



The Digital Manufacturing Institute

# **MxD REQUEST FOR PROPOSAL TECHNICAL SUMMARY & PROGRAM OVERVIEW**

## **MxD-20-04: Getting Started and Maximizing Your ROI From Digital Manufacturing As A Small Manufacturer**

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## I. RECORD OF CHANGE

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Revision	Date	Sections	Description
1.0	09 April, 2020	N/A	Original

## II. PROJECT OVERVIEW

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Deadline for Submitting Interest in Teaming	5PM CT - 14 May, 2020
Proposals Due	5PM CT - 08 July, 2020
Anticipated MxD Funding	Up to \$250,000
Period of Performance	8 - 12 months

## III. INTRODUCTION

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MxD: The Digital Manufacturing is where innovative manufacturers go to forge their futures. In partnership with the Department of Defense, MxD (also referred to as the Institute) equips U.S. factories with the digital tools and expertise they need to begin building every part better than the last. As a result, our nearly 300 members increase their productivity and win more business.

MxD has invested approximately \$90 million in more than 60 applied research and development projects in areas including design; product development; systems engineering; future factories; agile, resilient supply chains; and cybersecurity.

MxD operates from a nearly 100,000-square-foot innovation center near downtown Chicago. Its factory floor features some of the most advanced manufacturing equipment in the world, which partners can use for experimentation and training on everything from augmented reality to advanced simulation techniques.

MxD Request for Proposals (RFP) are issued to address research and development needs in digital design and manufacturing technology that are aligned with the technical objectives of MxD and directly support the Institute's vision of developing digital manufacturing systems that make every part better than the last.

This RFP contains the following elements:

1. Request for Proposal Technical Summary & Program Overview: a description of a specific technology objective and technical and program requirements
2. Proposal Preparation Kit (PPK referenced as the Kit): includes a PPK overview document and attached proposal templates and references. The PPK Overview provides background and guidance for the preparation of required forms and instructions needed to submit to a MxD Request for Proposal. The PPK Overview offers detailed instructions on how to respond to this RFP and provides attachments with the required proposal templates. It is intended to provide the basic information necessary for

assembling complete and compliant proposals and to help explain those areas that usually generate the most questions from Offerors.

**NOTE: MxD recommends Offerors review the Request for Proposal Technical Summary & Program Overview prior to the PPK.**

The RFP is available on the MxD website at <http://mxdusa.org>. Notices announcing MxD competitions and due dates will also be posted on the MxD website. Amendments to a MxD RFP may be used to extend due dates, clarify procedural requirements or modify technical requirements. An updated RFP may be issued, and the previous RFP will be rescinded. Offerors should carefully monitor the MxD website subsequent to an original posting of an RFP, up to the time of the Technical Proposal and Cost Proposal submission date. Any revisions, amendments or updates will appear in the same section of the website as the original solicitation. It is the responsibility of the Offeror to monitor the MxD RFP updates and ensure their proposal meets the solicitation requirements. MxD welcomes any comments or suggestions for improving the contents of this guide. Please address them to [projects@mxdusa.org](mailto:projects@mxdusa.org).

Any questions regarding this solicitation must be provided to [projects@mxdusa.org](mailto:projects@mxdusa.org). The questions will be sent to the appropriate MxD and/or Government POC, and answers will be published on the MxD website, if appropriate. Questions submitted within one week prior to a deadline may not be answered.

#### **IV. PURPOSE**

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MxD will periodically solicit proposals for applied research and technology development to meet the goals outlined in its Strategic Investment Plan (SIP) or complementary goals specified by key external stakeholders that align with MxD's core mission. The process by which this achieved is through an RFP.

An RFP is initiated when MxD desires new and creative solutions to problems and/or advances in knowledge, understanding and technology for digital manufacturing and design. The purpose of an RFP is to solicit proposals for projects in technology areas that are of interest to MxD membership and external stakeholders such as the U.S. Government. MxD will initiate and coordinate development of the RFP topics by engaging Technology Advisory Committee (TAC) members, MxD's Technical Call participants, Department of Defense (DOD) affiliates, and other relevant stakeholders. Once the RFP topics are developed and approved the MxD RFP will be posted to the MxD website and represents the official notification to Offerors of a request to submit the required documents.



