

State of Manufacturing in the United States

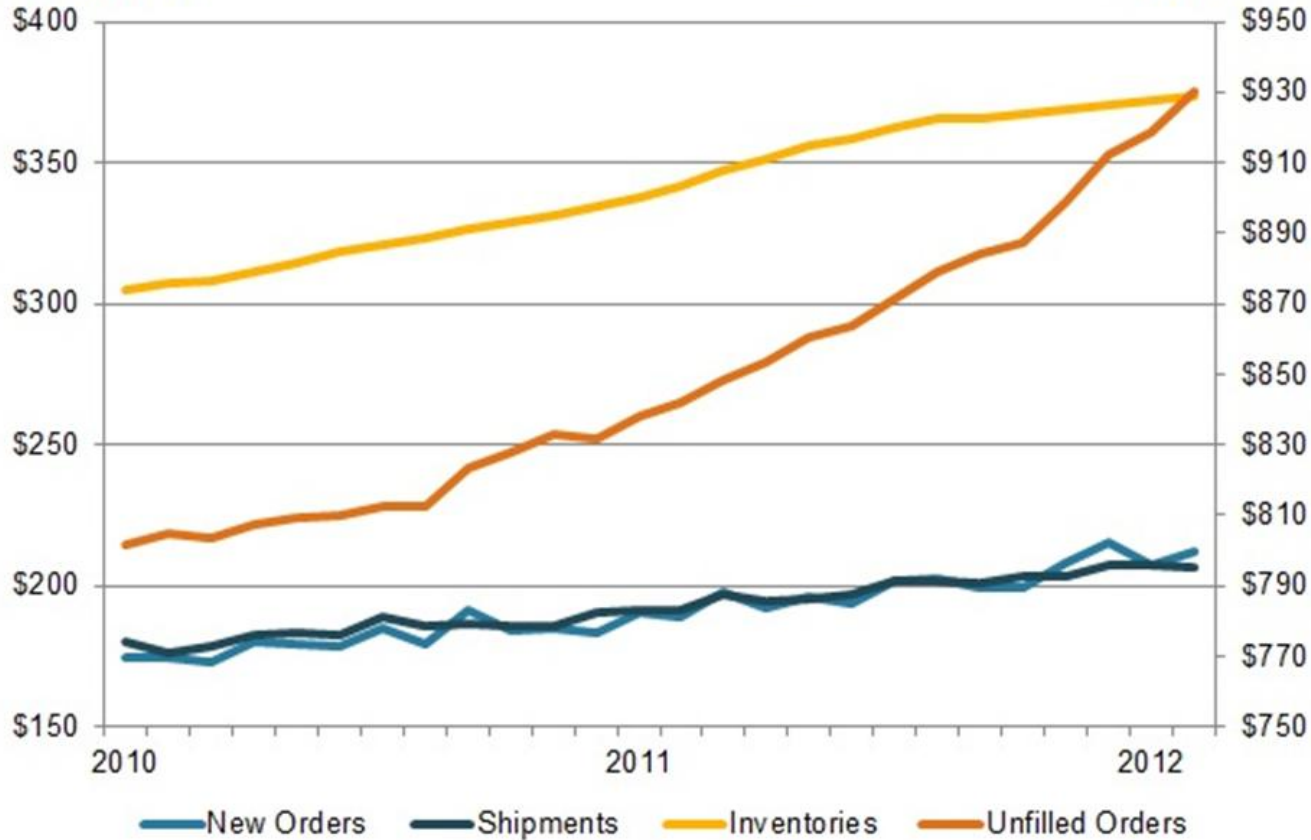
LaRoux K. Gillespie, Dr. Eng., FSME, CMfgE, PE
President,
Society of Manufacturing Engineers



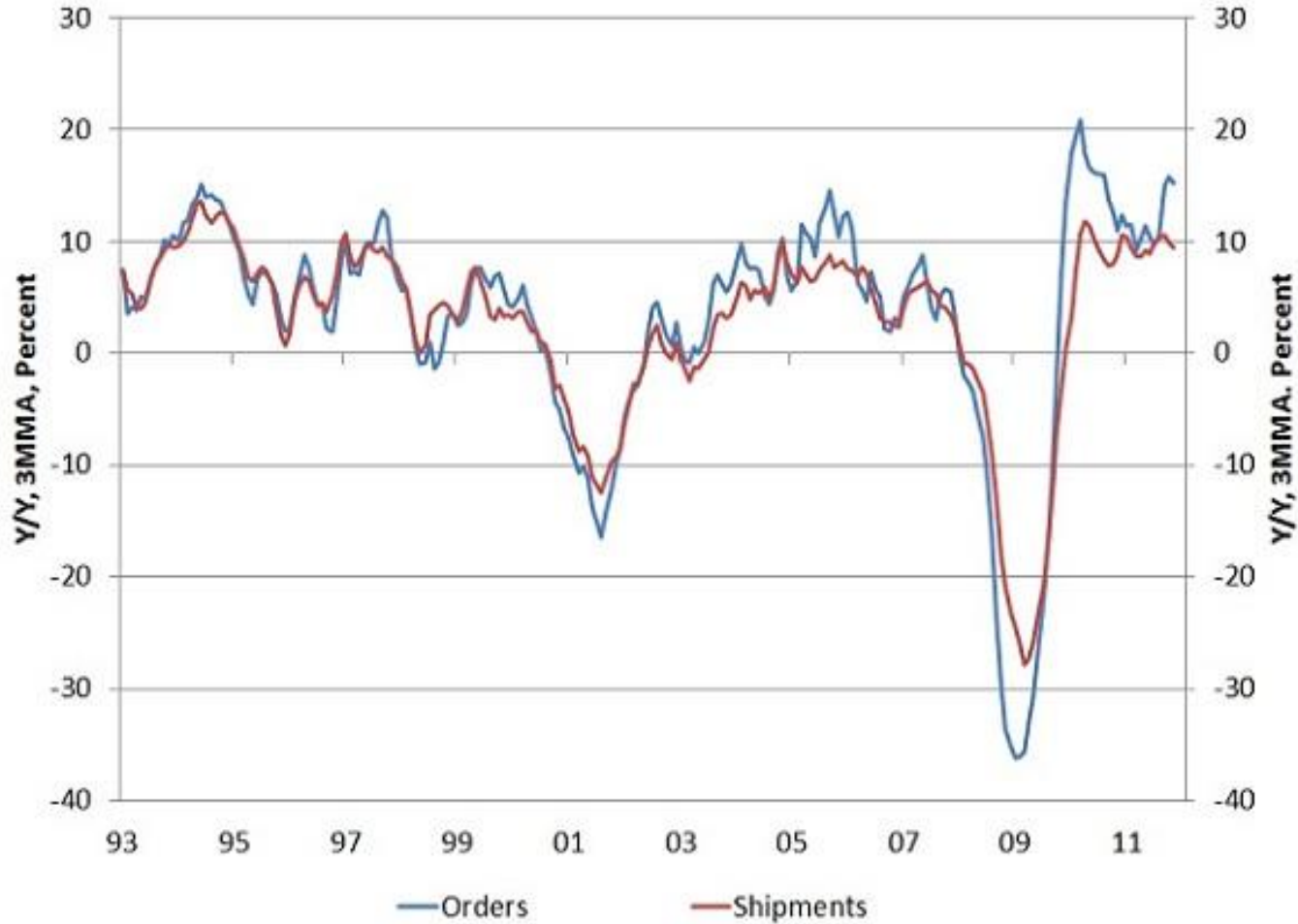
U.S. Manufactured Durable Goods (in Billions of Dollars)

