Request for Proposal

DMDII-17-01
Digitally Enabling the Supply Chain

Technology Thrust Area: Agile, Resilient Supply Chain

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## 1 Record of Change

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<th>Version</th>
<th>Date</th>
<th>Sections</th>
<th>Description</th>
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<tr>
<td>1.0</td>
<td>4-August-2017</td>
<td></td>
<td>Original</td>
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2 Project Call Purpose
Digital Manufacturing and Design Innovation Institute (DMDII) Request for Proposals are issued to address research and development needs in digital design and manufacturing technology that are aligned with the technical objectives of the DMDII (also referred to as the Institute). This Request for Proposal (RFP) is a description of a specific technology objective. A separate document, the Proposal Preparation Kit (PPK), offers detailed instructions for the Proposal development, format and submission instructions. The Proposal Preparation Kit (DMDII_17-01_and_17-02_Proposal_Preparation_Kit_(PPK)_1.0_8.4.2017) can be found here.

2.1 Key Dates

<table>
<thead>
<tr>
<th>Phase 1 Key Event Dates</th>
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<tr>
<td>Request for Proposals released</td>
<td>August 4, 2017</td>
</tr>
<tr>
<td>All Project Participants are DMDII Members</td>
<td>October 2, 2017</td>
</tr>
<tr>
<td>Technical and Cost Proposals due</td>
<td>October 2, 2017</td>
</tr>
<tr>
<td>Selection notices provided</td>
<td>October 31, 2017</td>
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<table>
<thead>
<tr>
<th>Phase 2 Key Event Dates</th>
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<tr>
<td>Initial review of Enterprise Award Agreement</td>
<td>November 20, 2017</td>
</tr>
<tr>
<td>All clarifications/negotiations on SOW and Cost Proposal complete</td>
<td>November 20, 2017</td>
</tr>
<tr>
<td>Project Awarded</td>
<td>December 19, 2017</td>
</tr>
<tr>
<td>Project Kickoff Meeting</td>
<td>January 19, 2018</td>
</tr>
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</table>

*Phase 2 Dates are Estimates*

2.2 Submission Information

Each project team which is planning on submitting a Proposal to this Request for Proposal must submit their Technical Proposal and Cost Proposal no later than 12:00PM Central Time, October 2, 2017.

All Submissions should be made electronically to DMDII@uilabs.org. Please include the RFP designation (e.g., “DMDII-17-<xx> – <RFP Title> - <Offeror Name> - <Proposal Title>”) in the subject line of the email.

3 Project Evaluation Criteria

DMDII’s primary goal is to apply digital manufacturing technologies to solve business problems. To this end, successful proposers must demonstrate an understanding of both the business needs as well as the technology solutions. Proposals should provide a crystal clear explanation of the problems that are to be solved, and how the project success will benefit the manufacturing organizations.

Each Proposal is evaluated by a specific set of criteria. The PPK defines a general list of Technical Proposal evaluation criteria, all of which are applicable to this RFP.
4 Request for Proposal Summary

Industry has long expressed interest in the use of model-based methods and digital thread capabilities to unlock breakthrough productivity improvements across the supply chain. The automation of critical information flows such as exchange of product and procurement data and reporting of key quality measures, can enhance supply chain visibility and improve performance of the overall enterprise. Within the manufacturing industry, however, there is a large majority of parts produced prior to advancement in digital capabilities. These legacy parts present a unique challenge with non-relational 2D documents and separate manufacturing specs currently stored in fragmented, non-standard formats which prevent digital transmission across the supply chain. This is in comparison with greenfield (new development) products where there is an opportunity to comply with model based definition techniques from concept to end-of-life. Legacy parts and supply chain operations present barriers to practically realizing the benefits of digital technologies, including those enabled by model based definition, and despite significant investment in technologies, standards, and tools, the utilization of digital methods in the supply chain remains fragmented.

This project call seeks to create a roadmap and set of playbooks -- minimally one for Original Equipment Manufacturers (OEMs) and one for Small/Medium Manufacturers (SMMs) -- to guide the implementation of digitally-enabled supply chain practices and technologies. Successful projects will examine and define the current state and desired state of digitally-enabled supply chain practices and technologies across the design and manufacture supply chain, including networks comprising both large OEMs and SMMs. The team should work directly with SMMs and OEMs to identify their pain points and current practices to evaluate high impact supply chain practices and identify crucial information flows to identify on a roadmap the high-value gaps in technology that are preventing the realization of a digitally enabled supply chain. The team should identify the financial incentives for organizations to implement the specific steps within the playbooks to help further the adoption of the playbooks themselves. The team will need also need to review the current state of model-based technology solutions and standards such as STEP AP242, STEP AP203, STEP AP214, JT, and QIF that may affect how data is created, transferred and consumed by entities within the supply chain. Additionally, projects should take into account both legacy and greenfield products. Projects should evaluate high impact supply chain practices and identify crucial information flows supporting those to define a digitally-enhanced roadmap that makes maximum use of available
technologies, tools, and standards for information exchange.

