Overview | September 2016

Digital Manufacturing and Design Innovation Institute (DMDII)
Innovation
Industry Call to Action

97% of CEOs say that digital innovation is key to future performance.

1 in 5 CEOs believe their innovation process is providing a competitive advantage.

Less than 1/4 of large companies are jointly developing solutions with entrepreneurs.

#1 Obstacle for innovation is slow development cycle times.

77% of companies report a boost in financial results from collaborative innovation.

68% of companies are open to risk-sharing associated with innovation.

THE MESSAGE IS CONSISTENT:

COMPANIES NEED TO INNOVATE – BETTER, FASTER, CHEAPER and that’s very hard to do.
Industry’s Role
The Next Revolution
The Fourth Industrial Revolution

The Start of the Fourth Industrial Revolution

1st Industrial Revolution – water and steam powered mechanical manufacturing facilities
End of 18th century

2nd Industrial Revolution – manufacturing assembly line and infrastructure of electricity, gas, water, telegraph, roads
Start of 20th century

3rd Industrial Revolution – electronics, telephones, PLCs, NC machines, PCs, CAM, CIM, spreadsheets, Lean manufacturing
Late 20th century

4th Industrial Revolution – mobile, cloud, smart connected devices, cyber physical systems, smart factory, robots, mass customization, product as-service
Today

Productivity, Complexity
The Fourth Industrial Revolution

IoT – Industrial Internet of Things

Smart Factory

Data-driven factory of the future

Digital Thread

Manufacturing 4.0

Industry 4.0

Intelligent Factory

Factory of the Future

“Digitizing the shop floor”
The Fourth Industrial Revolution

 Uh, hi.
 I’m the Newbie.

 COMPETE SMART
 Montana Manufacturing Conference 20 YEARS
 MAKING it happen
 under the BIG SKY
The Fourth Industrial Revolution

What forces are driving the digitization of manufacturing operations?

Challenges

- Separation of designers and makers has slowed innovation
- Barriers for Sharing Data and Information including: technology, skills, incentives, security, trust, IP, standards
- Increasing cost of labor globally, skills gap
- Rising costs of materials and supply constraints

Opportunities

- Digital link between designers and makers
- Digital connections to physical assets machines, factories, and supply chains
- Data aggregation and analysis to do more with existing resources
ANNUAL NEW DATA STORED BY SECTOR

Despite the recognition of importance for digital design and manu-acturing, most organizations feel they lack the necessary capabilities.

- 81% Participants indicating digital ops is a critical driver of future competitiveness
- 14% Organizations with "high" digital capability today

SOURCE: DMDII Survey
DMDII.ORG

DMDII x UI Labs Collaboration
The Fourth Industrial Revolution
ANNUAL NEW DATA STORED BY SECTOR

Manufacturing: 1,812
Government: 911
Banking: 773
Communications: 776
Retail: 424
Prof Services: 397
Securities/Invest: 336
Healthcare: 375
Education: 276
Insurance: 273
Transportation: 256
Wholesale: 245
Utilities: 207
Resource Indus: 166
Consumer Services: 116
Construction: 87
What is Digital Manufacturing
Digital Thread
“The ability to connect different parts of the manufacturing life-cycle through data, and utilize that information to make smarter more efficient business decisions”
The digital thread is a single, seamless flow of information that connects a series of data-driven events and stretches across the 5 phases of the product life cycle (PLC) below:

1) CONCEPT - Requirements Development (Customer Requirements),
2) DEFINITION - Design and Analysis (Product Technical Data Package [TDP]),
3) MATERIALS & MANUFACTURING - Manufacturing and Assembly (Process/Production Planning),
4) USE & SERVICE - Repair/Maintenance
5) END OF LIFE – Recycle and Disposal
Who is Using DM&D

+ All of the large OEMs and most of their Tier 1 suppliers in

Aerospace & Aviation
(Lockheed Martin, Boeing)

Automotive
(Honda, Ford)

Agribusiness
(Procter & Gamble)

Energy
(LG, FirstSolar)

Advanced Manufacturing
(Intel, Whirlpool)

Impact on Supply Chains

» 500,000 are employed through Boeing's supply chain
» 5,400 supplier factories, including sub-tier suppliers
» Over 750 million components and assemblies procured in single year
Traditional Product Lifecycle

Product or System Life Cycle

Concept
- Hand Sketches
- Hand Sculpting
- Mechanical Prototypes

Definition
- Hand Calculations
- Reference Books
- Hand Drafting
- Paper Blueprints
- Domain Experts
- Design Experts