New Orders, Shipments, and Inventories

Unfilled Orders



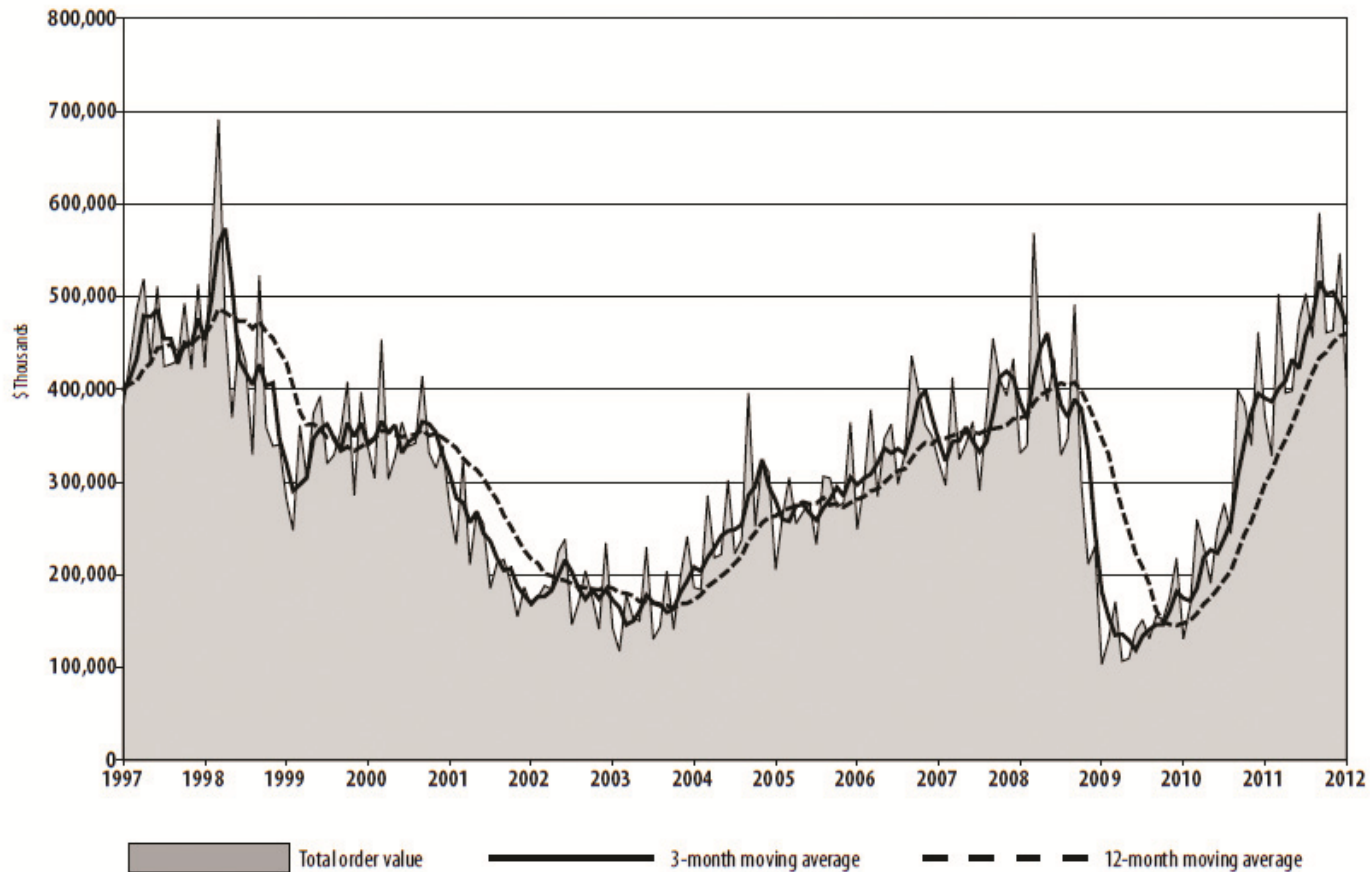
U.S. Manufactured Durable Goods Ex. Defense



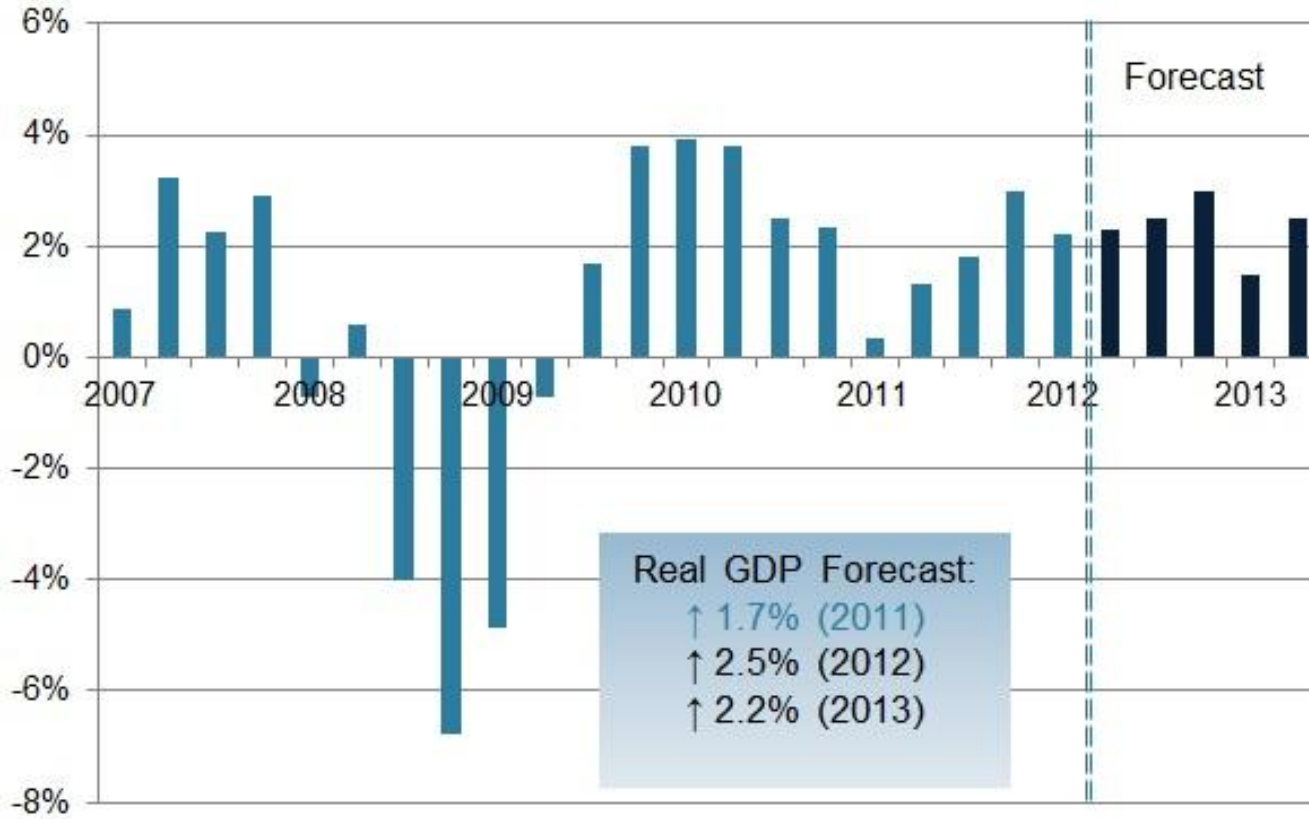


Total U.S. Manufacturing Technology Orders

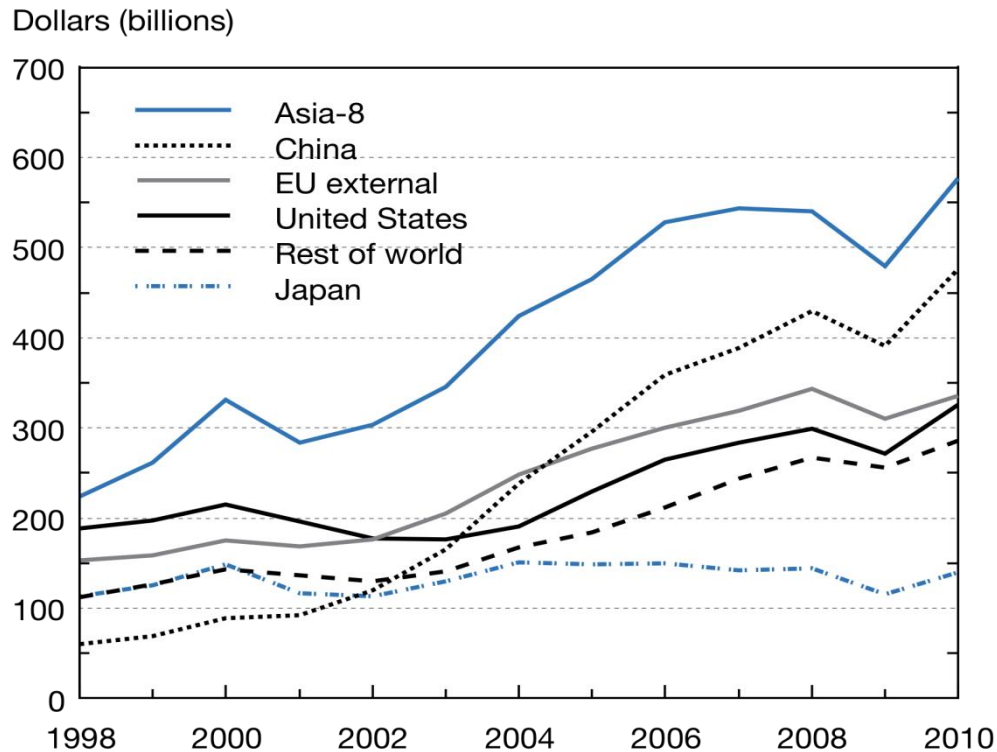
Through January 2012



U.S. Real Gross Domestic Product (Chained 2005 Dollars)