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# REQUEST FOR PROPOSAL TECHNICAL SUMMARY





## V. TECHNICAL SUMMARY

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### PROBLEM STATEMENT

MxD is preparing to release a Request for Proposals to help accelerate the adoption of digital manufacturing technologies among small and mid-sized manufacturers (SMMs). According to the US Census Bureau, 98% of the approximately 250,000 manufacturing organizations in the United States have less than 500 employees. Of that 98%, approximately 75% of the companies have less than 20 employees.<sup>1</sup> Thus, when it comes to maximizing the competitiveness and resiliency of the US manufacturing base, it is critical that smaller organizations are not left behind. Unfortunately, when it comes to Industry 4.0 and the promises of digital manufacturing, most of the buzz is directed towards larger manufacturers that have the capital to make large investments in technology. Currently, we are seeing a sustained effort by larger manufacturers to embrace digital manufacturing, but this is not the case among their supply base. According to BMO US, only 5% of mid-sized manufacturing organizations have implemented digital manufacturing technologies.<sup>2</sup> The technology gap between Original Equipment Manufacturers (OEMs) and SMMs will continue to widen unless there is a concentrated effort to provide the resources and technologies that are needed to help small and mid-sized organizations get started and maximize their returns on short and long-term digital manufacturing investments.

There is no question that implementing digital technology can lead to substantial returns for a company's bottom line if applied correctly. The internet is riddled with success stories from larger manufacturers that capture how technologies like the Industrial Internet of Things, automation and model-based engineering tools are reducing costs, maximizing productivity and allowing manufacturers to build better quality parts for their partners. Even with this success, there is still a gap in translating these stories into a format that also motivates small and mid-sized manufacturers to employ new technologies to increase their competitiveness. According to research by a former MxD-funded project team led by Auburn University, the greatest barriers to adoption are a lack of understanding and misperceptions.<sup>3</sup> The existing resources in the public domain may help broaden the awareness of digital manufacturing and its potential, but they do not provide the end-to-end visibility of the implementation process needed to de-risk investment and instill confidence digital manufacturing can positively impact the bottom line. Thus, for most companies, there is still a considerable amount of due diligence needed to leverage past learnings and take action in the digital manufacturing space. The question many SMMs are asking is "Where should I get started and what steps should I take to maximize my ROI in digital manufacturing technology?"

To answer this question, MxD seeks to fund a team to develop the resources SMMs need to create a strategy for investing in the right technology at the right time, launch effective digital manufacturing initiatives, and ultimately de-risk their journey to realizing a return on their investment in digital manufacturing technologies.

<sup>1</sup>US Census Bureau's 2017 SUSB Annual Data Tables by Establishment Industry. (2020, April 3).

<sup>2</sup>Industry 4.0: Redefining How Mid-Market Manufacturers Derive and Deliver Value. (2019, March). Retrieved April 7, 2020, from <https://www.bdo.com/insights/industries/industry-4-0/industry-4-0-redefining-how-mid-market-manufacture>

<sup>3</sup>HARRIS, G., YARBROUGH, A., ABERNATHY, D., & PETERS, C. (2019). MANUFACTURING READINESS FOR DIGITAL MANUFACTURING. MANUFACTURING LETTERS, 22, 16–18. DOI: 10.1016/J.MFGLET.2019.10.002



## OBJECTIVES AND CRITICAL REQUIREMENTS

**The following objectives outline the key activities that MxD considers essential for a successful project. MxD's recommended set of requirements are included under each objective, but the team is encouraged to make value-added changes to the requirements as they see fit.** These changes should be justified in their proposal. Additionally, it is not MxD's intention that these objectives are completed in the order that they are detailed below. MxD encourages agile development on its projects to ensure that the deliverables are shaped and validated by customers and key stakeholders throughout the period of performance.

Additionally, teams are not expected to provide an all-encompassing solution that covers the entirety of the digital manufacturing space and all the manufacturing segments. This is unrealistic. Teams are expected to focus their proposals to a scope that is realistic, achievable and aligned with their unique subject matter expertise. A wider range of expertise is preferable to MxD, but teams will be evaluated based on their proposed approach and its potential impact in accelerating adoption among SMMs.

The key objectives are defined below:

1. **Understanding the Landscape:** Conduct primary and secondary market research to develop a deep understanding of the needs of the SMM market and help direct the outcomes and requirements for the following objectives.

As with all product development, it is key that there is a customer need behind every development decision. MxD encourages the team to leverage existing work and research where possible. Although this phase is focused on gathering a deep understanding of the needs of the SMM market, teams should not rely entirely on this activity to shape their work. Instead, competitive teams will submit well-thought out proposals that already have a strong approach defined and this phase will be used tactically to refine that approach, validate hypotheses and fill any gaps.

