Future of the MEP Centers
MEP Advisory Board Perspective

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MEP National Advisory Board

Contents

- The present – as the Board sees it
- The future – higher needs and aspirations

MEP National Advisory Board

PUBLIC LAW 110–69—AUG. 9, 2007 "America Competes 2007"

MEMBERSHIP—The MEP Advisory Board shall consist of 10 members broadly representative of stakeholders

MEETINGS—The MEP Advisory Board shall meet not less than 2 times annually, and provide to the Director—

- ''(A) advice on Manufacturing Extension Partnership programs, plans, and policies;
- ''(B) assessments of the soundness of Manufacturing Extension Partnership plans and strategies; and
- ''(C) assessments of current performance against Manufacturing Extension Partnership program plans.

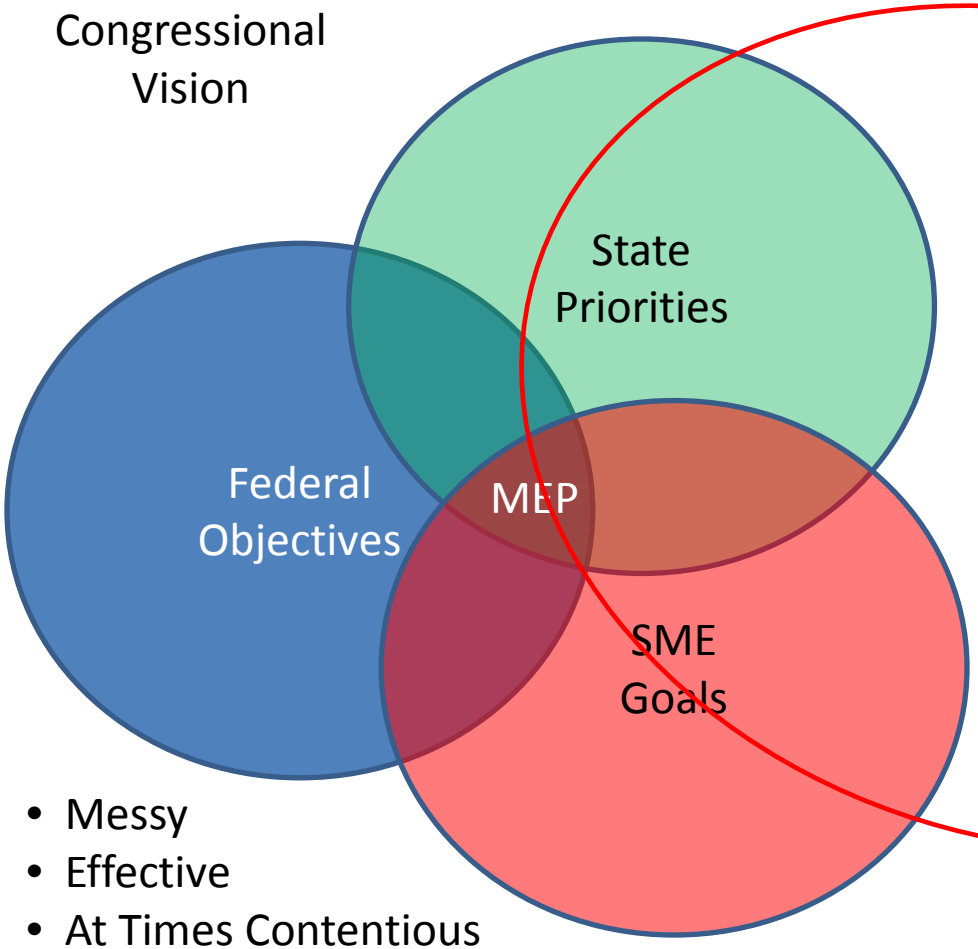
REPORT—The MEP Advisory Board shall transmit an annual report to the Secretary for transmittal to Congress within 30 days after the submission to Congress of the President's annual budget request in each year. Such report shall address the status of the program established pursuant to this section and comment on the relevant sections of the programmatic planning document and updates thereto transmitted to Congress by the Director under subsections (c) and (d) of section 23.''.