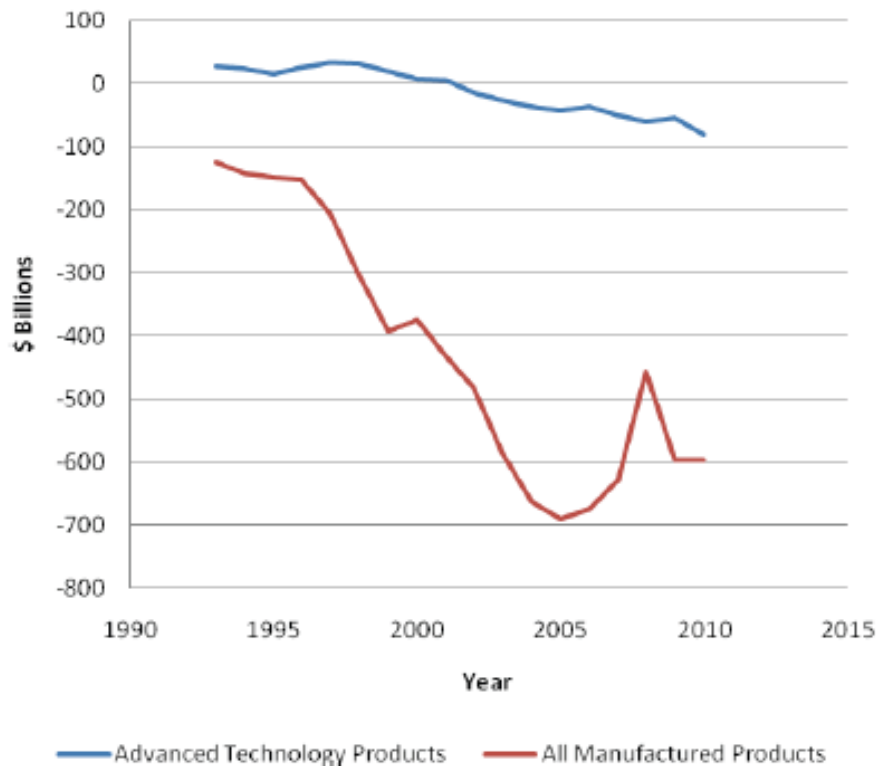
High-technology exports, by selected region/country: 1998–2010



U.S. National Science Board,
Science and Engineering Indicators, 2012

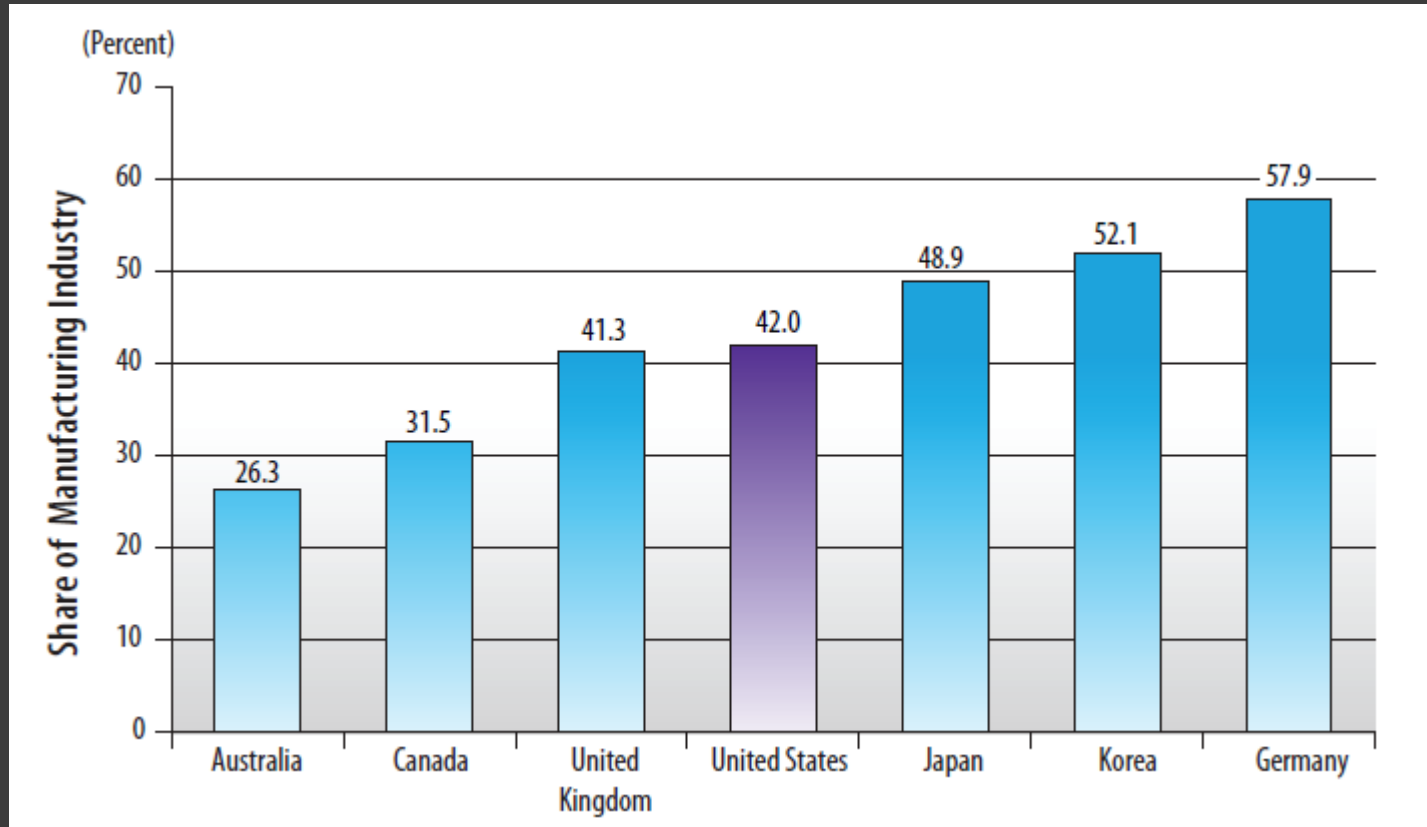


U.S. Trade Balances for High-Tech and All Manufactured Products



Source: Census Bureau, Foreign Trade Statistics, FT900: U.S. International Trade in Goods and Services, Exhibit 1s: Exports, Imports, and Balance of Goods by Selected NAICS-based Product Good (Manufacturing, total) and Exhibit 16a (Exhibit 15a for 2009 and earlier): Exports, Imports and Balance of Advanced Technology Products

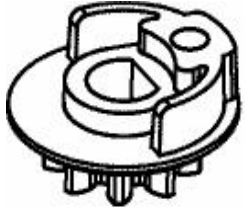
Share of Manufacturing Value-Added by Research-Intensive Manufacturing Sectors (R&D>3% of Sales)



Key Elements of Current Manufacturing Success

- ⦿ Practicing Lean manufacturing
- ⦿ Using advanced technologies
 - lasers, advanced CNC machines, Rapid prototyping, ERP, CAD-CAM integration, automation, nano manufacturing, sensors, on-machine metrology
- ⦿ Finding a unique niche
 - Ex: micro, energy, medical, aerospace
- ⦿ Innovation
- ⦿ Demonstrating ISO 9000 and related adherence to quality principles

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◎ Part
ready for
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◎ 1–3 Business Days