The requirements for this objective are as follows:

- Team should target an industry segment where they can make considerable impact and produce resources that benefit SMMs. It is preferred that the team makes a large impact in a segment they know deeply rather than attempt to boil the ocean with limited success.
  - Team should leverage existing work where possible. Ideally, this team can leverage the work done by the MxD 17-01-01 team in their "Digitizing the Supply Chain" project.
  - Team should conduct a minimum of 25 interviews with key stakeholders to develop deliverable requirements and validate their transition plan.
  - The research in this stage should be shaped to further refine the team's proposed methodology for the "How To Get Started" Resources in the next objective and de-risk their approach.
2. **Development of "How To Get Started" Resources:** Develop user-friendly, actionable resources to accelerate a manufacturer's ability to be confident getting started in digital manufacturing.



There is a lot of upfront research, strategizing and analyzing that needs to take place when a manufacturer decides to make their first steps into digital manufacturing. With the massive landscape of digital capabilities and solutions currently available, SMMs require a tailored way of thinking in order to identify the practical opportunities and problem areas that are best-suited to tackle first.

The requirements for this objective are as follows:

- Develop a methodology and supporting templates for analyzing a manufacturing system and prioritizing the highest-value opportunities and biggest problem areas that have a proven business case and make a practical start for digital manufacturing investment.
- For each identified problem and opportunity area, the team should highlight key prerequisites that need to be in place before considering digital technology, the estimated ROI, and what downstream opportunities are unlocked through investment in this area.
- Develop a framework and template that can be used to understand the estimated costs, intangible returns and tangible returns associated with different digital manufacturing investments for the high-value opportunity/problem areas. Exact return on investment is impossible to predict, but there needs to be upfront confidence that digital manufacturing can improve quality, efficiency, productivity, sales, safety and/or profitability. The impact to the bottom line must be clear.
- Develop a methodology and template for creating a digital manufacturing investment roadmap.
- Provide guidance on the questions that need to be asked to properly benchmark solutions and assess prospective vendors.
- Teams are encouraged to build their resources to leverage existing digital manufacturing readiness assessments where possible. Ideally, these resources are a natural next step for manufacturers to use after an assessment is completed

The resources should supplement each other and be organized in a logical manner so that the SMM can navigate from resource to resource intuitively and utilize them easily. They should provide the SMM with an answer to the question of “Now what?” at each step of the pre-implementation process.

3. **Development of a “Digital Manufacturing Starter Kit”:** Develop a SMM-friendly collection of digital manufacturing projects for the highest-value use case(s) for your target manufacturing segment. The projects should be quick, easy, affordable and based on low-cost, highly recommended, commercial or open-source technologies.

The requirements for this objective are as follows:

- The toolset should consist of project(s) that target one or more of the high-value problem areas or opportunity areas identified in the second objective. It is important teams identify high-value problems first and then target solutions.
- The toolset projects should consist of Industry 4.0 solutions in one or more of the following technology areas:



- Automation
  - Internet of Things and Connectivity
  - Manufacturing Execution Systems (MES) and Enterprise Planning
  - Data Analytics
- Proposals that address multiple problem or opportunity areas are preferred. However, this is not a strict requirement. Teams that only focus on one problem or opportunity area but have considerable depth in their proposal and showcase significant impact will be competitive as well. Thus, teams should focus in the areas that they are confident that they can make a substantial impact in.
  - The projects should have a proven capability of serving small and mid-sized manufacturers and notoriety for being a leader in serving that segment.
  - This RFP is not targeting early stage technology that has yet to be validated in a production environment. The goal is to identify a set of projects that already have shown success in the manufacturing environment.
  - It is preferred that the project support integration across the toolkit to eliminate a fragmented approach.
  - For all projects in the starter kit, the team should highlight all prerequisite technology, infrastructure, expertise, budget, etc. that is needed to carry out successfully
  - The starter kit should include documentation needed to successfully plan for, implement, execute and sustain the solutions.
4. **Implementation at SMM(s) Testbed:** Implement the developed “How To Get Started” resources and the “Digital Manufacturing Starter Kit” at one or more SMM sites to test the developed resources in action.