Projects should consider recent and ongoing research at DMDII (see list below) and other relevant projects from DoD, NIST and standards organizations, to identify opportunities to leverage, connect or complement these projects with new research that will bridge the gap between the current and desired state. Serious consideration must be given to real-world constraints among the SMM community, including limited access to technology and working capital due to the very high degree of business fragmentation, nearly non-existent R&D budgets, and very thin operating margins. Successful proposals will plan to take these conditions into account to propose a set of follow-on project calls that aim to fill the high-value gaps in the roadmap and unblock the largest OEMs to the smallest SMMs from reaping the productivity benefits of digital model-based technology.

The team should leverage current and previous project efforts that affect the data flow within a supply chain, to assist in connecting the dots to formulate recommendations and the roadmap. A few of such efforts are:

- DMDII 14-06-01: Supply Chain Model Based Enterprise and Technical Data Package Improvement
- DMDII 14-08-01: Integrated Design and Manufacturing Models with Metrology
- DMDII 14-10-01: AVM Standards Development and Promulgation
- DMDII 14-02-02: Mind the Gap – Filling the Gap between CAD and CNC with Engineering Services
- DMDII 15-11-08: Capturing Product Behavioral and Contextual Characteristics through a Model-Based Feature Information Network
- DMDII 14-06-05: Operate, Orchestrate and Originate (O3)
- DMDII 14-01-10: Elastic Cloud-based Make
- DMDII 15-16-02: Democratizing the Model based Domain from Design to Verification: Automatic Generation of Optimized CMM Programs on the DMC
- Information sharing and exchange in the context of product lifecycle management: Role of standards
- Analysis of Standards for Lifecycle Management of Systems for US Army --- a preliminary investigation

In developing the roadmap and playbook of recommendations for digital technology implementation, the team should analyze what organizations (SMMs and OEMs) can reasonably accomplish given the practical constraints. Teams can then develop playbooks of steps for large and small organizations to create a digitally enabled supply chain. The playbooks should be developed in a fashion to increase accessibility and ease of integration into the Digital Manufacturing Commons.

The roadmap and playbook shall aim to address the pain points identified by DMDII industry members. Such use cases which address these pain points include but are not limited to:

- As a supply chain manager, I want to have suppliers confirm they have the latest specification or drawing to make sure they are shipping the correct part.
As an OEM supply chain manager, I want one location where any supplier submits documents so I can easily retrieve them with no duplication of data entry and so approval workflow is visible.

As an SMM I want to provide feedback on new parts so I can help and OEM reduce their part costs and streamline manufacturing.

A successful project team will have the following representation:

- Original equipment manufacturers (OEMs)
- Small & medium manufacturing organizations (SMMs)
- Software providers
- Model based definition subject matter experts
- Supply chain subject matter experts

Project Deliverables:

- A roadmap for methods, standards and technology implementation and adoption for SMMs and OEMs to create a more efficient supply chain through the utilization of model-based methods. The roadmap should minimally include:
  - Baseline of the current state of digital supply chain practices and extent of information exchange in support of that, including standards and tools
  - Identification of the desired state for industry at large
  - Gaps identified and necessary steps to get to the desired state
  - Solutions for handling legacy product data and new product data
- A playbook for SMMs listing recommendations and prioritized steps in the current context/reality for SMMs to incrementally realize the future model-based supply chain and to traverse the roadmap created by this project.
- A playbook for OEMs listing recommendations and prioritized steps in the current context/reality for OEMs to incrementally realize the future model-based supply chain including legacy parts and to traverse the roadmap created by this project.
- Technology development recommendations for future DMDII projects based on identified gaps and the unique assets available through the membership consortium.

DMDII anticipates choosing one team to complete this project, however, we reserve the right to work with the proposing teams to modify scope and readjust the project teams to best suit this effort. DMDII anticipates working directly with each of the team members to manage scope, timeline, contracting, etc.

5 Project Requirements

5.1 Travel Requirements

Proposals should include funding for three trips per year for two people for presenting to the DMDII membership. These trips may be for travel to UI LABS or to another location at the request of DMDII (e.g., a conference, workshop, showcase, etc.). For estimation purposes, use Chicago, IL as the
destination.

5.2 Period of Performance Requirements
Proposed projects should be no more than twelve (12) months in duration. Please note that projects are initiated once an Enterprise Award Agreement is signed, therefore, the project duration must include the subcontracting of all project participants between the Lead Organization and the Project Participants.

5.3 Funding Requirements
The DMDII anticipates awarding 1-2 projects for up to $500,000 per project, not inclusive of expected cost share, under the DMDII-17-01 RFP. Final award amounts will be adjusted accordingly based on Proposals received and subsequent evaluations. This project requires a minimum 1-to-1 Cost Share in aggregate by each Offeror team.

6 Request for Proposal Questions & Answers
Interested parties may submit questions to DMDII@uilabs.org. All new questions and answers received may be posted here.