Materials & Manufacturing
- Broad Labor Force
- Basic Logistics
- No Just-In-Time Materials & Product Management
- Manual Machines
- Basic Machine Automation
- Manual Assembly
- Paper Travelers

Use & Service
- Diagnostics Performed by Technicians
- No Maintenance Log
- No Performance Log

End of Life
- Basic Recycling
- No End-of-Life Feedback

19
DM&D Product Life Cycle

Product or System Life Cycle

Concept
- Digital Sketches
- 3D Rendering
- Digital Prototypes
- Virtual Environments

Definition
- Hand Calculations
- Reference Databases
- Smart Design Tools
- CAD and CAM
- DP2 Digital Product Definition Package
- TDP Technical Data Package
- Domain Experts
- Design Experts

Materials & Manufacturing
- Semi to Skilled Labor
- Advanced Logistics
- Just-In-Time Materials & Product Management
- Automated Machines & Systems

Use & Service
- Diagnostics
- Performed Product or System
- Digital Maintenance Log
- Digital Performance Log
- Advanced Services

End of Life
- Greater Recycling
- End-of-Life Feedback
Product or System Life Cycle - Traditional and DMD

Concept

- Hand Sketches
- Hand Sculpting
- Mechanical Prototypes

Definition

- Materials & Manufacturing

Use & Service

- Digital Sketches
- 3D Rendering
- Digital Prototypes
- Virtual Environments

End of Life
Automated Manufacturability Software “ANA”

Software package to provide designers with feedback early in the design process

Industry Challenge
One of the challenges faced in reducing time-to-market is how to sufficiently evaluate a design to predict problems of performance, manufacturability, assemble-ability, durability, and serviceability.

Project Solution and Outcomes
• Modules for four processes created; machining, casting, die casting, & welding, will be built into “ANA”, an integrated manufacturability analysis solution
• A Manufacturability Dashboard for ANA will be developed to provide users with quick access to large amounts of manufacturability information. One click and the part geometry is analyzed within minutes with color 3D reports

Transition and Commercialization Opportunities
ANA will be platform independent, and thus be available as part of a CAD/CAM platform, on a website, or as a standalone application. The Lucrum Group will develop a market study and commercialization plan.

Potential Impact to Industry
Huge savings could be realized when downsizing from mass production of the part to smaller lot sizes. ANA can be positioned as a designer’s “virtual assistant” during conceptual design, and the designer will have new knowledge that can drive down costs and lead time while producing a more flexible design that can shift to different manufacturing processes as needed.
Product or System Life Cycle - Traditional and DMD

Concept

Definition

- Hand Calculations
- Reference Books
- Hand Drafting
- Paper Blueprints
- Domain Experts
- Design Experts

Materials & Manufacturing

Use & Service

End of Life

- Smart Design Tools
- CAD
- CAM
- DP2 Digital Product Definition Package
- TDP Technical Data Package

Product or System Life Cycle
Mind the Gap

Closing the Gap Between CAD and CNC with Machine Code Generation and Tooling Optimization Services

Industry Challenge
Today, machining solutions are developed in a CAM system by an operator reading a 2D drawing. This method is fundamentally limited because the result is a machine program that is tied to a single machine & setup.

Project Solution and Outcomes
• Numerically Controlled (NC) Code generation service
  • NC code determines the path of the operation. It will be automatically generated based on the 3D model
• Process monitoring service
  • Remote monitoring of a machine tool during operation to monitor tool path & make adjustments
• Tool optimization service
  • Creates optimized tool configuration to be used to produce the 3D part. By optimizing tools, tool life can be increased, reducing overall tool costs

Transition and Commercialization Opportunities
At the end of the project the new services will be integrated into the DMC. The fully developed services will be integrated into the STEP Tools product line.