The requirements for this objective are as follows:

- The team should document the implementation diligently.
  - Manufacturers should be interested in serving as a case study to better inform the rest of the supply base.
  - SMMs should and should have an identified need for the resources being developed on this project. SMMs that have yet to invest in digital manufacturing or that are in the very early stages of investment are preferred.
  - SMMs should work closely with the team throughout the project to offer a customer perspective and help shape the deliverables.
  - The implementation should include the proper training and support for the SMM.
5. **Generation of Detailed Case Studies:** Create detailed case studies that shed light on the implementation, provide best practices, discuss lessons learned and depict the tangible and intangible return on investment.

MxD seeks to fund the creation of these case studies to provide additional success stories to inspire other manufacturers to take practical steps into digital manufacturing. The goal is to shed light on the process to help the readers avoid common mistakes and prepare their own implementations for success.

The requirements for this objective are as follows:



- Detail the key steps towards implementation to help the reader understand what to expect.
- Detail the best practices that were identified during the implementation.
- Describe all lessons learned that would help readers avoid mistakes and streamline their own future implementations.
- Provide insight on ROI, by comparing previous, current and future state. There should be a detailed analysis of costs (excluding proprietary information) and the impact to success metrics including but not exclusive to quality, efficiency, productivity, profitability, etc. Time to value and intangible impacts to the workforce should also be captured.
- Include best practices for mitigating risk for technology deployment.
- Protect proprietary information through anonymization as necessary.
- Detail the change management process and the experience with engaging the workforce and proactively managing resistance.

**6. Transition the Outcomes:** Develop a transition strategy and refine the deliverables so that they can be distributed broadly to maximize their impact.

MxD envisions that the team will work collaboratively with support from MxD to ensure that their work will transition past the project period of performance and be distributed broadly to truly benefit SMMs.

The requirements for this objective are as follows:

- The team must develop a strategy for distributing their outcomes to all members of the MxD membership base. Proposals should outline the team's high-level transition strategy and describe their unique qualifications that enable the team to execute this strategy.
- The project deliverables (not including commercial technology solutions) should be neutral in branding, be developed from an educational perspective and avoid being a vehicle for sales. MxD plans to support the team in raising awareness for their work and distributing the outcomes to institute's membership base.
- The deliverables should be designed and written in a way that clearly communicates the value of recommended actions and are easy to understand and use for the layman.
- Deliverables should be submitted in a package that is intuitive to navigate and use.
- Competitive teams will have participation from one or more Manufacturing Extension Partnership (MEP) centers that are interested in utilizing the outcomes to further serve their clients in digital manufacturing needs after the project. Teams that do not have contracted participation from the MEP network should at the minimum have a plan to consult with the network throughout the period of performance.
- The transition strategy should include a mechanism to track and quantify impact to the US manufacturing base (i.e. number of SMMs getting started in digital



manufacturing). Proposals should provide an initial set of metrics that will be used to quantify the impact during and post-project.

Through the completion of these objectives, this project seeks to satisfy the following use cases:

*As the owner of a small machine shop, I need the resources to understand what digital manufacturing technologies I need to implement to stay competitive and how to invest in them to maximize my ROI in the short and long term.*

*As a production manager at a small manufacturer, I want to launch a low-cost, practical, Industry 4.0 project and understand how to pitch it, plan it, execute it and then scale it.*

*As a consulting engineer at a MEP Center, I want the resources that will help my clients get started in digital manufacturing and invest confidently.*

### **RFP SCOPE OF WORK**

The above objectives must be completed within the following project constraints:

**Period of Performance:** 8 – 12 months

**Anticipated MxD Funding:** Up to \$250,000

During the period of performance, the team should perform initial market research to gain a deeper understanding of the needs of the industry to de-risk their approach, further refine the requirements for their deliverables and source any existing material that should be leveraged on the project.

The development process should employ agile methodology. Thus, the team should have active engagement from SMM and MEP partners throughout the period of performance to ensure the development is headed in a value-added direction. The team should avoid developing finished deliverables and then testing them via implementation. Instead, minimum viable products should be developed, validated and then refined in the implementation phase.

The team should develop the “How To Get Started” resources and validate them with the small manufacturers on the team and get additional feedback from external sources. The guide should be implemented by the manufacturer and lead to the implementation of one or more of the technologies selected for the “Digital Manufacturing Starter Kit”. The implementation should commence between the SMM and the service provider, but all parties should be diligently observing, documenting and reflecting on how this experience could be captured and shared with other manufacturers to ease their concerns and inspire adoption. The entire process from the use of the “How To Get Started” resources to the implementation of the starter kit technologies should be documented in the required case studies. Thus, these case studies should have an end to end view of what it takes to go from investment strategy to implementation. Special attention should be given to how to de-risk the process, best practices observed along the way, lessons learned, and most importantly, identify the tangible and intangible returns on the investment.

