

Modeling, Simulation, and Analysis (MS&A) a Critical Element in U.S. Industrial Success

- Academic Centers

- **Expertise** – State academic centers have the necessary expertise, consulting services and tech resources
- **Economic Development** – Centers *neutral source* for university/industry collaborations
- **Sustainability** – State budget demands require academic centers to find new or additional sources of revenue

- Industry

- **Global Competition** - Industry must adopt new technologies to compete
- **Time, Quality & Cost** – MS&A provide a competitive edge
- **Lack of Internal Capacity** – Industry cannot afford to purchase and does not have the internal expertise to operate the needed MS&A capacity

OSC's Industrial Outreach Program

Blue Collar Computing



**Blue Collar
Computing™**

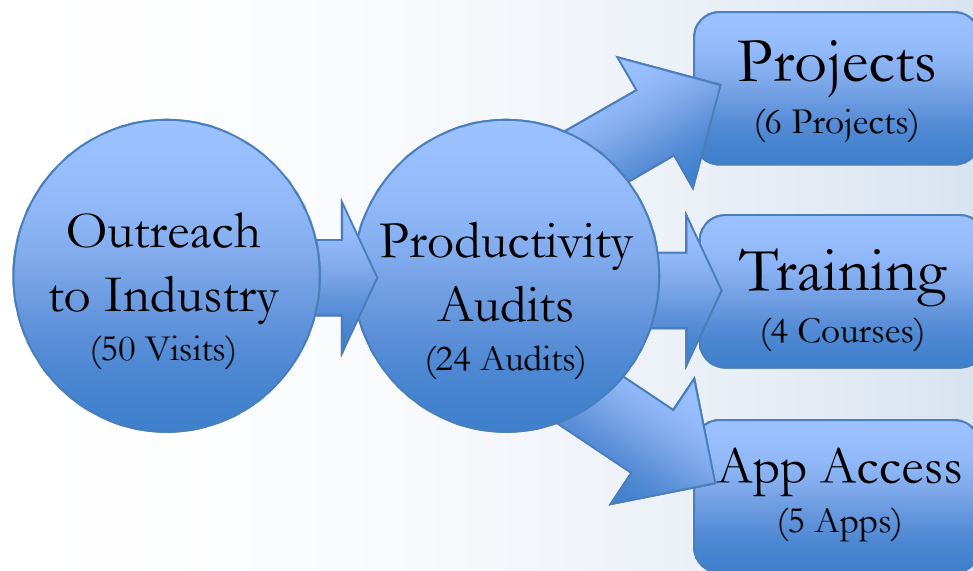
an initiative of the Ohio Supercomputer Center

OSC's Industrial Partner Examples

- AP Solutions
- Apparent Networks
- Delphi
- **Procter & Gamble**
- Girindus
- Central Ohio Auto Manufacturer
- Polycom
- **Edison Welding Institute**
- **Battelle**
- IAP Research
- American Distance Education Consortium
- AlphaStar
- Nimbis
- Alliance for High Performance Digital Manufacturing
- Council on Competitiveness
- ALTASIM Technologies
- Composites DOC
- Huawei Technologies
- **PolymerOhio**
- KISTI
- Moldex3D
- Sciences Computers Consultants
- SAEC/Kinetic Vision
- Nymirum
- Red Cedar Technology
- Fireline TCON
- M7 Technologies
- **Rolls Royce**

Advanced Modeling, Simulation, and Analysis (MS&A) for Manufacturing

- Funded by NIST Manufacturing Extension Partnership (MEP) for PolymerOhio & OSC (~\$700K for 1st year)
- Mission:
 - Raise awareness of MS&A in Polymer industry and MEP system
 - Make cost-effective computational methods available to SMEs

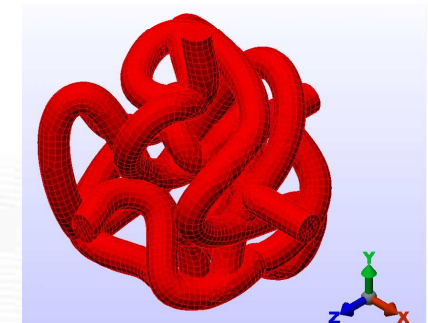


Resulting case studies will provide an MEP model to:

- Illustrate MS&A value to production and profitability
- Assist companies in application selection
- Develop training for high value-added MS&A apps
- Engage companies in employee training for MS&A
- Provide broad access to low-cost, productivity-enhancing apps

NSF SADI Program

- NSF SADI (Software Application Discovery Initiative) Small Industry Study on Composite Materials
 - Goal: bridge the gap between computational scientific community and the manufacturing industry
 - OSC collaboration with Youngstown State and Fireline Tcon, Inc.
 - Modeling ceramic/metallic composite material:
 - Tcon develops molten metal handling, melt treatment and castings
 - Promising potential applications: vehicle brake pads and force protection for military personnel and vehicles
 - Tcon material properties now found through trial and error. Seek to develop models allowing engineers to tailor materials to application.
 - Partners: USC Information Sciences Institute, OSC, NCSA