Potential Impact to Industry
• The time to generate NC programs can be reduced by >35% with increased automation
• The tooling optimization service could result in a 15-30% improvement in tooling efficiency, realized as faster machining and/or reduced tool wear
• The benefit of the 3D Process Monitoring service is a 50% or more reduction in operator attendance time.
Product or System Life Cycle - Traditional and DMD

Product or System Life Cycle

Concept

Definition

Materials & Manufacturing

Use & Service

End of Life

Product or System Life Cycle - Traditional and DMD

- Broad Labor Force
- Basic Logistics
- Manual Machines
- Basic Machine Automation
- Manual Assembly
- Paper Travelers

- Semi to Skilled Labor
- Advanced Logistics
- Just-In-Time Materials & Product Management
- Automated Machines
- & Systems
- Automated & Mixed
- Assembly
- Digital Travelers and Work Instructions
Product or System Life Cycle - Traditional and DMD

Concept
Definition
Materials & Manufacturing
End of Life

Use & Service

• Diagnostics Performed by Technicians
• No Maintenance Log
• No Performance Log

• Diagnostics Performed Product or System
• Digital Maintenance Log
• Digital Performance Log
• Advanced Services
Product or System Life Cycle - Traditional and DMD

- Concept
- Definition
- Materials & Manufacturing
- Use & Service

End of Life

- Basic Recycling
- No End-of-Life Feedback

- Greater Recycling
- End-of-Life Feedback
Relevance to Small to Medium Manufacturers
Relevance to SMM’s

DM&D enables SMMs to:

+ Receive digital product designs (TDP) and/or specifications directly from a customer’s engineering and design systems, automatically translating those into machine specs, and producing a new product with minimal human intervention.

+ Give a customer real-time machine status, quality parameters, and production status as an order is being fulfilled.

+ Automatically monitoring the entire SMM supply chain for a customer’s product, and managing the production processes to optimize machine utilization and delivery schedules in real time.

Business Justification:

+ Accelerates new product introductions

+ Creates closer partnerships with customers and suppliers

+ Shortens the lead time concept to production

+ Optimizes production execution

+ Decreases operating costs

+ Ensures overall product and process quality

+ Decreases production through-put time
Relevance to SMM’s

Internal:
+ Connecting the pieces of the manufacturing plant and processes (machines, people, inbound logistics, engineering, design, prototyping, testing, procurement, manufacturing, controls, outbound logistics, etc.) with a network of digital communications
+ Operating and managing the manufacturing process by sending across the network and directly to the people, machines and processes all data and information needed to produce product (product designs, product specs, order quantities, inventory levels, etc.)
+ Managing the plant by collecting real-time management, operating, and performance data from the machines and processes (equipment status, quality measures, operating parameters, production levels, inventory levels, etc.)

External:
+ Connecting the manufacturing business, including the internal network, to customers and the supply chain with an external digital network
+ Receiving data through the network directly from customers and the supply chain, and feeding that data into the internal network, to help plan and execute the manufacturing process (product specs, inbound and outbound orders, delivery schedules, etc.)
+ Sharing management and operating data, as needed, with customers and supply chains (capacity, equipment status, order status, inventory levels, etc.)
+ Allowing an integrated customer-SMM-supply chain view of the end-to-end manufacturing system
Relevance to SME’s

ASSESSMENT:
+ Do you create data within your company?
+ If yes, what types of data do you create and how do you collect it? Examples might include machine data, bills of materials, production schedules, predictive maintenance schedules, warranty data, work orders, design analyses, and many others.
+ Do you exchange technical and/or business data regarding your products and processes with your customers and/or suppliers?
+ If yes, please specify data types if you know them. Technical data can include data about your products and your processes. Business data can include data about purchasing, logistics, estimating, financials, and other areas.
+ Are you being asked by your customers and/or suppliers to exchange technical and/or business data with them electronically?
However, the data suggests that significant investments will be needed in assets, infrastructure, and management culture before the IIoT’s full benefits will be realized.

David White, ARC Advisory Group
Jan 14, 2016
Digital Maturity Spectrum

**Level I: Disengaged**
- Limited knowledge of DM&D
- Believe it DM&D is not relevant e.g. because they make parts to customers’ prints
- Might be using Computer Aided Design (CAD) and/or Computer Aided Manufacturing (CAM) but likely no other software

**Level II: Basic**
- Some knowledge of DM&D with limited use; know they need to be implementing
- Customer(s) requiring suppliers to use 3D models and/or provide information requiring DM&D
- Competitors using DM&D and winning new business
- Might be using CAD and CAM, or other Manufacturing Execution System (MES), Manufacturing Resources Planning (MRP), Product Lifecycle Management (PLM) or some tools from the PLM suite or other Enterprise Resource Planning (ERP) software

**Level III: Intermediate**
- Understand and see the potential of DM&D
- Some use of DM&D directly or through 3rd party providers. Looking for assistance to expand use
- See a competitive advantage w/ existing or new customers in using DM&D services.
- Will be using CAD and/or CAM, may be using M&S/HPC, MES, MRP, PLM (or some tools from the PLM suite) or other enterprise software.