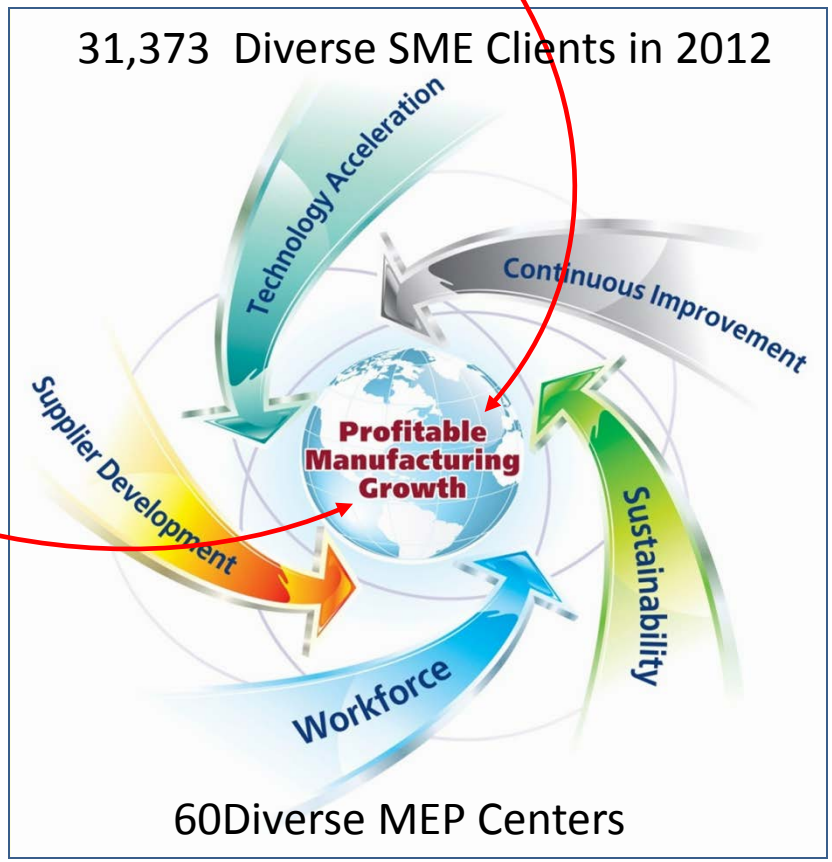
MEP P^3 Intricacies

Congressional Vision

MEP Implementation

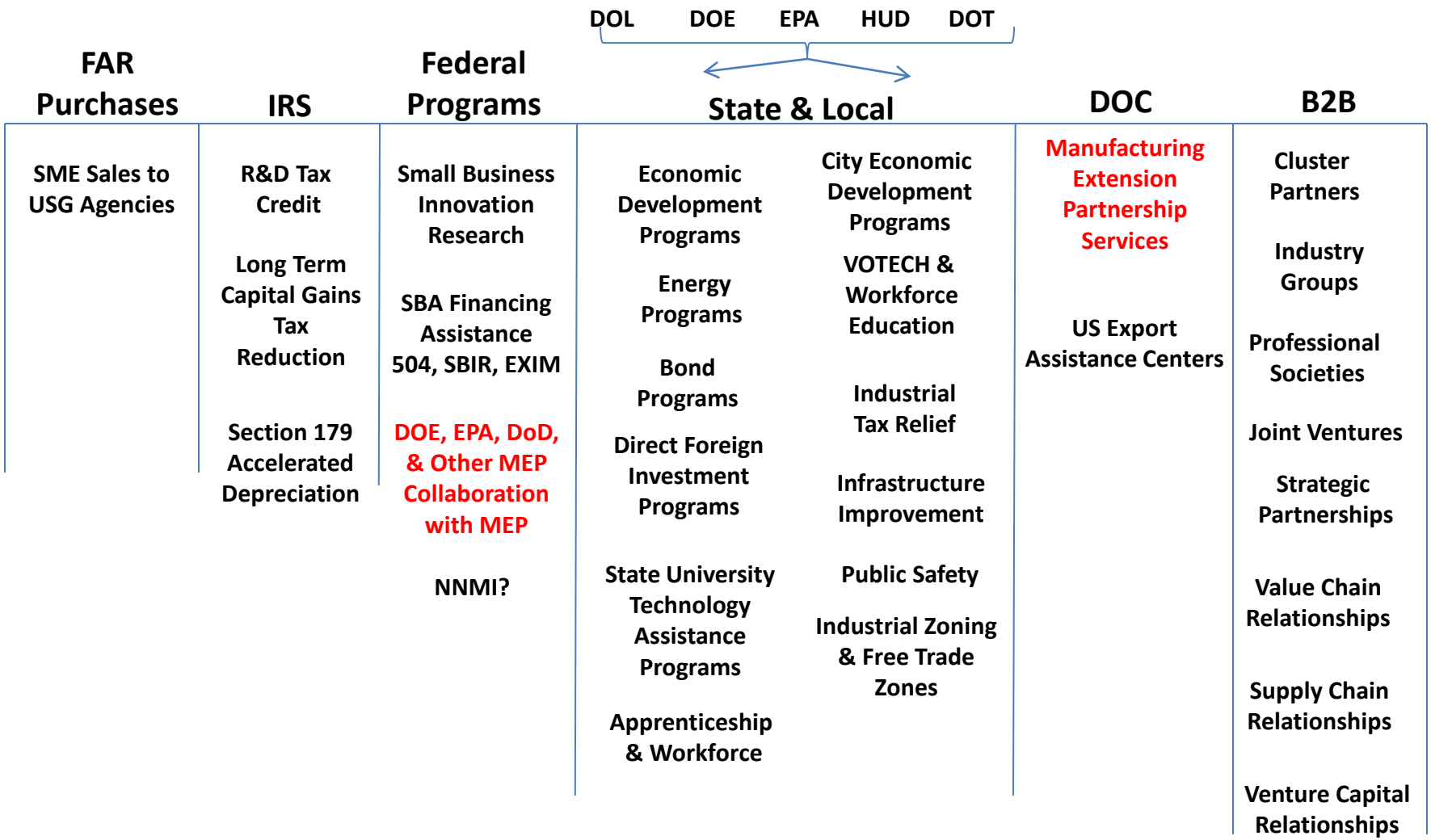
Shared Costs





- Messy
- Effective
- At Times Contentious
- Negotiated not Mandated
- Extremely Responsive
- Tangential Benefits are Frequent
- Comprehension of Benefit is Dispersed

SME Catalysts



Government Proscribed ⟷ Company Formulated

Recommendations from a Recent Board Meeting

- Funding
  - Broaden MEP public-private partnership - but keep the cost share requirement
  - Expand MEP Center business models - financial stability/growth
  - More technology “broker” capability in and through Centers

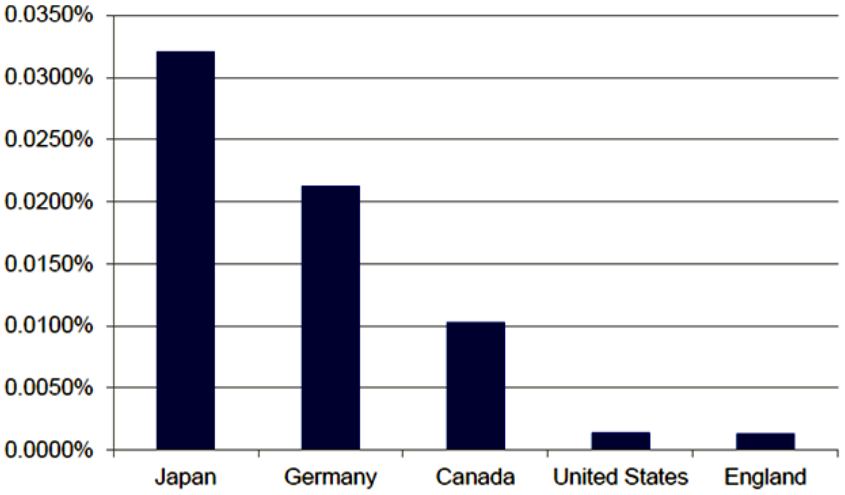
- Management
  - Exchange programs for Federal and Center staffs
  - Center Operations Reporting Evaluation (CORE) focus on the overall strategy achievement not on the measures themselves
  - Regular open competitive awards for center operation
  - Promote local Board functions
  - More ROI analysis on MEP’s growth programs
  - Avoid programs that lack State and Manufacturer cost share