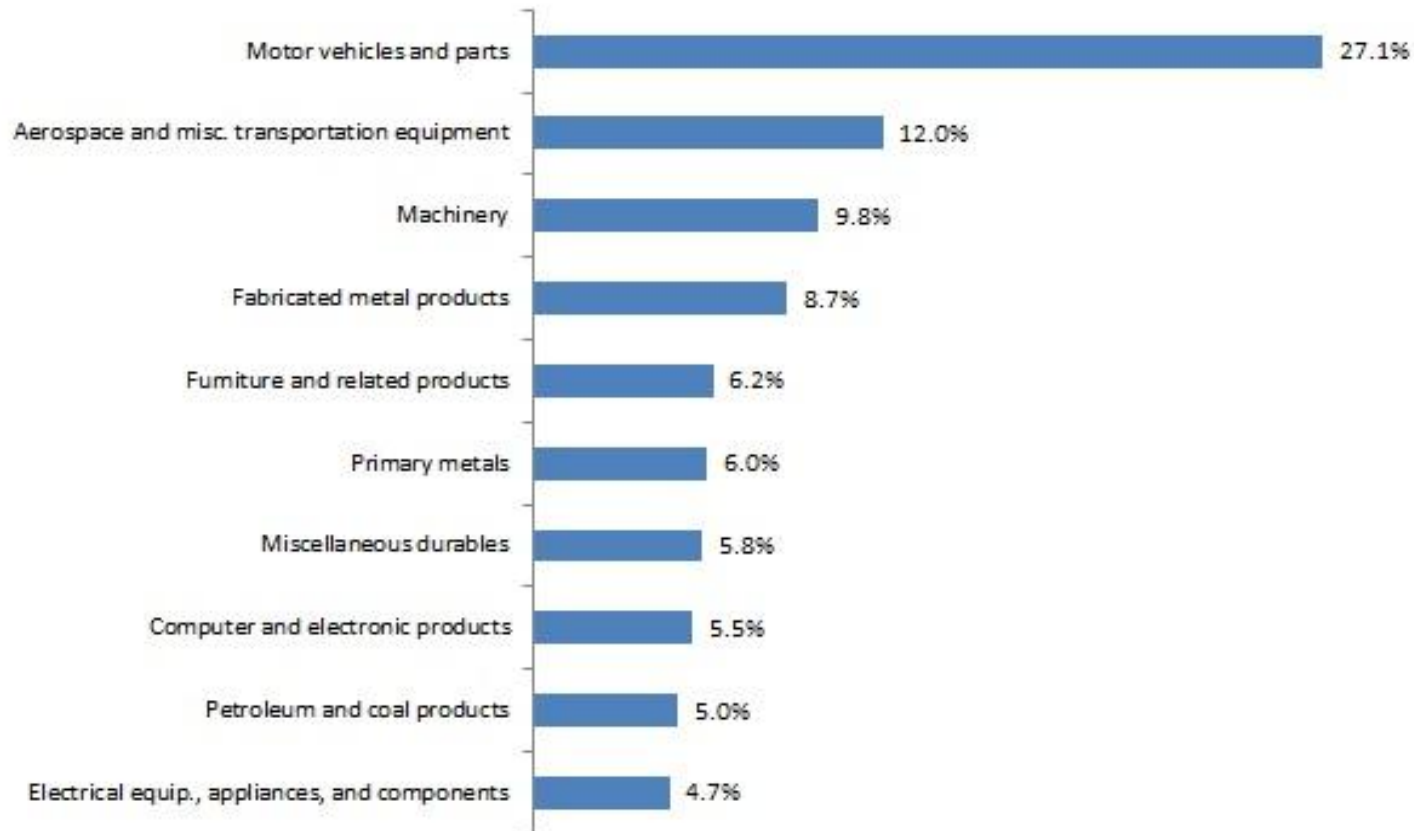


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Manufacturing Sectors with the Greatest Growth in Production, April 2011 to April 2012



Monday Economic Report , May 21, 2012, National Association of Manufacturers



Manufacturing Data Sources

The state of manufacturing is described by a combination of data analyzed and reported by:

- National Association of Manufacturers
- Federal Reserve
- U.S. Census Bureau
- Bureau of Labor Statistics
- Bureau of Economic Analysis
- U.S. Presidential Addresses
- U.S. President's National Science and Technology Council
- National Science Board
- National Academy of Engineering
- Institute for Supply Management
- The Conference Board
- The Manufacturing Institute
- The University of Michigan
- Numerous corporate studies
- Individual state studies

Administration Policy on Manufacturing







Michael Molnar

Chief Manufacturing Officer for the U.S.

Manufacturing Technology Data and Knowledge Source
www.sme.org



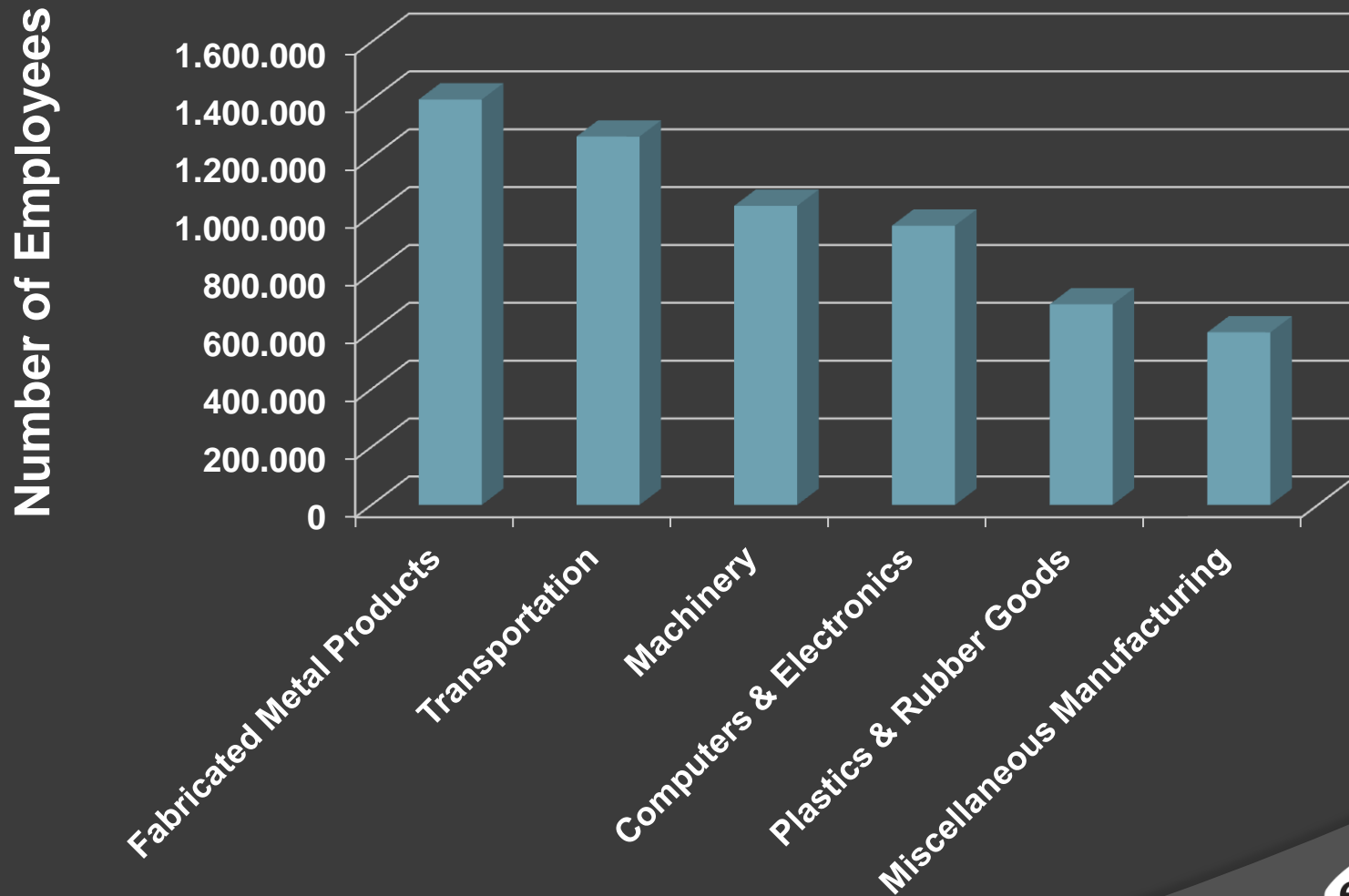
Many Sources Say Same Thing Using Different Metrics

Analyst	Analysis	Comment
Institute for Supply Management	Recent rate of growth has slowed (Purchasing Managers Index)	
U.S. Bureau of Labor Statistics	Job openings increasing 	Cannot find enough skilled help
U.S. Federal Reserve System	Manufacturers expect growth in production, employment, and investments for rest of 2012 	Industrial production rose 1.1% in April is rising at 6% rate year over year 
Conference Board Leading Economic Index	Avg. work week, new orders, credit availability 	Recent rate of growth has slowed
Conference Board Coincident Economic Index	CEI Index rose 0.2 in April 	
Manufacturing Institute		600,000 mfg openings unfilled in 2011
U.S. Census Bureau		Durable good orders fell 4.2% in March
U.S. Bureau of Economic Analysis	Mfg contributions to GDP increased 4% in 2011 - is now 12.2% of GDP 	Growth is leveling off