**Level IV: Intermediate**
- Understand DM&D business potential and are exploiting it & looking for the latest DM&D (M&S/HPC tools and/or APPs)
- Looking for a better way to acquire and use available DM&D solutions and/or services
- Already using M&S/HPC and/or APPs or could be interested in developing custom APPs
- Will be using CAD and CAM, M&S/HPC, may be using MES, MRP, PLM (or some tools from the PLM suite) or other enterprise software
- Will be using DM&D tools or are being supported by an ESP
- Will be interested in leveraging M&S/HPC thru DMC to improve their performance and reduce cost
The Fourth Industrial Revolution

But while the Industry Internet of Things (IIoT) may be revolutionary in concept, it will be evolutionary in adoption for most companies.
How to get engaged…

You do not have to become a DM&D expert, rather you need to understand it, know what data is valuable to your organization and leverage it.

Your DM&D focus needs to be on:
1) Critical organizational behaviors **(Culture)**
2) Decision-making using DM&D **(Business Decisions)**
3) Connecting to external expertise **(Software, tools and Engineering Service Providers)**
DMDII’s Workforce Development

MISSION + VISION AND CURRENT PROGRAMS

DMDII facilitates or provides the foundations required for effective DM&D workforce development, leveraging a network of partners and existing infrastructure across industry, education, government, and NGOs.

Workers & Students
Develop programs that prepare our existing and future workforce for jobs that leverage digital manufacturing & design technologies.

Members & Employers
Develop programs that define digital manufacturing technologies and the jobs that support them to aid both technology adoption and improve business’ productivity.

An Industry In Need
DMDII follows an inclusive approach to workforce development planning and programming.

+ Veterans
+ Women
+ Minorities
+ Immigrants
+ Disconnected Youth
+ Non-traditional Workers
+ Older Workers
+ Existing Workers
+ Future Workers
+ Dislocated Workers

Taxonomy Development
Provide Skills Classifications for Digital Manufacturing Jobs
This cross-industry project will result in workforce development programming that is demand driven for industry and educational partners. It meets the charge of the institute in addressing need where no one company is best positioned to lead alone.

DM&D-101
INTRODUCTION TO DIGITAL MANUFACTURING & DESIGN

INTRODUCTION TO THE DIGITAL THREAD
+ Digital Thread
+ Model Based Design
+ Model Based Enterprise

DIGITAL MANUFACTURING RESEARCH THRUST AREAS
+ Advanced Analysis
+ Intelligent Machines
+ Advanced Manufacturing Enterprise
+ Digital Manufacturing Commons
+ Digital Manufacturing Security
Program Structure

MEP Training and SMM Interaction

MEP Practitioners

MEP Training Workshop

- DMDII Institute Overview
- DM&D Overview & Impact
- Assessment Training
- Use Case Training
- Opportunity Identification
- Action Planning

Use Cases / Case Studies

Technology Use Cases/Studies aligned to Assessment Areas

Feedback from MEP Network

Feedback across the MEP network leads to additional Use Cases/Studies and refinement of technology adoption roadmaps

SMMs

Engagement & Assessment

Initial Assessment

Deep Dive Assessments

Understanding of Gaps and Opportunities

Action: Assistance & Project Plan for Company

- Design & Engineering Practices
- Digital Factory Floor / Mfg. Execution Practices
- Supply Chain Data Exchange
- Enterprise Support Operations
- Cybersecurity (Overlaps all Deep-Dive topics)

- • MEP Training Workshop
- • Use Cases / Case Studies
- • Feedback from MEP Network
- • Engagement & Assessment
- • Initial Assessment
- • Deep Dive Assessments
- • Understanding of Gaps and Opportunities
- • Action: Assistance & Project Plan for Company
- • DMDII Institute Overview
- • DM&D Overview & Impact
- • Assessment Training
- • Use Case Training
- • Opportunity Identification
- • Action Planning
- • Technology Use Cases/Studies aligned to Assessment Areas
- • Feedback across the MEP network leads to additional Use Cases/Studies and refinement of technology adoption roadmaps
- • Design & Engineering Practices
- • Digital Factory Floor / Mfg. Execution Practices
- • Supply Chain Data Exchange
- • Enterprise Support Operations
- • Cybersecurity (Overlaps all Deep-Dive topics)
What is DMDII
DMDII is a public/private partnership focused on digitizing manufacturing

Established in 2014 as part of the National Network for Manufacturing Innovation (NNMI) through a 5-year cooperative agreement with $70M in federal government funding and over $105M in matching funding from industry, academia, local government, and community partners.

