



The Digital Manufacturing Institute

MxD REQUEST FOR PROPOSAL TECHNICAL SUMMARY & PROGRAM OVERVIEW

MxD-19-03: High-Volume, Low-Cost Item Serialization

Revision 1.0 Release Date: June 12, 2019

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I. RECORD OF CHANGE

Revision	Date	Sections	Description
1.0	12 June, 2019	N/A	Original

II. INTRODUCTION

MxD: The Digital Manufacturing Institute (formerly the Digital Manufacturing and Design Innovation Institute – DMDII) 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 more than 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 members 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.

Any questions regarding this solicitation must be provided to 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.

III. PURPOSE

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 Agile Tech Team, 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





IV. TECHNICAL SUMMARY

PROBLEM STATEMENT

Affordable and practical item level traceability has been urgently needed in consumer-packaged goods and other high-volume manufacturing since the dawn of the industrial age for the following reasons:

- **Real-time operational excellence:** The advent of AI and IoT makes it possible to associate all product lifecycle data with every item produced to drive insights for adaptive quality control, productivity improvement, predictive maintenance, and product performance improvements.
- **Quality assurance:** In order to trace manufacturing issues discovered post production to all items affected and minimize liability through effective recalls.
- **Inventory management:** Allow supply chain leaders to determine accurate item level assessment of their inventory – including date/lot number of manufactured item.
- **Compliance:** Both the Department of Defense and the Food and Drug Administration require item level traceability for a number of critical items (military parts, microelectronics, pharmaceuticals, medical devices) supplied by a global supply chain.
- **Counterfeit Mitigation, Brand and Product Diversion Protection:** Law enforcement as well as consumers have urgently sought a cost effective and accurate method to rapidly assess an item's authenticity.

This project will focus on the pursuit of factory digital twins needed to achieve real-time operational excellence. The critical challenge associated with item level traceability is that although there are a number of existing solutions including visual tags (serial number, barcode; 1 or 2D QRcode, secure printing), electronic tags (RFID), optical techniques (holograms), and emerging tagless solutions (vTag®), none are practical for application to high-volume, low-cost consumer packaged goods such as food or beverage items or other consumables such as battery cells. Manufacturers are looking for item serialization solutions that have the following characteristics:

1. Zero or near-zero net variable cost
2. Zero or near-zero product real estate requirement (i.e. the ideal solution is invisible to the human eye and does not consume product surface area such as UPC codes do)
3. Ability to uniquely identify and serialize each item at the rate of production (i.e., velocities of 10 to 100 items per second and beyond; the ideal solution does not involve additional production steps for marking that slow down production rates)
4. Ability for retailers and consumers to retrieve the unique identifier from an item in the field
5. Ability to standardize the solution so as to support an ecosystem of readers, writers and other hardware and software necessary to support traceability use cases across CPG supply networks



With industry 4.0 and digital manufacturing, a large amount of digital data is being gathered with IoT and other sensors, but challenges arise when data cannot be easily associated with a manufactured item. MxD is seeking a solution for a viable item-level serialization solution that can be used in a high-speed manufacturing environment for low cost consumer products.

OBJECTIVES

The project aims to develop a viable standardized item-level serialization solution for high-volume, low-cost consumer packaged goods (CPG) that

- Uses unique item- or component-level characteristics created via manufacturing processes to identify individual CPG (similar to biometric fingerprinting).
- Is an open-source, system-agnostic solution that will be available to decision makers trying to determine the ideal traceability solution for their needs.
- Provides stakeholders with a tool for selecting the ideal technical solution for their traceability needs that considers total cost of ownership, investment payoff time, and implementation strategy. When a decision maker is able to determine the ideal traceability solution without noisy information, further integration with the future digital factory can be realized.

This project principally seeks to address the following use case:

As a Manufacturing Engineer, I want to be able to associate all product lifecycle data specific to an item to derive real-time and off-line artificial intelligence insights for adaptive/assured quality control, productivity improvements, equipment predictive maintenance, product performance improvements and digital twin benefits.

The solution development should consider additional use cases such as:

As a Quality Assurance Leader, I want to be able to track an item through the factory floor as well as post-shipment in order to ensure regulatory compliance, minimize product liability, maintain effective batch records, manage return merchandise authorization (RMA) and if needed, ensure effective recall notices.

As a Supply Chain Procurement/Management Leader, I need item level traceability to a) ensure that items I have purchased originated from the ordered source with the required quality and batch records and b) I have full visibility of the inventory I have under management at the item level.

As a Regulator, I want to remove barriers to innovation, investment, and performance by reducing regulatory load, and to enable low-cost and adaptable traceability schemes.