April Federal Reserve comment

- **Fifty-four percent of respondents in one district expect production in their company to increase**
 - but only 20.7 percent of them anticipate hiring additional workers.
 - An additional 22 percent plan to increase work hours without hiring additional people,
 - with another 17 percent planning to increase production through productivity gains.
- This is probably representative across the country

Employees in U.S. Key Manufacturing Industries

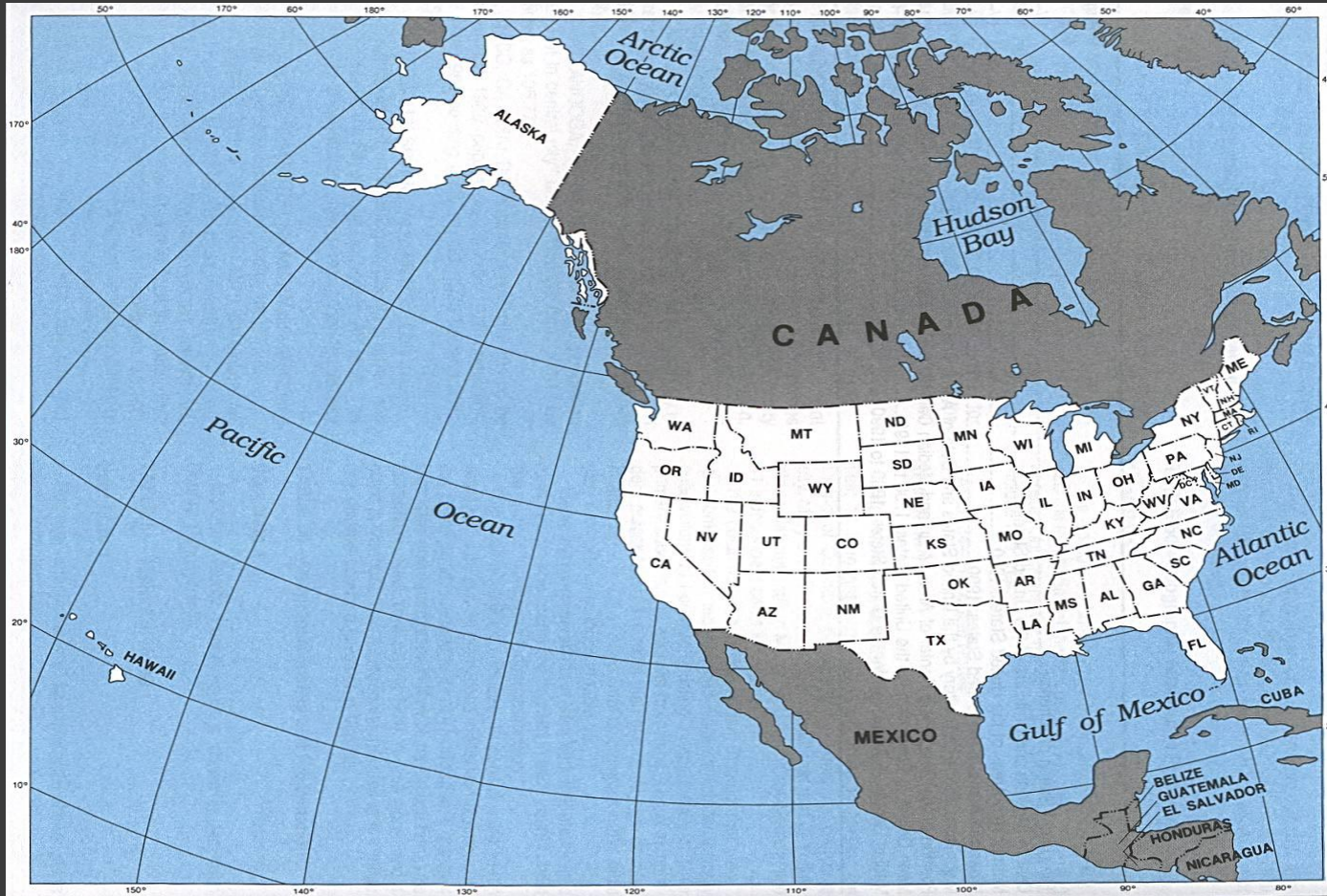


Key Manufacturing Industries



Source: U.S. Census, 2009 County Business Patterns

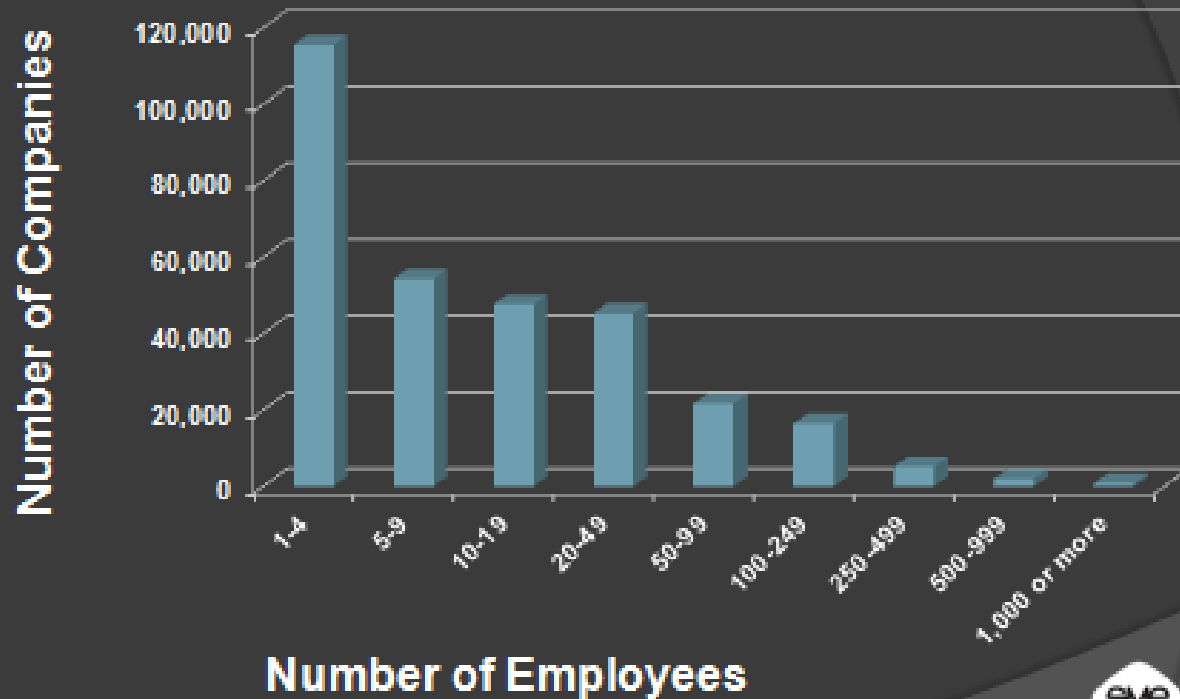
United State population in 2011 is 311,591,917



Total unemployed is 12,500,000



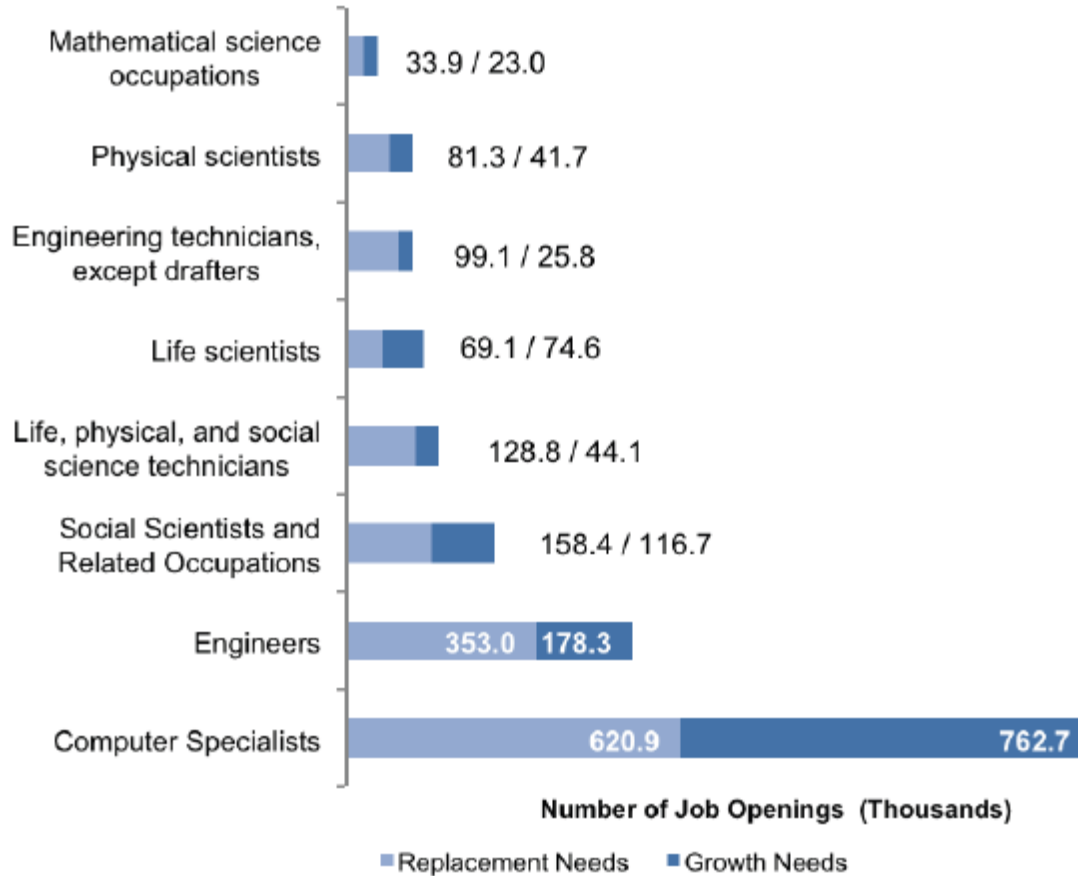
Size of U.S. Manufacturing Companies by Employees