Applied Research & Development
REDUCE COST AND RISK OF COMMERCIALIZING NEW TECHNOLOGY

Technology Integration & Commercialization
DEVELOP INNOVATIVE METHODS AND PRACTICES FOR SUPPLY CHAIN INTEGRATION

Education, Technical Skills & Workforce Development
ENGAGE WITH SMALL & MEDIUM-SIZED MANUFACTURING ENTERPRISES
Membership Snapshot

Collaboration Across Industry, Government, Academia, and Non-Profits

Industry Partners

- >270 industry partners from small businesses to large corporations
- $500B in annual industry revenues
- $25B in annual R&D spending by industry partners

Government Partners

- 17 government partners
- DMDII is funded through the Department of Defense

University Partners

- Dozens of nationally recognized subject matter experts
- >$75 million in co-investment available for research projects

World Class Industry Leaders

[Image of industry logos]

Governments & Agencies

[Image of government logos]

Leading Universities

[Image of university logos]
Partners + Projects

BY THE NUMBERS

$51.2M Awarded towards Projects

30 Awarded Projects

27 Projects Pending Award

1st Partner Innovation Project (PIP) was launched to initiate a member-sponsored project call on cognitive computing solutions for supply chain.

76 Unique organizations involved in research and development projects, 14 are located in Illinois.

40 Illinois-based organizations are a part of the 250+ members of the DMDII consortium

1st DMC Hackathon in 2016

6 Number of Project Call Workshops

2 DMDII Chapters being piloted in Illinois – Rockford and the Quad Cities. These outposts help connect the resources of DMDII to these manufacturing strongholds.

27 Projects Pending Award

6 Number of Project Call Workshops

Engaging with Partners with quarterly meetings, workshops and dinners

Number of Project Call Workshops

250+ members of the DMDII consortium

14 located in Illinois

27 Projects Pending Award

Engaging with Partners with quarterly meetings, workshops and dinners

2 DMDII Chapters being piloted in Illinois – Rockford and the Quad Cities. These outposts help connect the resources of DMDII to these manufacturing strongholds.

27 Projects Pending Award

6 Number of Project Call Workshops

Engaging with Partners with quarterly meetings, workshops and dinners

2 DMDII Chapters being piloted in Illinois – Rockford and the Quad Cities. These outposts help connect the resources of DMDII to these manufacturing strongholds.
The Facility

A PLACE TO COLLABORATE, RESEARCH, AND LEARN

Operating on Goose Island in Chicago, IL

94,000 ft² facility – home to the digital manufacturing lab, instructional & meeting spaces, + traditional office

24,000 ft² manufacturing floor with over $5 million in consigned equipment
The centerpiece of the UI LABS facility is a 24,000 square-foot manufacturing floor that showcases the machines and technology at the heart of DMDII’s mission to create a digital thread of technology across the manufacturing process, providing American manufacturers opportunities to harness data to make products better, faster and more cost-competitive.
What is our Research
Closing the Innovation Gap

- **Investment**
  - **Government & Universities**
  - **Private Sector**

**Gap**
- DMDII Core Project Areas (T4-T7)
- DMDII Technology Transition & Commercialization
- DMDII Deploy

**Technology Readiness Level**
- 1: Basic Tech Research
- 2: Research to Prove Feasibility
- 3: Tech Development
- 4: Tech Demonstration
- 5: System/Subsystem Development
- 6: System Test, Launch & Operations
DMDII projects address five technology focus areas

1. ADVANCED MANUFACTURING ENTERPRISE (AME)
   - Information systems integration throughout the product lifecycle.
   - Digital links between design and fabrication.
   - Smart factory and supply chain management.
   - Integration of smart sensors and controls to enable equipment to automatically sense and understand current production environment in order to conduct “self-aware manufacturing.”
   - Utilization of high performance computing to model materials, products and processes to enable “design with manufacturing in mind.”
   - An open source software platform that enables data aggregation, analysis, and action.
   - Industry and national needs for security, trust and IP protection within the manufacturing environment.