As a Law Enforcement Agent, I want to ensure that market participants are protected from theft and fraud, which also illegally benefit criminal organizations, and from counterfeit products that may endanger lives.



TECHNICAL REQUIREMENTS

The technology development should at minimum meet the requirements in the areas of “digital fingerprinting”, data association, and traceability as described below.

“Digital Fingerprinting”

The research will focus on developing and testing solutions that can tag items with unique identifiers (a “digital fingerprint”) by observing and measuring part characteristics for the purpose of high-volume, low-cost item serialization.

- Solutions may be vision- or non-vision- based
- Solution should include a high-speed system for enrolling the product
- Method should have zero net variable cost per item
- Serialization method can be applied and associated at rates of high-volume, low-cost production (on the order of 0.06s/item or less)
- Solution should be flexible to accommodate variance in product and process (i.e. solution for both small and large items)
- Hardware form, fit, and function should be flexible to allow for integration with production lines of variable type and design
- Server application to integrate with imaging or detection system hardware should be commercially available or open source

Data Association

The success of the “digital fingerprinting” solution depends on its ability to interface with hardware and software needed for high-speed, high-volume data processing and storage for association. While innovation will primarily revolve around the fingerprinting technology, considerations for feasibility, interoperability, and adoption should be considered for data association.

- Scope should include provision of a backend server (on-premise, on-premise cloud, or cloud) for processing and storage with consideration of storage volume and processing speed for high-volume applications
- Scope should include provision of a database to store serialization information and meta data associated with each product
- Software, communication protocols, and APIs for access to historian database should be made open source and integrate with existing databases. Solution should follow a common data structure strategy.
- Solution should account for and utilize existing standards in serialization, communication protocol, data security, etc. New standards informed by this research should be well-documented.

Traceability

“Digital fingerprinting” technology is an enabler of item-level traceability from inventory management, factory floor tracking, to in-field regulatory compliance. Traceability is a key



benefit resulting from this solution, and traceability use cases must be considered during development and validation.

- Solution must include development and demonstration of a handheld or benchtop unit for low volume inspection and verification
- Solution must address contamination robustness (in the face of dust, abrasion, etc.) and test and validate in the field over time
- Solution must account for physical changes in product and work effectively over product lifecycle
- Solution must consider ease and accuracy of product traceability throughout factory during production and beyond

RFP SCOPE OF WORK

This solution will be developed, tested, and validated using a phased approach. Phase 1 will address the problem space through an in-depth gap analysis of existing technologies, feasibility analysis on the solution space, and evaluation of technology deployability by target manufacturer demographic. The work completed during Phase 1 will inform a Phase 2 Option which will focus on proof-of-concept development, test, and validation of one or more of the serialization solutions researched in Phase 1.

MxD will award only Phase 1 based on responses to this RFP. The Phase 2 Option scope of work may be awarded by MxD following the completion of Phase 1.

Period of Performance

- Estimated 3-4 months of Phase 1 research; ending no later than December 31, 2019
- Option period up to 9 months of proof-of-concept; may be divided into multiple 3-4 month periods

PHASE 1

During Phase 1, the team will produce foundational deliverables (listed in Table 1) necessary to support and de-risk the execution of the Phase 2 Option. First, the team will define the key technical and business requirements of the solution in the US manufacturing base along with metrics which will be used to validate the solution viability and deployability. This research will be delivered in a Report on Requirements.

Second, the team will conduct preliminary research and component-level lab-scale feasibility testing on solution. This research may examine multiple solutions or methodologies in the solution space. Offerors should clearly explain their approach for lab-scale testing and, if applicable, any plans for use of MxD's Factory for testing. The solutions detailed in the Final Report and attachments will be evaluated for proof-of-concept development in the Phase 2 Option. This report will include the following elements:

- results of preliminary research and component-level lab-scale feasibility testing
- detailed technical analysis and validation of solution(s) according to metrics identified in the Report on Requirements



- evaluation of deployability of each solution by target manufacturing demographic according to metrics developed in the Report on Requirements including, but not limited to, costs of ownership and maintenance, investment payoff time, and implementation strategy

Phase 1 shall have a period of performance estimated at 3-4 months in duration and must end no later than December 31, 2019.

Table 1. Phase 1 Technical Deliverables

Deliverable	Description
Report on Requirements	Survey of target demographic to establish key requirements of solution and validation metrics
Final Technical Report Attachments	Attachments include results of preliminary research and testing completed, technical analysis and validation of each proposed solution according to metrics, evaluation of deployability of each solution.
Lab-Scale Testing System(s)	Inclusive of software, hardware, and data developed or used in Phase 1 that is needed to continue research in Phase 2.

