



NDEMC: A Public-Private Partnership to bring MS&A and HPC to SME's

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Public Private Partnerships (PPPs) are innovative methods used by the public sector to partner with the private sector, who bring capital and expertise to deliver projects on time, on budget and meeting expectations. PPP's are effective and efficient ways of deploying solutions at scale for the social and economic benefit to the public.

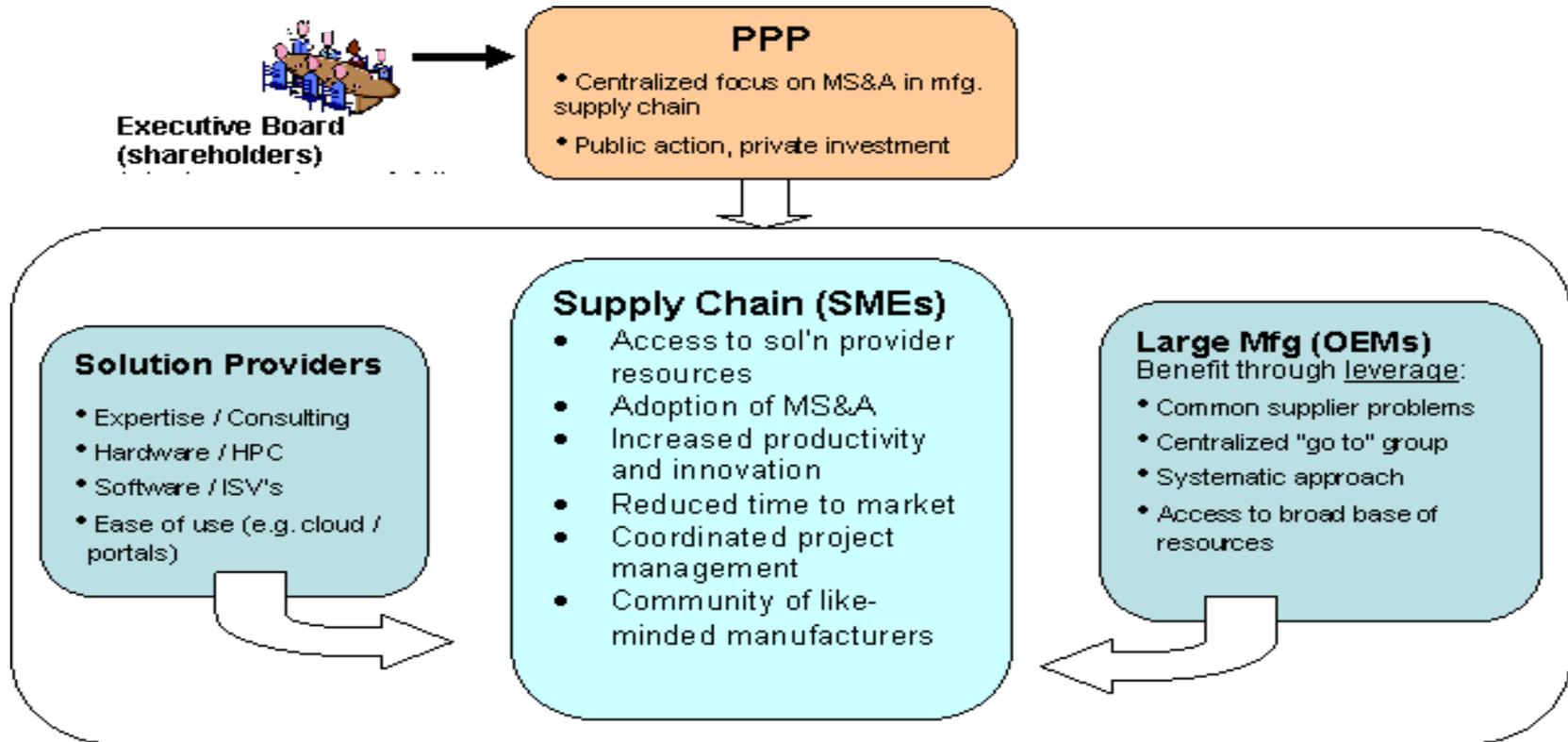
PPPs are important tools to bridge innovation strategies where the marketplace has not been effective at scale to date. PPPs can provide a number of specific benefits to enhance economic development and economic return through:

- increased product quality at same or lower cost
- higher levels of service
- reduced risk
- decreased time to market
- enhanced capabilities offered in bidding
- the creation of highly-skilled technical workforces

The ***National Digital Engineering and Manufacturing Consortium (NDEMC)*** is being developed for the purposes of piloting a program to promote adoption and advancement of Modeling Simulation and Analysis (MS&A) in Small Manufacturing Enterprises (SMEs) and the U.S. manufacturing supply chain, initially focused in the U.S. Midwest. The end goal is to give U.S. based manufacturers tools that will help them be more competitive in the global economy and help retain and grow a strong manufacturing in the U.S.. NDEMC has two initial focuses:

1. Create a single point of entry portal that will support Software as a Service (SaaS) in a cloud environment that will link High Performance Computing (HPC) providers, university researchers and other technical support and private sector consultants.
2. Do a series of demonstration project that prove the business case for MS&A and HPC in the SME community and develop a replicable model that can be expanded to other regions of the U.S.

- **OEMs**
 - The Procter & Gamble Company
 - Lockheed Martin
 - General Electric
 - Deere & Co.
- **Solution Partners**
 - Ohio Supercomputer Center
 - National Center for Supercomputing Applications (U. of Illinois)
 - Purdue University
 - National Center for Manufacturing Sciences
 - SCRA/ATI
 - Council on Competitiveness
- **State Governments**
 - State of Ohio
 - State of Indiana
- **Federal Government**
 - White House
 - Dept of Commerce (EDA)
 - Department of Defense (OSD/AFRL/ ARDEC)
- **Other MOU signees**
 - DOE
 - NIST
 - NASA
 - OSTP



- 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

NDEMC is developing and fostering a new manufacturing focused community linking:

- U.S. Manufacturers,
- Commercial software developers,
- Hardware vendors,
- Universities, and
- National laboratories

1. Teams of experts provide **specialized consulting/training** in MS&A
 - Deployed to SME sites for personalized consulting and training
 - Based at institutions with modeling and manufacturing expertise



2. On-line **manufacturing portal** for computation
 - Access to broad base of expertise
 - On-line interactive professional education
 - Cloud-based computing resources
 - Easy web-based access to engineering and manufacturing software



Deployed field consultant/trainers will be key to ensuring these two thrusts complement, and are informed by, each other

Portal will have (4) major pieces:

1. Commercial financial transaction capabilities (like amazon.com)
2. Searchable catalog/database of MS&A software's and other analysis software's
3. MS&A tech support/counseling from a trusted 3rd party (universities, etc)
4. MS&A consulting service providers

NDEMC is designed to accommodate the broad MS&A needs of SMEs

- **Common issues / leveraging**

- SMEs can **share** solutions and influence 3rd party development
- Domain application portals **simplify** usage of codes
- Needs served by **existing** commercial codes and readily available hardware resources

VS.

- **Highly customized needs and requirements**

- SMEs require **specialized** capabilities not currently available in commercial software
- **Collaboration** with external R&D may be needed (universities and/or national laboratories)

In both cases, *community promotes efficiency*

- **OEMs**
 - Increased collaboration with supply chain
 - More innovative, integrated, and efficient supply chain
 - Access to large community of MS&A/HPC expertise and influence
- **Software Providers**
 - Increased market penetration of products
 - First-hand access to requirements for product development roadmaps
- **SMEs**
 - Reduced time to market
 - Enhanced throughput
 - Reduced waste
 - Increased safety and sustainability
 - Reveals critical information to inform decision-making.
- **U.S. Government**
 - Highly skilled U.S. workforce
 - Increased global competitiveness

- (7) Demonstration projects launched in November. All will be completed within 90 days (first of 30-40 demonstration projects)
 - Demonstration projects will include MS&A applications across the entire product life cycle
 - Case studies will be developed and published on all demonstration projects
- Portal is underdevelopment with direct linkage to High Performance Computing (HPC) through a cloud application
- Created a searchable catalog of (143) software's available to SMEs through the portal
 - Negotiating with other software supplier to expand the catalog of products available to the SMEs

The DoD has a number of active programs that could benefit from the work of NDEMC and build off of it instead of reinventing it.

Examples:

- Advanced Manufacturing Enterprise (AME)
- Model Based Engineering (MBE)
- Connecting American Manufacturing (CAM)
- DARPA's Open Manufacturing
- Others????

Questions and/or comments?