2. INTELLIGENT MACHINES (IM)

3. ADVANCED ANALYSIS (AA)

4. DIGITAL MANUFACTURING COMMONS (DMC)

5. CYBER PHYSICAL SECURITY
### Examples of Applied Technology Projects from the DMDII Portfolio

<table>
<thead>
<tr>
<th>Sample Project</th>
<th>Sample Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Real-Time Shop Floor Data Analytics:</strong> Bring mobile computing and advanced</td>
<td>• Reduce rework and labor costs by up to 30%; $1MM over the life of the vehicle</td>
</tr>
<tr>
<td>analytics to shop floor decision-making, allowing real-time</td>
<td>per hour saved in production</td>
</tr>
<tr>
<td>adjustments to complex vehicle system assembly</td>
<td></td>
</tr>
<tr>
<td><strong>Intelligent Machine “Plug and Play” Solution:</strong> Machine intelligence</td>
<td>• Reduce current 50% scrap rate by half</td>
</tr>
<tr>
<td>solution for adaptive machining, allows machines to adjust based on</td>
<td></td>
</tr>
<tr>
<td>unique shape of each cast/blank part, interoperable across CNC machines</td>
<td></td>
</tr>
<tr>
<td><strong>Next-Gen Product and Process Design:</strong> Design refresh of helicopter engine.</td>
<td>• Reduce total system cost by 10-15%; accelerate time to market</td>
</tr>
<tr>
<td>Advanced analytics and modeling software: compare as designed, as made,</td>
<td></td>
</tr>
<tr>
<td>as assembled, as serviced data. Cloud-based collaboration for real-time</td>
<td></td>
</tr>
<tr>
<td>exchange and co-design</td>
<td></td>
</tr>
</tbody>
</table>
Open Project Calls

COLLABORATIVE RESEARCH OPPORTUNITIES

DMDII-16-03
Seamless Work Flows from Design to Fabrication
Develop software solutions that significantly reduce the manual input and expertise required to rapidly translate designs into fabricated parts during manufacturing, fully utilizing the capabilities of available machine tools.

DMDII-16-04
Real Time Optimization of Factory Operations
Improve factory decision-making by transforming raw data into meaningful and useful information for analysis and decision making. Proposed tools include online analytical processing, data mining, complex event processing, text mining, predictive and prescriptive analytics, and active performance management across multiple systems.

DMDII-16-05
Low Cost Robotics and Automation
Robotics and automation solutions that are affordable, reconfigurable, and adaptable, and that exhibit the precision, repeatability, and productivity of conventional automated solutions. They must also exhibit flexibility at a cost that makes them accessible to small and midsize businesses.

DMDII-16-06
Human Systems Integration
Develop digital and physical technologies to improve human systems integration and human centric design to reduce the inefficiencies that stem from industrial workers performing tasks in environments that do not adequately take into account human size variation or capabilities.

Learn more at: dmdii.uilabs.org/projects
Current Research Reach

COLLABORATIVE RESEARCH JOINING ACADEMIA, INDUSTRY AND SMALL BUSINESS

SAMPLE of PROJECTS & LEAD ORGANIZATIONS

- Integration of AVM IFAB Tools for Industrial Use: Applied Research Laboratory, Pennsylvania State University
- Elastic Cloud-Based Make: GE Global Research
- Assessing, Remediating, & Enhancing DFARS Cybersecurity Compliance in Factory Infrastructure: Impinj, Inc. (2)
- Advanced Variance Analysis & Make: Rolls-Royce Corporation
- Supply Chain MBE/TDP Improvement: Rolls-Royce Corporation
- O3 – Operate, Orchestrate & Originate: STEP Tools, Inc.
- Structural Composites – Blade Multidisciplinary Design and Analysis: Green Dynamics Inc.

$51.2 Million in Active Contracts across 30 R&D Projects involving 76 Unique Organizations

$37.3 Million in pipeline pending review across 27 R&D Projects and involving an additional 80 Unique Organizations
Opportunities to get involved in Projects

Now + Get involved on a team – serving as a test bed or demo

Now + Provide feedback on usability of a product e.g. GE creating a low cost product (Geometric Adaptive Toolkit) and could have used more SMM’s to test.

Q2 2017 + Digital Manufacturing Commons – we will transition tools into the DMC, to establish a framework for SMM’s, to gain access to the powerful modeling, simulation, and analysis tools. Providing a viable, low-cost means of accessing design-to-manufacture tools.
The Digital Manufacturing Commons (DMC) is an open-source software project to develop a collaboration and engineering platform to enable plug-and-play functionality across the entire digital thread from product development to manufacturing and services.

DMC is a suite of software and services with three components:
- Open Architecture Software Platform
- Apps Marketplace
- Professional Services
For more information, please contact:

Colette Buscemi
Director, Programs
Colette.Buscemi@uilabs.org

Thank you!