Recommendations from a Recent Board Meeting

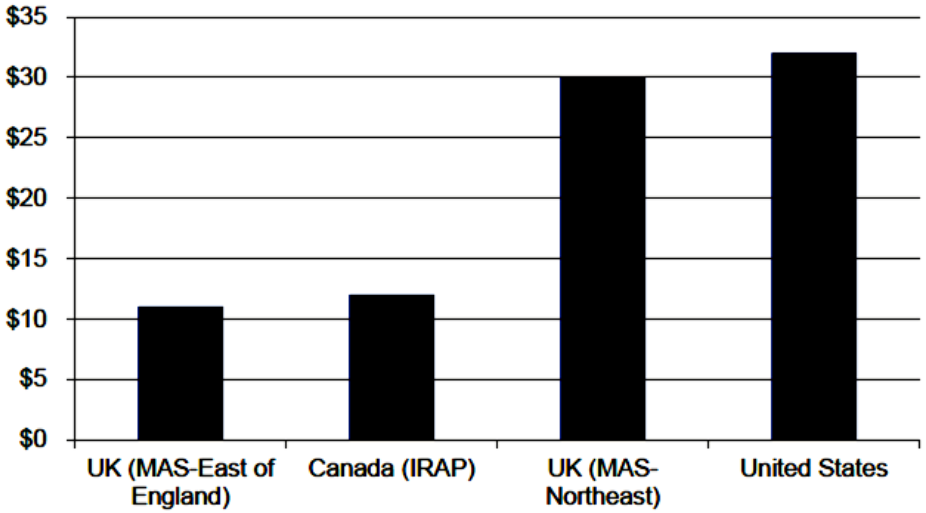
- Workforce development
  - Needs more attention
  - Business model needed for Center participation

- National
  - As NIST considers new national initiatives, use the MEP system and existing centers of excellence rather than re-inventing the public-private infrastructure.
  - More small and mid-size manufacturer input need in NIST's plans & advanced manufacturing initiatives
  - Re-evaluate MEP's strategic plan with a focus the emerging national manufacturing strategy

International Benchmarking of MEP



Country Investment in Manufacturing Extension Programs as a Percentage of GDP



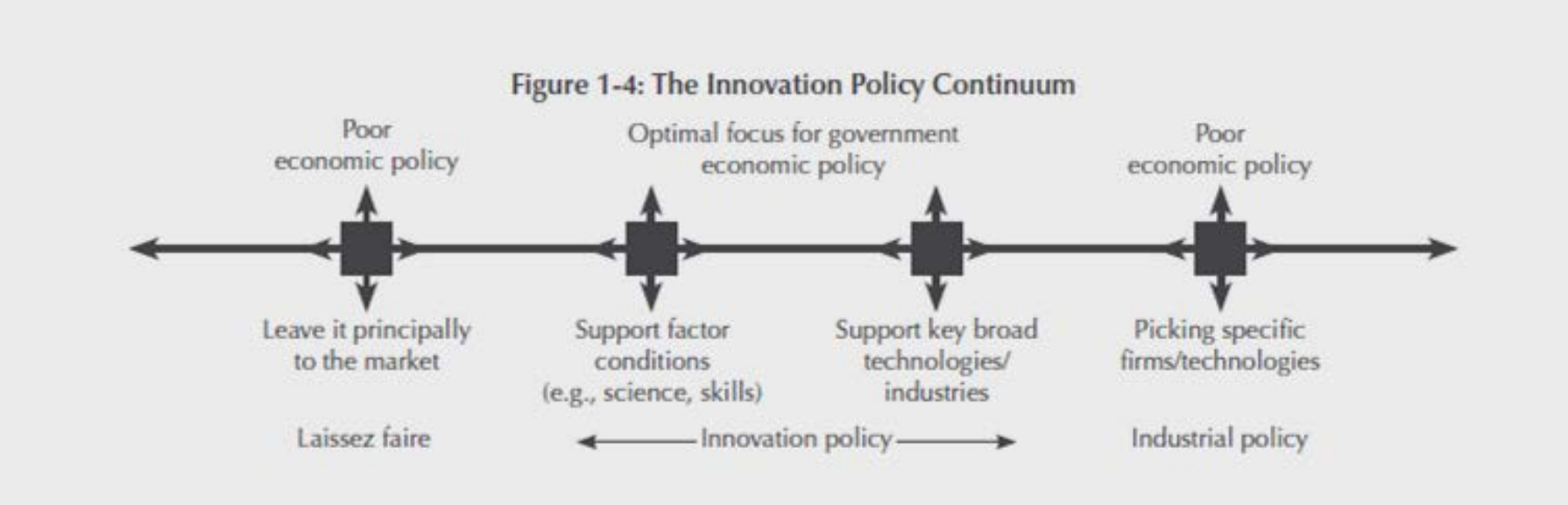
Return on $1 Investment in Manufacturing Extension Programs

http://www.itif.org/files/2011-sme-manufacturing-tech-programss-new.pdf

MEP as a Government-Industry Bridge

"The true choice in innovation is not between government and no government, but about the right type of government involvement in support of innovation. A modern, practical approach recognizes both the need for fundamental support and the hazards of overzealous government intervention. The government should make sure individuals and businesses have the tools and support to take risks and innovate, but should not dictate what risks they take."