During the period of performance, the team will produce deployable deliverables that will be shared with the MxD membership in accordance with the Membership Agreement. The recommended deliverables are listed below in Table 1, but the team is encouraged to include



additional deliverables or provide value-added changes to the recommended set of deliverables as they see fit. **As the team defines their deliverables, they should keep in mind that the outcomes should be above and beyond what any one organization can produce alone. They should fill a gap in industry and truly represent the mission of using federal funding to advance the state of US manufacturing.**

**IMPORTANT:** If changes are made to the deliverables, the team must provide the reasoning and detail any assumptions to provide context for the changes. Their proposed set of deliverables must align with MxD’s focus on creating resources that will help accelerate the adoption of digital manufacturing amongst small and medium manufacturers.

**Table 1.** Technical Deliverables

<b>Deliverable</b>	<b>Description</b>
<b>How To Get Started Guide</b>	A guide that lays forth a methodology for getting started in digital manufacturing and is a collection of the necessary resources, templates and instructions to do so.
<b>Digital Manufacturing Starter Kit</b>	A collection of low-cost, easy to use, commercial or open-source projects/technologies/solutions that have been proven successful among small manufacturers.
<b>Implementation at SMM Site(s)</b>	Implement the “How To Get Started” guide and the tool(s) in the starter kit at a SMM(s) site to validate their effectiveness.
<b>Detailed Case Studies</b>	A collection of case studies providing a detailed account of the implementation with a focus on best practices and lessons learned.

The team is expected to develop a transition plan, which is detailed in Table 2 in Section VI. MxD is focused on supporting the transition of project outcomes to its membership and the broader industrial base. Teams are expected to tailor their deliverables to their transition goals in order to provide outcomes that have continuing impact after the period of performance is complete. **Actionable transition plans are a priority for MxD to help maximize the benefits of funded research to the membership and ultimately, help increase the competitiveness of the US manufacturing base through new technological advancements. Thus, it is important that proposals emphasize not just technical merit but transition strategy.**



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# PROGRAM OVERVIEW





## VI. PROGRAM REQUIREMENTS

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### COLLABORATION

Participation in this program requires collaboration with a team of organizations with diverse capabilities. Competitive teams should include representation from the manufacturing base, the Manufacturing Extension Partnership (MEP) centers, solution and service providers. It is critical that team understands that the goal of MxD projects is to bring together organizations to fill a gap and develop solutions that no one organization could develop alone.

Each team must include participation by at least one small and medium manufacturer. The manufacturer should be the testbed for the technology implementation and provide a customer perspective during the development of the project outcomes. The team should be actively engaging with additional small and medium manufacturers outside of the official project team to get additional feedback from industry and ensure that their work is headed in a value-added direction. For example, one method of accomplishing this is via an informal advisory board of SMMs that will participate in reviewing the project deliverables as they progress.

Although not the target consumer of the proposed project deliverables, MxD Tier 1 or Tier 2 Manufacturing member are encouraged to participate if they can actively involve their supply chains in the project.

Teams are encouraged to seek participation from one or more MEP centers to help develop and transition the outcomes. The goal of this project is not just to provide resources to SMMs looking to get started in digital manufacturing, but also to equip the MEP centers to help facilitate and provide services to accelerate adoption.

Teams are encouraged to have appropriate representation from subject matter experts in the digital manufacturing space. These organizations can be technology or service providers that have considerable amount of experience in selecting and implementing digital manufacturing technology within small and medium-sized enterprises. Both technical and strategic expertise is needed to prepare the educational resources, complete the technology implementations and document the journey in a way that instills confidence in other manufacturers looking to do the same.

Since these deliverables will be distributed broadly, teams are encouraged to involve their marketing or communications teams in the development of the deliverables to ensure they are professional, easy to use and effective.

### PROGRAM MANAGEMENT

MxD will be responsible for managing the project to ensure their team will meet all the technical objectives and requirements proposed within the project's period of performance and budget. The MxD Project Engineer will coordinate with Principal Investigators (PIs) of every participant to manage the program following MxD's project processes. The Director of R&D Projects, in coordination with each project's MxD Project Engineer, will monitor technical and cost performance of the associated Enterprise Award Agreement. Project teams will submit the reports listed below to their identified Project Engineer to fulfill their reporting requirements. These reports will be internally accessed by the MxD Director of R&D Projects, the Government, the Project Engineer and other authorized MxD staff members in the course of their official duties. Technology advancements will be summarized at least annually in order to support



reporting to the Executive Committee, Technical Advisory Committee, MxD Members, and the Government, when applicable.