*Ceramic/ Metallic
Component Model*

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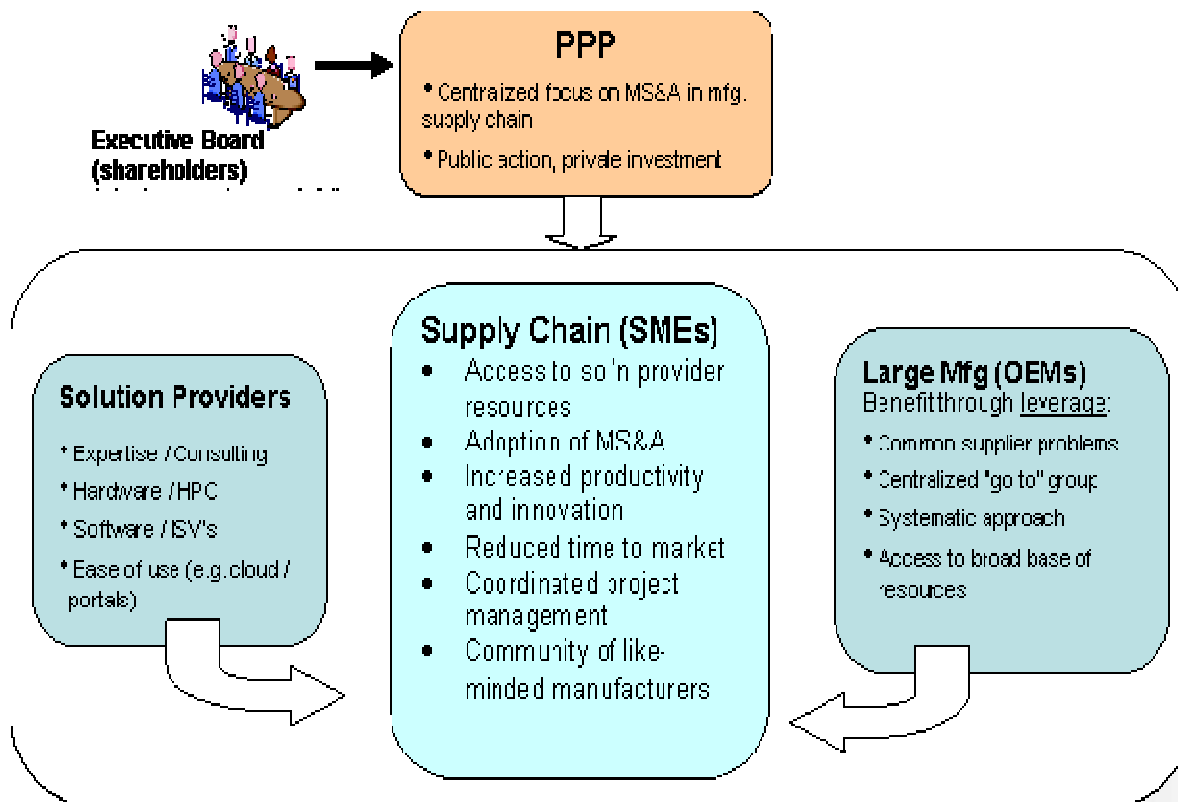


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National Digital Engineering and Manufacturing Consortium (NDEMC)

- Economic Development Administration Economic Adjustment Assistance Project for four-state region
 - Illinois, Indiana, Ohio, and Michigan
- Goal: Introduce MS&A to small- and medium-sized manufacturers who do not have resources to bring this technology into their workflow to diversify their product base
- Project focused on developing and accessing innovation capacity through regional and national MS&A networked assets that are accessible and affordable to these manufacturers
- Lead Applicant: Council on Competitiveness
- Co-applicant: NCSA, NCMS, OSC, and Purdue University

National Digital Engineering and Manufacturing Consortium (NDEMC)



- Public-private implementation arm
- U.S. Government vision for structure
- Lowers barriers
- Enables collaboration
- Demonstrates US Govt. commitment to process

- Need catalyst for SME entry into, and advancement of, digital mfg. infrastructure & operations
- Centralize and systematize approach through the Consortium; leverage commonalities across manufacturers and unify R&D
- Benefit U.S. mfg. through increased productivity and innovation. Demonstrate ROI to OEMs

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OSC's Workforce Development Program

Ralph Regula School of Computational Science



OSC STEM Workforce Developments

- Ralph Regula School of Computational Science leads the nation in computational science education
 - Undergraduate minor program available at 14 campuses
 - Associate of Science concentration program began Autumn 2009
 - Several “stackable” certificates for manufacturing in place
 - Advanced certificates in polymer manufacturing
 - Working with the National Association of Manufacturers on an advanced certificate program in metal forming
- RRSCS Director Steve Gordon is a national leader in Computational Science education and chairs the education committee for the Great Lakes Petascale Consortium

Ralph Regula School is winner of a **national Krell Institute Undergraduate Computational Engineering and Science Award** and was highlighted in the August 31 *Chronicle of Higher Education* edition on academic programs of the future, “How They Did it: Computational Science”

Questions?

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