http://www.whitehouse.gov/assets/documents/SEPT_20__Innovation_Whitepaper_FINAL.pdf



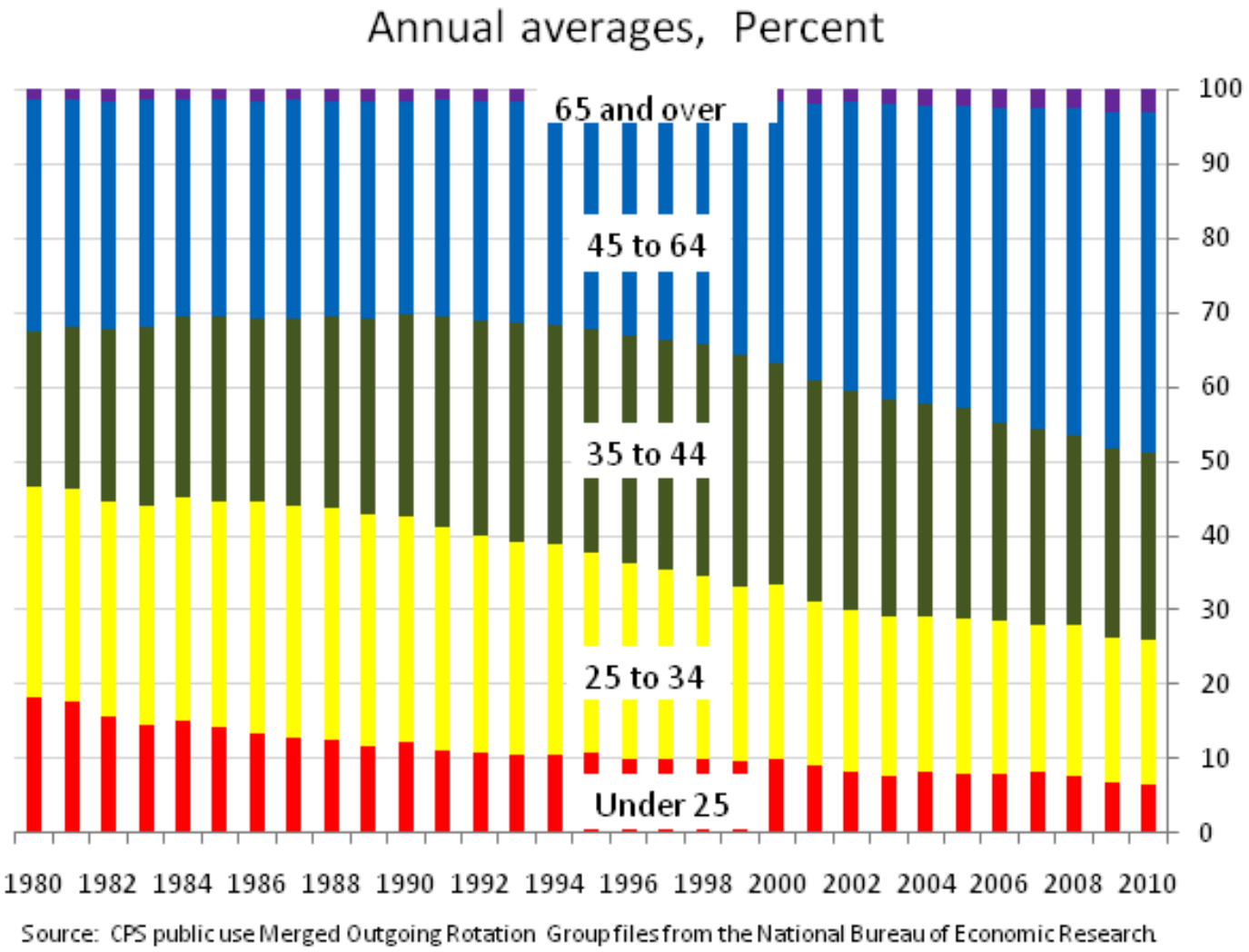
http://www2.itif.org/2012-global-innovation-policy-index.pdf

MEP Future
Address the Critical SME Problems

1. Aging workforce – inadequate labor pipeline
2. Balance of trade in goods – SME share of the fix
3. Technology “Valley of Death” for small companies
4. Value chain evolution and its impact on SMEs
5. Process automation – can SMEs afford to stay at the cutting edge?
6. Keeping pace with accelerated product lifecycles