<b>Deliverable</b>	<b>Description</b>
<b>Project Immersion Workshop</b>	Face to face meeting with manufacturer(s) including stakeholders from key business units to review project transition plan and define pilot requirements.
<b>Transition Plan</b>	Written plan for successful transition of project outcomes after period of performance including distribution, follow-on efforts and potential commercialization.
<b>Monthly Technical and Financial Reports</b>	Monthly report from each Project Participant including the financial and technical status of the Project
<b>Member Technical Reviews</b>	Presentation encompassing all technical advancements made prior to key milestone and presented to the MxD Project Engineer, members of the Technical Advisory Committee, and other interested MxD members.
<b>Presentations at MxD</b>	Presentation and demonstration of developed technology presented in person at MxD
<b>Annual Patent Reports</b>	Report of inventions and subcontracts
<b>Intellectual Property Reports</b>	Participants must promptly notify the MxD Project Engineer apprised of Project IP created, filing status, claims against the Project IP, and BIP licensed to other Members.
<b>Safety Accident/Incident Report</b>	Participants must report any major accident/incident (including fire) resulting in any one or more of the following situations: one or more fatalities or one or more disabling injuries; damage of Government property exceeding \$10,000; impact to Project planning or production schedules or degradation of the safety of equipment under contract. Such report will also identify potential hazards requiring corrective action.
<b>Draft Final Technical Report</b>	Draft report must include a comprehensive, cumulative, and substantive summary of all technical advancements and significant accomplishments achieved during the project.
<b>Final Technical Report</b>	See above
<b>Project Team Lead Release</b>	Release by Project Team Lead confirming scope of work to be complete
<b>Property Report</b>	List of all MxD funded equipment and planned disposition
<b>Final Patent Report</b>	Report of inventions and subcontracts

### **TRAVEL REQUIREMENTS**

Proposals should include funding for six (6) trips per year for two (2) people for each Offeror organization. These trips will be used for face to face meetings and presenting to the MxD membership. These trips may be for travel to MxD or to another location at the request of MxD (e.g., a conference, workshop, showcase, etc.). For estimation purposes, use Chicago, IL as the destination. Proposals may include additional funding for travel to pilot site for implementation and testing with proper justification. MxD requires teams to prepare a travel budget but due to the COVID-19 pandemic, onsite meetings may be transitioned to virtual meetings as needed within the period of performance. All teams will be advised to follow the health, safety and travel guidelines provided by the federal and state governments. Due to high variability of travel costs at this point in time, please estimate costs to the best of your ability. If downselected, you will have the opportunity to adjust estimates and provide any substantiation.



## **PERIOD OF PERFORMANCE REQUIREMENTS**

Proposed projects should be no more than twelve 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. For this project there two contracting options.

1. MxD can enter into an Enterprise Award Agreement with the Lead Organization (Prime) and the Lead Organization can flow down the terms and conditions of the agreement to its subcontractors.
2. MxD can enter into an Enterprise Award Agreement with each Offeror organization individually such that no Project Participant will be a contracting Lead Organization. All EAAs will share the same Statement of Work and Intellectual Property Management Plan.

Please indicate which contracting method you anticipate pursuing in the additional information section of your proposal.

## **FUNDING REQUIREMENTS**

MxD anticipates awarding one project for up to \$250,000, not inclusive of expected cost share, under the MxD-20-04 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.



## VII. ELIGIBILITY

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### **MxD MEMBERSHIP**

All organizations selected to participate on projects must be MxD Members, in accordance with the MxD Membership Agreement, prior to project award. This RFP is open to the public; any organizations regardless of membership status may submit a Technical Proposal and Cost Proposal in response to an RFP. MxD, in its sole discretion, may make the Membership Agreement effective upon project selection and require payment of the membership dues. The Membership Agreement must be fully executed with every participant within 30 days of project selection. Any non-members Offerors are encouraged to review the Membership Agreement prior to submission and to direct questions to the MxD Director of Business Development, Tony Papke ([tony.papke@mxdusa.org](mailto:tony.papke@mxdusa.org)). For more information on how to become a MxD Member, please visit the MxD Membership page on our website.

