is needed to encourage flexibility, better management and support new initiatives.
- **Linkages:** Establish closer ties to universities and draw in expertise from university researchers.
- **Training:** Provide hands-on training for students
- **Above all, focus:** **Long-term, sustained policy focus on manufacturing is necessary in a competitive world.**

## To Conclude...

We need to pay attention to what  
the rest of the world is doing.

# Long-term, sustained policy focus on manufacturing is necessary in a competitive world

The rest of the world is investing in  
manufacturing.

Without such support, innovative new local  
firms will migrate to other regions



Thank You

Dr. Luis M. Proenza  
President of The University of Akron