1. Workforce

Manufacturing Employment by Age

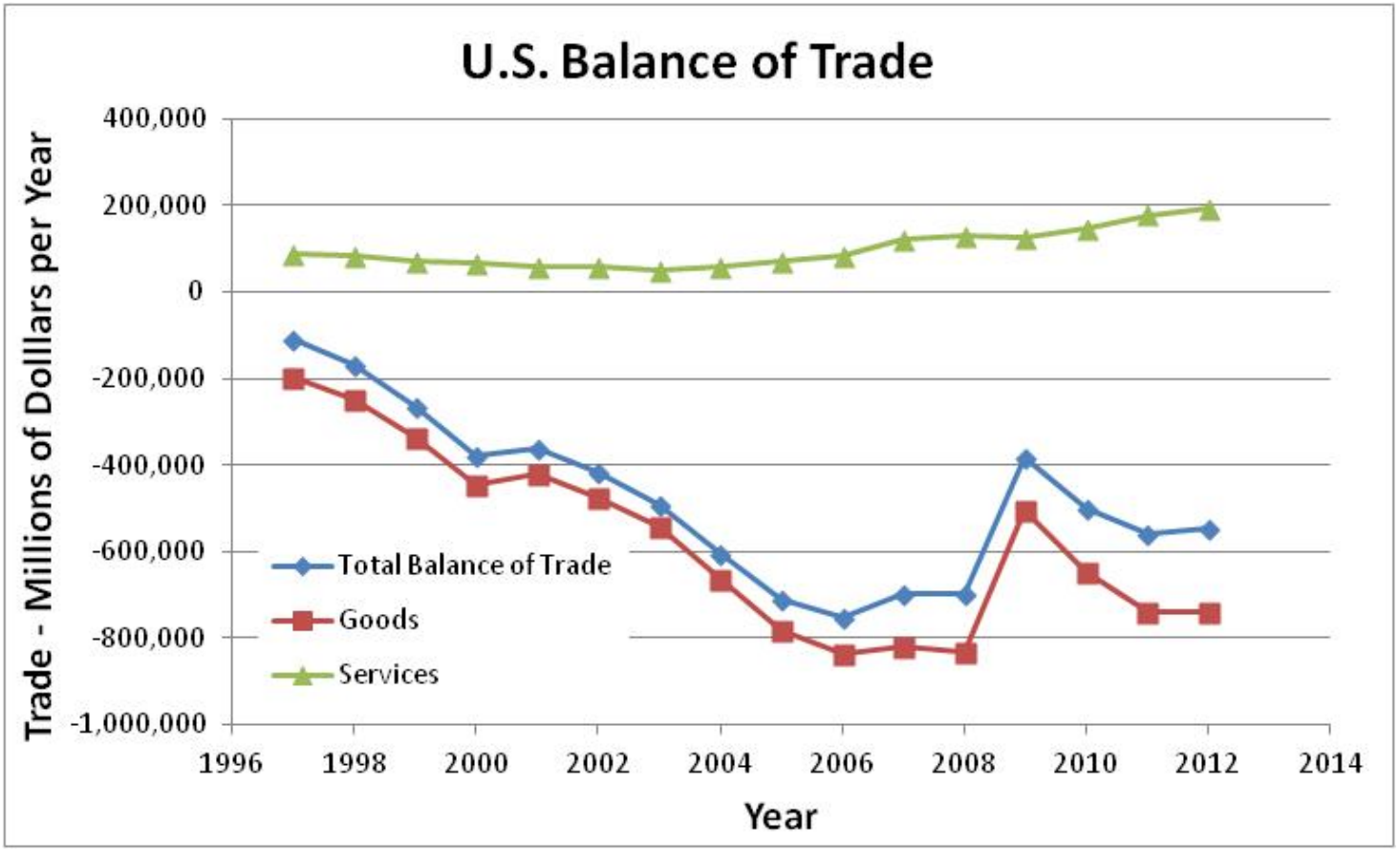


http://www.esa.doc.gov/Blog/2011/05/06/april-jobs-report-impact-education-and-age-manufacturing-employment

1. MEP Roles in the Manufacuturing Workforce

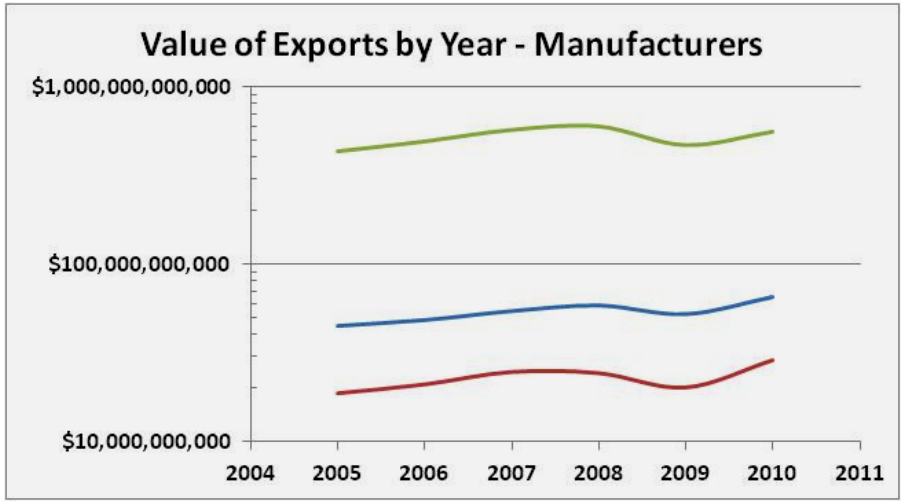
- Bridge the gaps between antiquated training programs and the needs of industry
  - Ripe area for public-private partnerships
  - DOL “career pathways” are the building block
- NIST uniquely qualified to translate emerging technology implications into training “standards” for nextgen manufacturers
- Collaborate with Federal agencies, States, and professional societies to reintroduce Manufacturing engineering curricula