Federally Funded Research and Development Centers (FFRDCs) and Government entities (Government/National laboratories, military educational institutions, etc.) are subject to applicable direct competition limitations and cannot propose to RFPs in any capacity unless they address the following conditions:

- FFRDCs or Government entities may not exclusively team on any specific project team.
- FFRDCs must clearly demonstrate that the proposed work is not otherwise available from the private sector and must also provide a letter on letterhead from their sponsoring organization citing the specific authority establishing their eligibility to compete with industry and propose to solicitations utilizing Government funding.
- Government entities must clearly demonstrate that the work is not otherwise available from the private sector and provide written documentation citing the specific statutory authority, as well as, where relevant, contractual authority, establishing their ability to propose to solicitations utilizing government funding.

Government agencies interested in participating in MxD RFPs as part of an Offeror team should notify MxD in advance of Proposal submission. For RFPs utilizing Government funding, special agreements and considerations may need to be implemented to enable participation.

### **NOTIFICATION OF PARTICIPATION BY FOREIGN FIRMS & NON-U.S. CITIZENS**

As required by the Technology Investment Agreement, membership in MxD shall be granted only to U.S. companies, firms, organizations, institutions or other entities organized or existing under the laws of the United States, its territories, or possessions (as defined in Section 120.15 of International Traffic in Arms Regulations, 22 CFR § 120 et. seq. ("ITAR")). All proposed project participation by Non-U.S. Citizens must be disclosed to MxD at least 60 days prior to proposed participation for approval.

Membership & project participation (or participation in projects without membership status) will be granted to any agency or instrumentality of a foreign government; companies, firms, organizations, institutions, or other entities not organized or existing under the laws of the United States (as defined in Section 120.16 of the ITAR); and Non-U.S. Citizens on a case-by-case basis at the sole discretion of the Executive Committee upon approval of the U.S. Government. In such event, all Members will be notified immediately of the foreign entity's role. It is a requirement that work related to the project must be completed inside the U.S.



If a Member is a Corporation with subsidiaries or affiliates, its membership will include its wholly-owned and controlled and majority-owned and controlled U.S. subsidiaries and affiliates who qualify as a U.S. person under Section 120.15 of the ITAR.

## VIII. TECHNICAL & COST PROPOSAL EVALUATION

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### EVALUATION PROCESS

An MxD Evaluation Board (EB) will review and evaluate each submitted Technical Proposal utilizing the evaluation criteria specified in the following section. Cost Proposals will not be provided to the Evaluation Board for the purposes of evaluation. Cost Proposals will be utilized by MxD and the Government during the cost analysis and project approval process.

The EB may consist of recognized experts from industry and academia and key government stakeholder representatives (when appropriate). MxD representatives, such as the Director of R&D Projects, and respective Project Engineers, may participate in and lead EB meetings. All members of the EB will need to meet strict standards of personal and organizational conflict of interest. The evaluators may be supported by subject matter experts to review and comment upon the proposed work.

Through its deliberations, the EB will determine “selectability” of each submission. Selectability determination incorporates average EB score, judgement of market impact, and budget availability. The EB will identify a list of all proposed Technical Proposals that are “selectable for negotiation” leading to a subagreement award, along with their associated evaluation scores, to the Project Engineer. The Director of R&D Projects, with the consultation of other MxD representatives, will determine which subset of the proposed Technical Proposals deemed “selectable for negotiation” will be down selected for negotiations. This determination will take into account the EB’s recommendation, funding availability, alignment with MxD SIP as well as external stakeholder requirements (when applicable). MxD reserves the right to fund all, some or none of the Technical Proposals received under issued RFPs.

If down selected, MxD will complete a comprehensive cost analysis (including cost reasonableness and cost realism) prior to award. In addition, the Government Agreements office may conduct a cost analysis of all submitted Cost Proposals to approve the Cost Proposals. Approval of the Cost Proposal and Technical Proposal by the Government Agreements office and the DoD Program Manager is required for all MxD projects.

Cost share is required for all MxD projects that are executed through the MxD. Cost sharing or matching relates to the portion of project or program costs supported by the Offeror and not by MxD.

Neither MxD nor the U.S. Government has any responsibility for costs associated with Technical Proposal or Cost Proposal development, submissions, or pre-award negotiations.

### EVALUATION CRITERIA

MxD’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 clear explanation of how



the solutions address business problems and technical requirements outlined in the RFP, any assumptions, and considerations for deployment of developed solution through a pilot.