Source: U.S. Census, 2009 County Business Patterns



U.S. Job Openings Projected in 2018



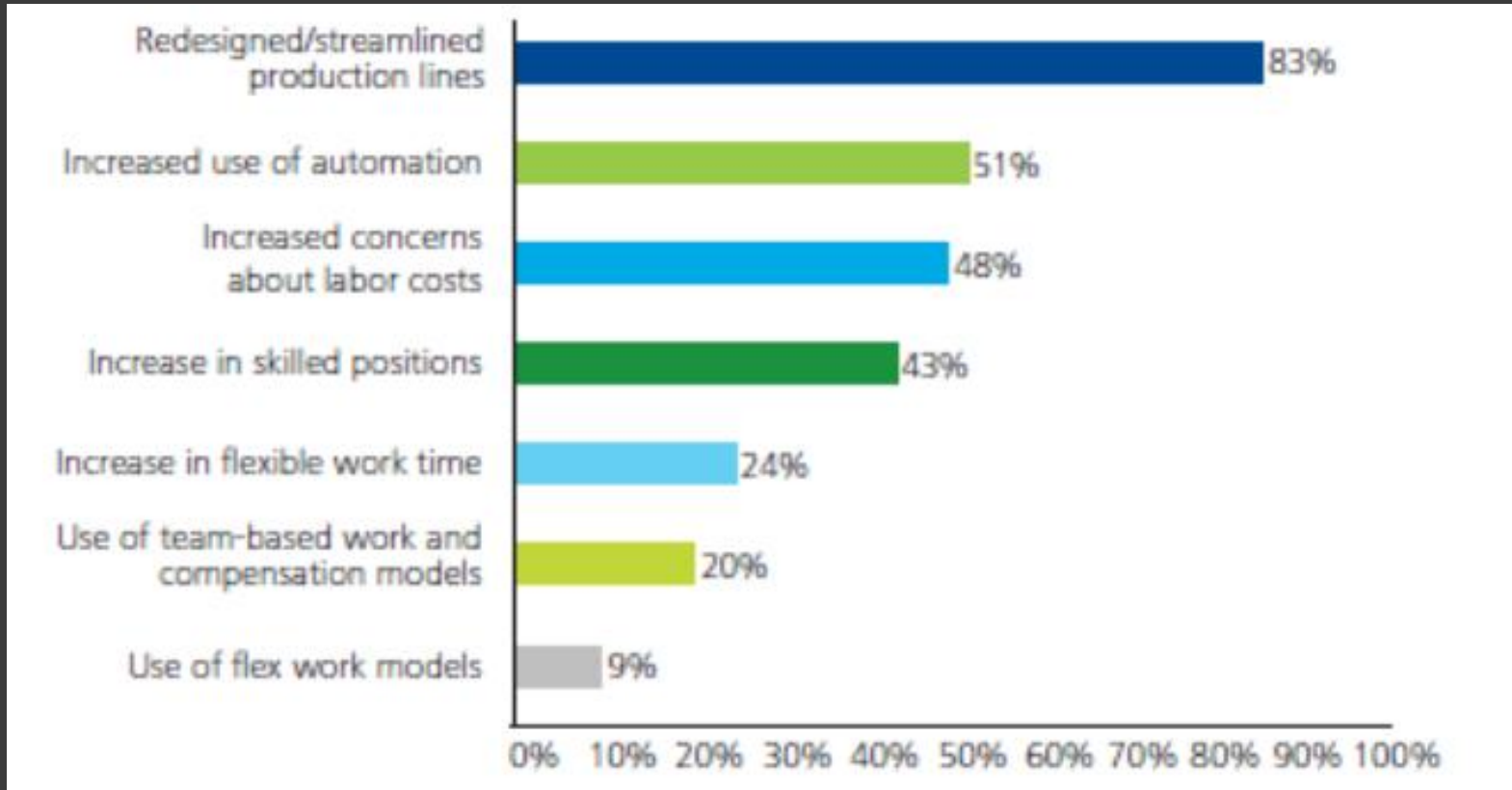
Derived from: Bureau of Labor Statistics.



People

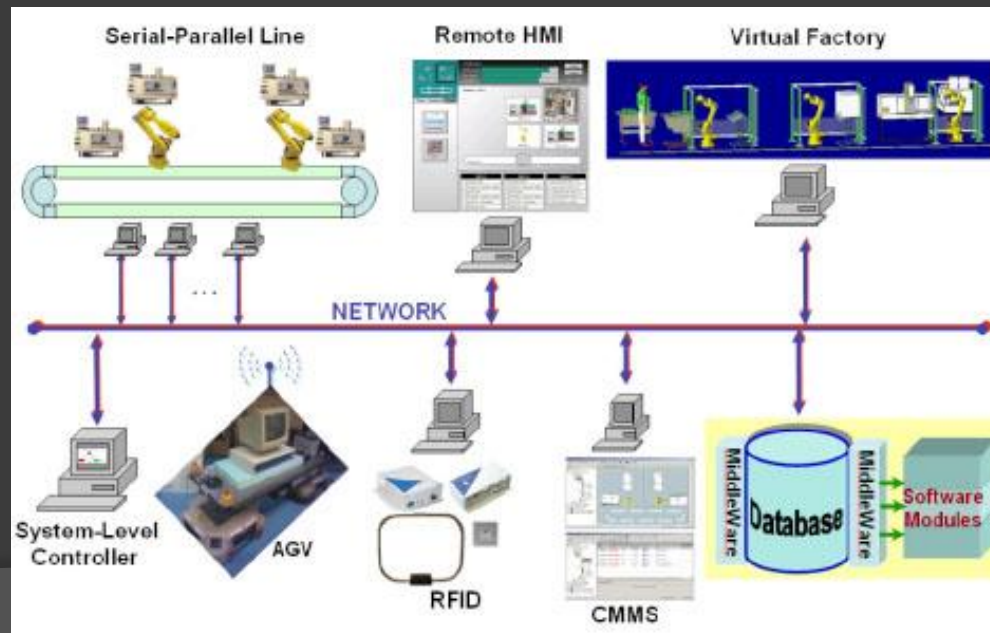
- ⦿ Manufacturing employs ~12,000,000 people
- ⦿ We lose 20-25,000 skilled machinists/year
 - Promotions, retirements, career changes, death, disability
- ⦿ We train ~8,000 skilled machinists/year
- ⦿ Public image of manufacturing
 - 78% of population believes mfg is important
 - 30% would encourage their children to pursue manufacturing as a career
 - Few parents or students ever see manufacturing
- ⦿ We have openings for ~600,000 manufacturing employees today

The Changing Nature of Manufacturing/Work in the U.S.