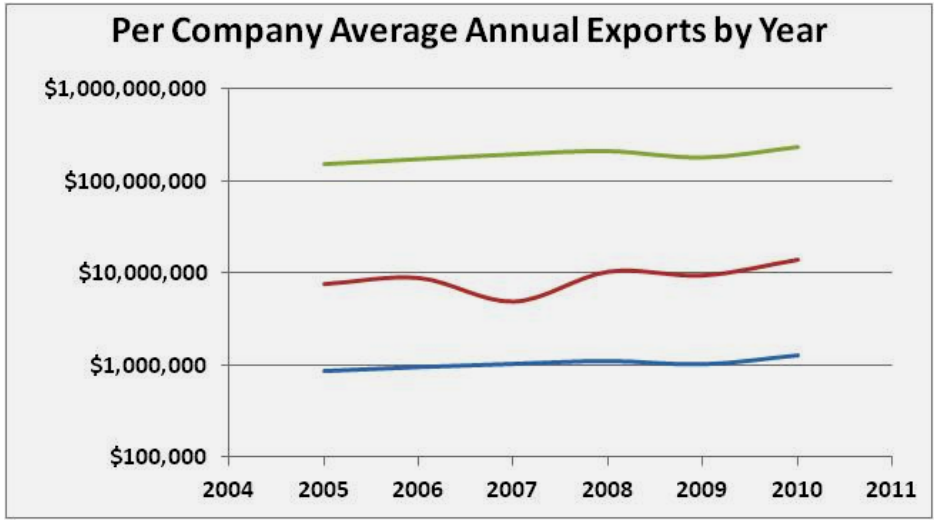
2. Exporting – Overall Situation

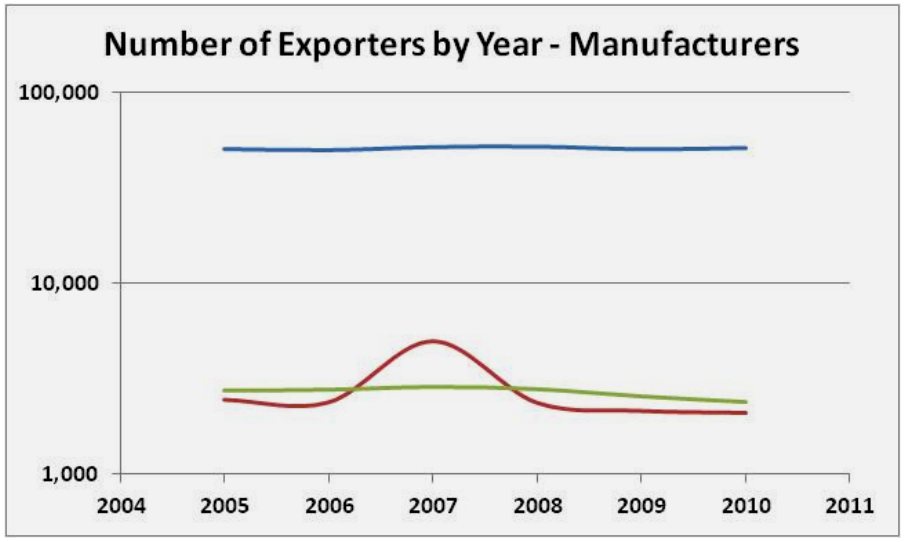


- 1992 – 2012 Trade Deficit in Goods of ~$10 Trillion
- 1992 – 2012 Net Trade Deficit of $8 Trillion
- 2012 Deficit in Goods of $740B (projected from Jan-Nov data)

2. Exports Are Important for MEP







U.S. has 50,000+ Small Exporting Manufacturers whose Exports Average $1M per year

2. MEP Exporting Initiatives

- ExporTech needs to expand
  - 3 day executive training
    - Why export – define your specific needs/problems
    - Address specific needs/problems
    - Executive develops product & region specific plan
    - Trade missions facilitated
  - High success rate – now in 25 states
- Need method to identify international opportunities and routinely communicate to SMEs
- Need a financial model that works for the Centers

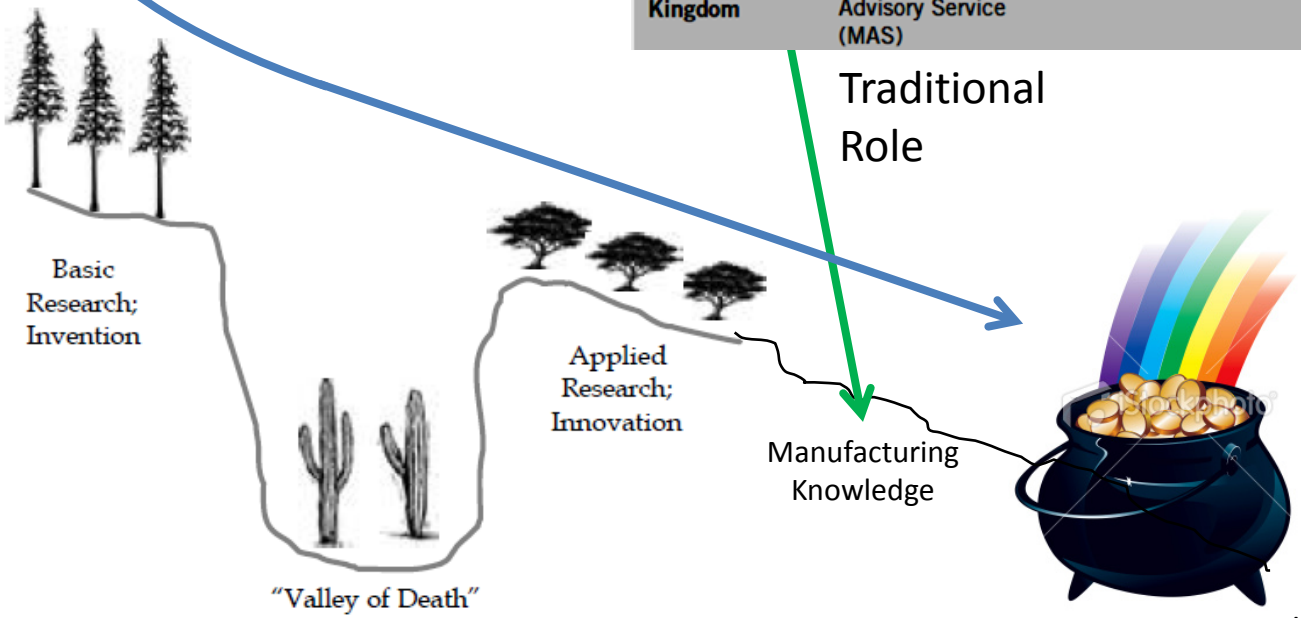
3. Manufacturing Extension Services and the Valley of Death

Country	Agency	# Centers/Regional Offices	Total Staff	Year Founded
United States	Manufacturing Extension Partnership (MEP)	60 State and Regional Centers	1,300+[1]	1988
Australia	Enterprise Connect	12 Centers	250	2008
Canada	Industrial Research Assistance Partnership (IRAP)	150 Offices in 90 Communities	220	1962
Germany	Fraunhofer Institutes	57 Fraunhofer Institutes	18,000	1949
Germany	Steinbeis Centers	750 Steinbeis Centers	4,600	1971
Japan	Public Industrial Technology Research Institutes (Kohsetsushi Centers)	262 Offices (182 Kohsetsushi Centers)	6,000+	1902
United Kingdom	Manufacturing Advisory Service (MAS)	9 Regional Centers	150	2002

Emerging Role ?