Each Proposal is evaluated by a specific set of criteria. Below are the Proposal Evaluation criteria for this RFP:

Proposal Evaluation Criteria	Order of Importance
<p><b>Requirements Compliance</b>  <i>Clearly articulates how the team will meet all the capabilities required by the RFP; Proposed solution clearly addresses problem statement and use cases identified in RFP; Clear identification of assumptions, risks, and mitigations; proposed deliverables align with requirements; program management plan meets requirements in the RFP and is reasonable for the scope of work described in the technical proposal.</i></p>	1
<p><b>Methodology</b>  <i>Clear and concise work effort scope targeted at problem statement; Proposed effort of direct relevance to RFP; Clear identification of barriers to implementation and explanation of how they will be overcome; Innovative methodology with high - potential for market impact; Significant and impactful use of external resources; Methodology demonstrates scientific and technical merit; SMART metrics and KPIs identified and described and demonstrate clear understanding of proposed work; Provides a maturity level assessment of both current and future state of technology with substantiation of assessed levels; Deliverables are fully described and identified.</i></p>	2
<p><b>Transition Plan</b>  <i>Transition plan clearly articulates all project results and application into commercial and/or government products, systems and applications; Plan includes detailed descriptions of project results, risks/assumptions/mitigations, all required actions and timing, detailed funding and ROI strategy, key milestones, schedule and go/no-go decision points; Proposed team includes appropriate representation from supply chain, researchers and industrial partners; Transition tasks and partners identified and thoroughly defined, both to MxD members and the broader industry; Solution and strategy to rapidly enable the adoption of the new technologies across the US manufacturing base is presented; Clearly defined IP ownership and innovative licensing strategies designed for rapid adoption of the new technologies; Discussion of future transition and/or commercialization demonstrates a clear understanding of the industry and possible markets for the technology; benefits of technology are clearly defined and substantiated.</i></p>	3
<p><b>Team Qualifications</b>  <i>Members of proposed team are highly qualified to accomplish project tasks with clear delineation of roles and responsibilities; Solid evidence of commitment by team members, such as letters of commitment from their companies; Team members have unique capabilities that are directly associated with the target technology; Team includes a broad mix of capabilities and experiences to ensure success along with the commitment of top-tier facilities to accomplish all project</i></p>	4



<p><b>Cost Factors</b>  <i>Proposed cost estimates are reasonable and realistic for the proposed work effort; The minimum cost share proscribed in the RFP has been met or exceeded; Cost share is clearly defined and directly applicable to the performance and success of the project; Cost share value is readily discernable. Cost share from partners is documented with letters of commitment.</i></p>	5
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## IX. PROJECT AWARDS

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### CONTRACT

MxD projects will be funded under the MxD Tech Investment Agreement W15QKN-19-3-0003 between MxD and the Government. All contractual negotiations related to RFPs will be executed by MxD. Funds will be distributed to those offerors selected through the evaluation/selection process utilizing Enterprise Award Agreements (EAAs). EAAs are Cost Reimbursement/Cost Share agreements.

MxD has provided an EAA template within the PPK for Offerors to **review** prior to proposal submission. **The EAA should not be submitted with the proposal.** After receiving a notification of down selection, MxD will request all down selected project participants to officially begin contract review and negotiations. For this project there two contracting options.

1. MxD can enter into an Enterprise Award Agreement with the Lead Organization (Prime) and the Lead Organization can flow down the terms and conditions of the agreement to its subcontractors.
2. MxD can enter into an Enterprise Award Agreement with each Offeror organization individually such that no Project Participant will be a contracting Lead Organization. All EAAs will share the same Statement of Work and Intellectual Property Management Plan.

Once the EAA is executed the project team can begin working on the project. When applicable, it is the sole responsibility of Offeror organizations to issue sub-awards to any subcontractors and to ensure team members are abiding by the terms and conditions within the EAA.

### FINAL TECHNICAL PROPOSAL & COST PROPOSAL REVISIONS

MxD reserves the right to negotiate the cost and scope of the proposed work with the project participants that have been down selected prior to award. MxD will facilitate the creation of a Statement of Work with all participants including technical scope modifications and program management aspects. All down selected organizations who intend to pursue selection are required to participate in the proposal revision process prior to award. For example, MxD may request that the organizations revise the technical scope to better align to RFP requirements. Neither MxD nor the U.S. Government has any responsibility for costs associated with pre-award negotiations.



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