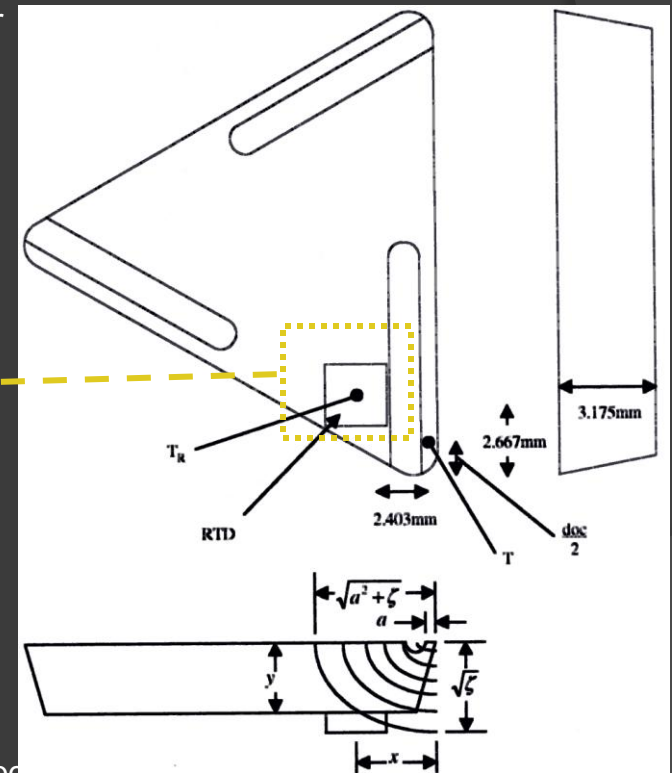
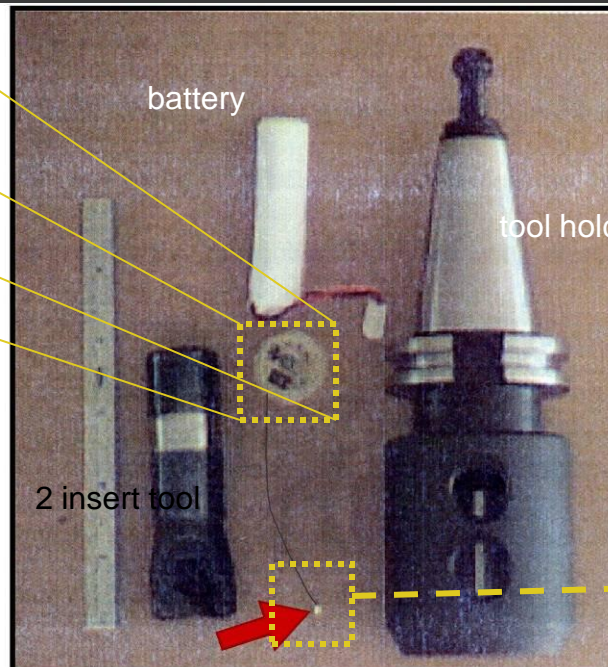
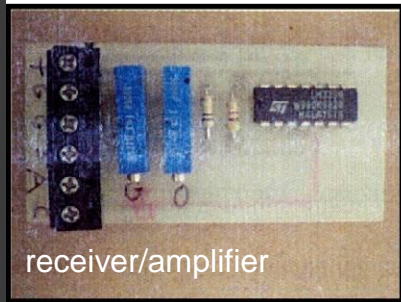
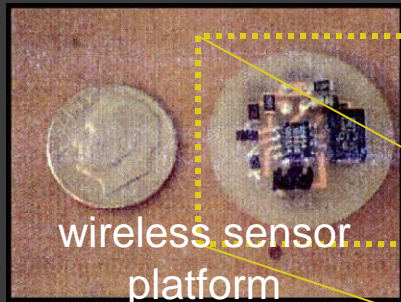


Manufacturing Information and Control

- Software and hardware control frameworks
- Control logic approaches
- Networks for control diagnostics and safety
- Virtual and real environment fusion.



Wireless sensor hardware and location on insert



sensor location on insert

Changing the Workforce

Moving Toward a Renaissance in Advanced Manufacturing

- Increasing the number of STEM graduates
- Increasing the number of manufacturing degree programs
- Integrating education in manufacturing across disciplines
- Fostering a common understanding of manufacturing
- Using a Manufacturing Competency Model
- Employing a Skills Certification System with national portability and recognition