Traditional Role

Innovation Exports



U.S. Production Jobs, Investments, & Tax Revenue

3. MEP Roles in Bridging the Valley of Death

- P^3 role in connecting R&D rich institutions with organizations capable of transitioning R&D into production.
- MEP as a technology broker (beyond tech scouting)
  - Federal to private
  - Academic to private
  - Company to company
- Beyond innovation to execution

4. MEP and the Evolution of SME Value Chains

1910s-1970s

Vendor Relationships

- Frederick Winslow Taylor *"Principles of Scientific Management"*
- Henry Ford *"Design for Manufacture"*
- Kiichiro Toyoda *"Kaizen"*
- William Edwards Deming *"Plan-Do-Check-Act"*
- Genichi Taguchi *"Taguchi Methods"*

1980s

Supply Chain Relationships

- Senator Hollings - "Father" of MEP (1988)
- Focus on lean and quality
- MEP works lean and quality in the supply chain

1990s

Public Private Partnerships

- Shared public-private investment
- Reduce contractual constraints
- Aligned incentives

DARPA OTAs, Grand Challenge
Social & Business Networks
NIST MEP, DOT PPP, NMMI

E-Commerce

2010s

Value Chain Relationships

- Flexible contracting approaches
- Shared incentives for strategic cooperation
- Shaped by the growth of the Internet
- Rapid expansion of international business
- More competition & shorter product cycles

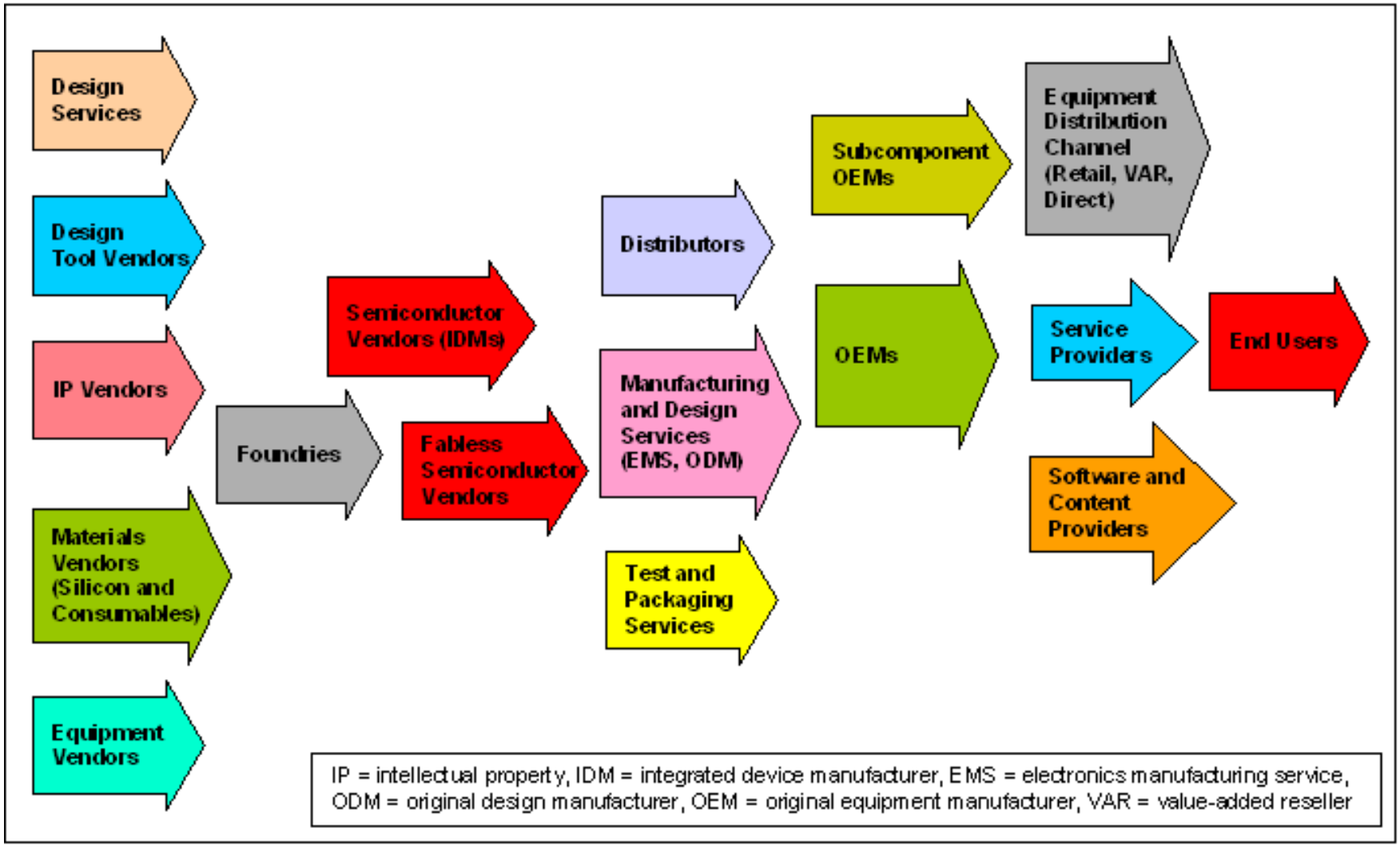
????

2040s

Next-Gen Relationships

NIST MEP Evolution

4. Semiconductor Value Chain Partners



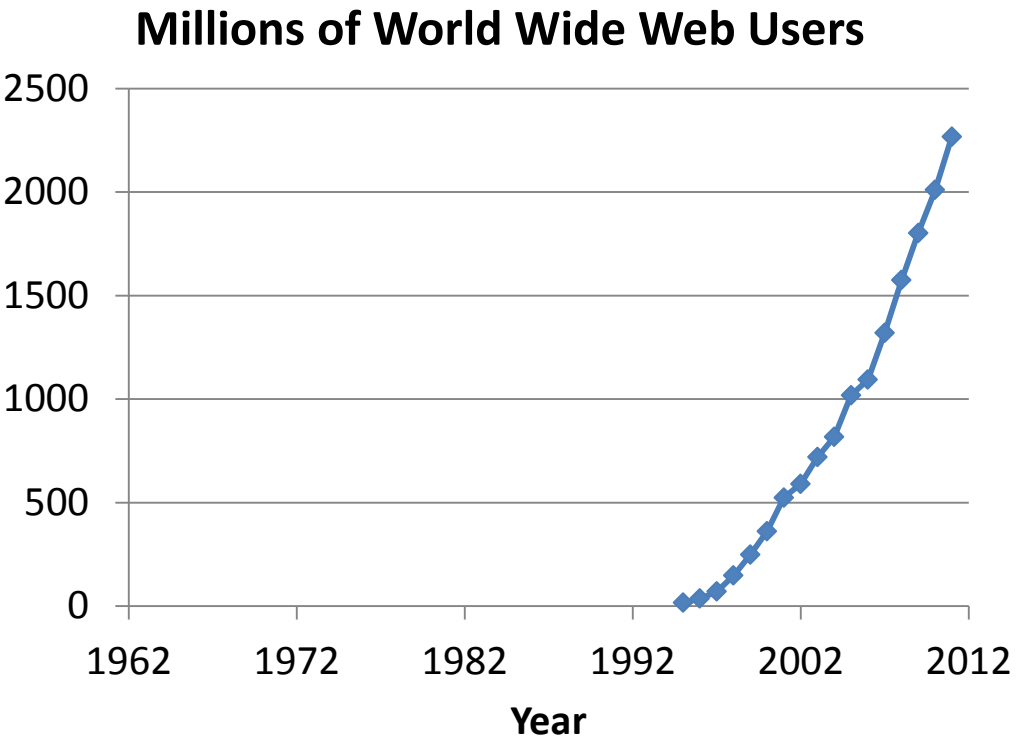
http://www.gartner.com/DisplayDocument?doc_cd=126802

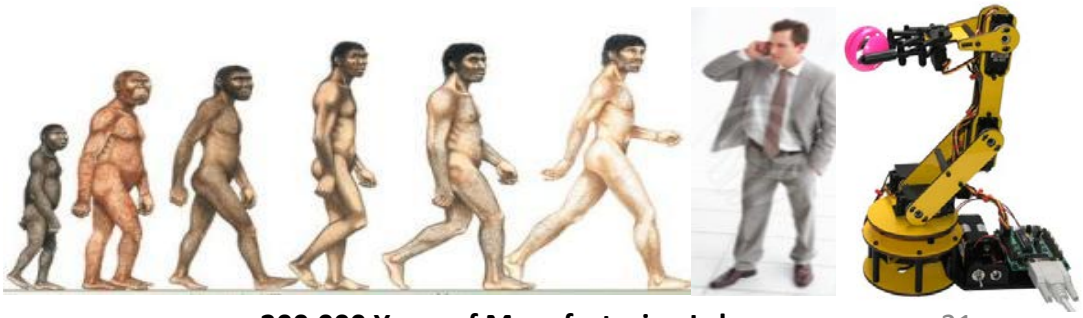
4. Value Chain Relationship Broker

- MEP connection between small and large businesses
- Broker for Innovation Impact Bonds (a la SIBs)
- Facilitating information exchange in the era of the semantic web

5. Manufacturing Process Evolution

- **1838 – Faraday uses Physical Vapor Deposition to make capacitors**
- **1950 – MIT Servo lab uses Punch Tape with a milling machine**
- **1952 – John Parsons Patent for CNC, patent number 2,820,187**
- **1957 – Ross and Pople at MIT g-code & APL Programming Language**
- **1961 – Integrated Circuit Patent Award**
- **1965 – DEC PDP-8 microcomputer**
- **1972 – HP 35 Pocket Calculator**
- **1975 – Microsoft Founded**
- **1976 – Cincinnati Milacron leads CNC Production**
- **1979 – German CNC production surpasses U.S.**
- **1980 – Japan CNC production surpasses Germany**
- **1982 – AutoCAD First Release**
- **1986 – Chuck Hull patents Sereolithography U.S. Patent 4,575,330**
- **1998 – Google Founded**
- **2003 – NIST EMC2 Open Source Code**
- **2007 – I Phone Introduced**
- **2009 – China Leads Machine Tool Production**
- **2010 - DARPA crowd sourced design experiments**
- **201? – Semantic web routine machine-to-machine disparate data transfers**





200,000 Years of Manufacturing Labor

5. MEP Future in Manufacturing Process Evolution

- Manufacturing process standards
- Technology awareness & infusion
- Avenue for government support of manufacturing technology insertion
- Advanced manufacturing training/infusion
  - Robotic processes
  - Additive manufacturing advances
  - Biomanufacturing
  - Nextgen technologies and methods

6. Accelerated Product Lifecycles

- Rapid product lifecyles
  - Financial implications for SMEs
  - Technology implications for SMEs
- What new mechanisms can be introduced to accelerate our transition of research into product
  - US policy changes to remain competitive
  - NMMI?
  - Innovation Impact Bonds ? (http://www.youtube.com/watch?v=E6GrQtCh83w)
  - Something else