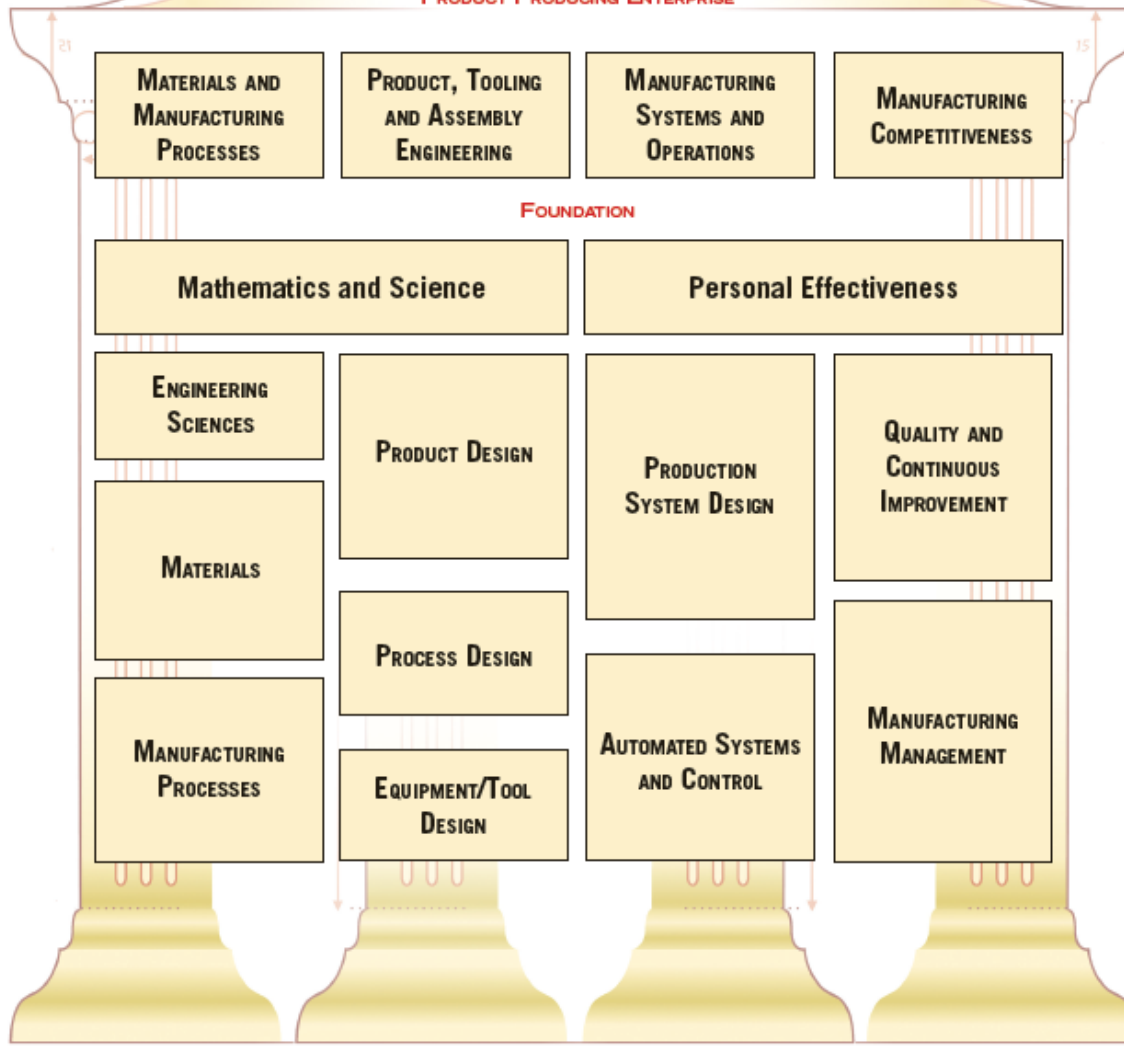


An Integrated Workforce Development Strategy



FOUR PILLARS OF MANUFACTURING ENGINEERING

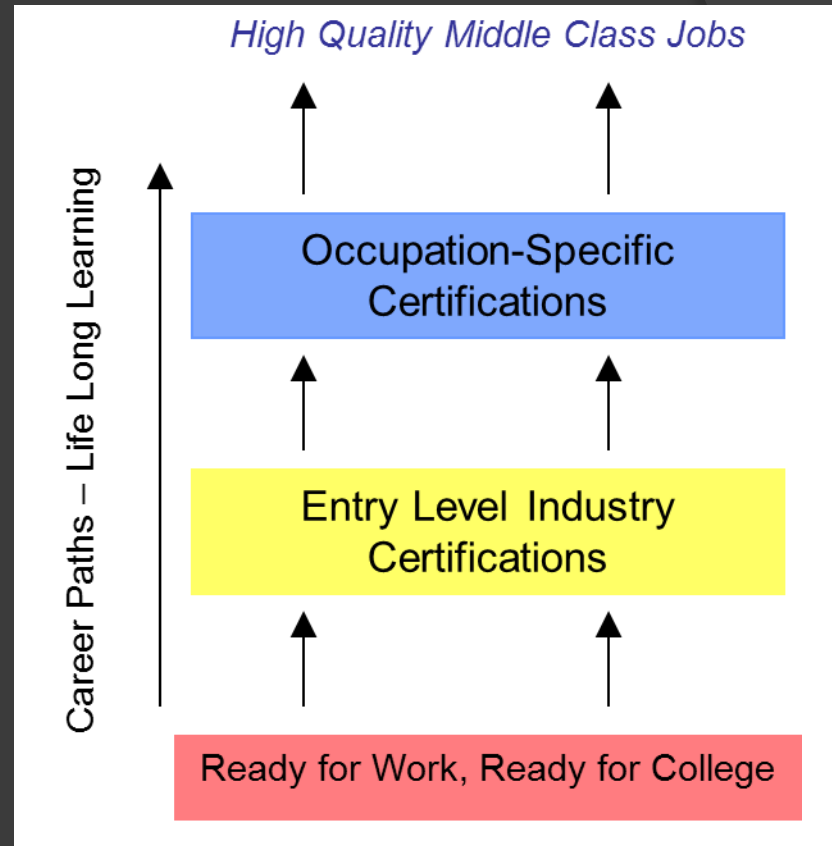
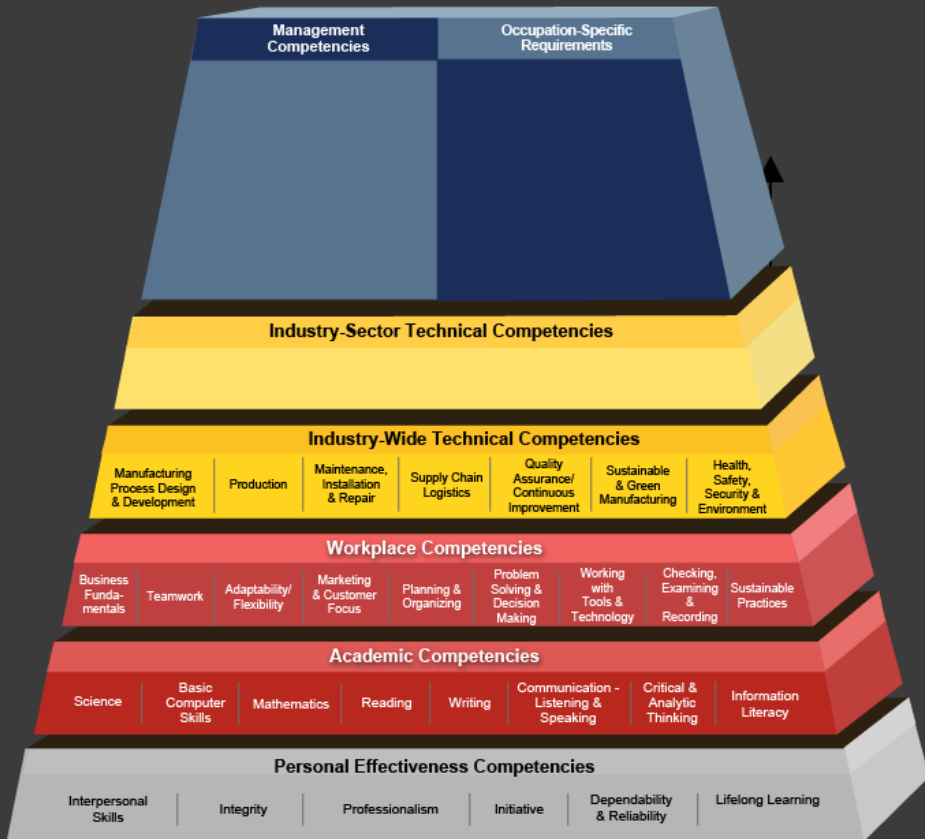
PRODUCT PRODUCING ENTERPRISE



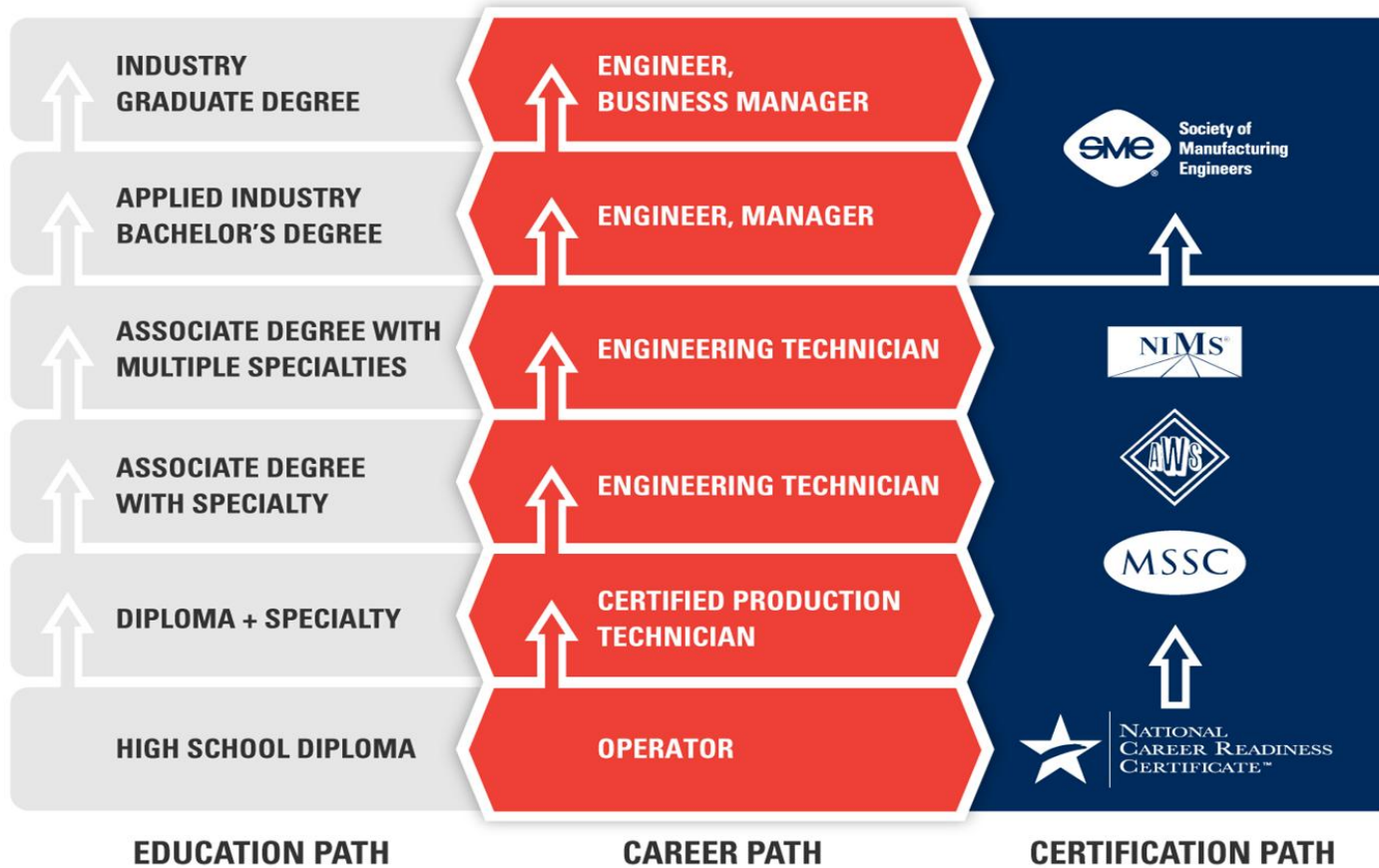
Society of
Manufacturing
Engineers



Advanced Manufacturing Competency Model



Skills Certification System



Summary

- ⦿ Manufacturing is growing in 2012
- ⦿ All areas of manufacturing (in general) are growing
- ⦿ Growth rate is less than pre-2007
- ⦿ Shops with advanced equipment are highly productive/competitive
- ⦿ There is a major emphasis on innovation in many companies
- ⦿ High Technology areas are future growth areas
- ⦿ World economy has large impact on our manufacturing
- ⦿ Government policies influence manufacturing
- ⦿ **Government, educators, shop owners, and general public know manufacturing is important to our economy**
- ⦿ Adequate numbers of skilled workers is key to our continued success



Revitalizing manufacturing for the company, the individual and the economy