Pilot Manufacturer Scope of Work

This project requires collaboration with a Pilot Manufacturer(s) (defined and explained in “Program Requirements” section) that will participate on the project team with down-selected Offerors. The Pilot Manufacturer(s) will provide technical advising in order to define requirements, drive the business case for project outcomes, and serve as a pilot for test and validation in order to demonstrate project outcomes in a relevant environment. Offerors may assume the Pilot Manufacturer scope of work for this project will include:

- definition of key technical requirements
- provide expertise on existing serialization and association technology
- engineering for technical advising and analysis of solution options and performance
- provide infrastructure, including machine access and existing serialization technology, and system integration (when applicable) for production-scale testing
- provide necessary hardware and software for interfacing with manufacturer’s existing servers, graphics processors, data communications software, and I/O between production controllers and AI neural network programs for production-scale testing
- provide information technology (IT) and operational technology (OT) support
- provide sample products and materials, historical datasets (including imagery) for large number of products manufactured at high speed (data mirroring for redundancy through firewall for external access from OT to IT)
- provide SQL server database and image storage space for production-scale testing, if applicable
- facilitate user acceptance testing



The Pilot Manufacturer scope of work will be fully defined in collaboration with down-selected participants during the Phase 1 Statement of Work (SOW) creation.

NOTE: Offeror teams should NOT include a Pilot Manufacturer(s). Pilot Manufacturer(s) will be selected by MxD outside this RFP.

OPTION PERIOD: PHASE 2

NOTE: Provide cost proposals for the Option period separately.

Phase 2 will build upon Phase 1 research through the proof-of-concept of one or more serialization solutions researched in Phase 1. During Phase 2, the team will iteratively develop, test, demonstrate and validate a serialization solution in collaboration with a Pilot Manufacturer. The scope of work shall include:

- determination and procurement of required hardware for vision/detection and servers
- software development and testing of APIs for access to vision/detection systems, server applications, and databases
- software development and testing for data analytics including data processing and association
- plan and development of project data management system for the pilot with considerations for storage and security
- development of software and data architectures
- demonstration of solution(s) on testbed including system integration of both vision/detection system for enrollment and handheld or benchtop system for low volume inspection and verification and static and dynamic testing
- testing of solution(s) in production environment
- training by subject matter experts for stakeholders to implement selected solutions

Phase 2 deliverables must include, but are not limited to, what is listed in Table 2.

Table 2. Phase 2 Technical Deliverables

Deliverable	Description
Digital Fingerprinting Solution	Software, hardware, methods or other technology developed that comprise the digital fingerprint technology
Hardware BOM	System equipment and integration hardware BOM
Data Aggregation and Analysis Software	Beta solution of software for data analytics (as applicable)
System APIs	Server application to integrate with imaging system hardware
Source code	Source code for all software modules
Testbed Design and Build	Testbed at MxD available for stakeholders to test, validate, and de-risk solution



Report on Demonstrations	Report on demonstrations at MxD and/or production environment including approach and results necessary for repeatability
System Architecture Diagrams	Hardware, data flow, network, and software architecture diagrams
Testbed User Manual	User Manual for MxD and members to use, adapt, and build on testbed
Testbed Training Curriculum	Training curriculum for target users for implementation of selected solutions using testbed as training tool
Stakeholder Training Program	Training by subject matter experts to guide stakeholders from target demographic to implement selected solutions
Standards Report	Standards enhancement deliverables including report on recommendations for standards and/or materials used to inform standards bodies

Pilot Manufacturer Scope of Work

This Option requires collaboration with a Pilot Manufacturer(s) (explained in “Program Requirements” section of the RFP) that will participate on the project team with down-selected Offerors. Offerors may assume the Pilot Manufacturer scope of work for this Option Phase 2 will be inclusive of the contributions listed under “Phase 1”. The Pilot Manufacturer scope of work will be fully defined in collaboration with down-selected participants during the Statement of Work (SOW) creation for Phase 2.

NOTE: Offeror teams should NOT include a Pilot Manufacturer(s). Pilot Manufacturer(s) will be selected by MxD outside this RFP.



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PROGRAM OVERVIEW





V. PROGRAM REQUIREMENTS

COLLABORATION

Participation in this program requires collaboration with one or more manufacturers, “Pilot Manufacturers,” that will define technical requirements, drive the business case for project outcomes, and serve as a pilot manufacturer for test and validation. The Pilot Manufacturer(s) will provide the scope of work outlined in the RFP Technical Summary under “Pilot Manufacturer Scope of Work”. The selection process for Pilot Manufacturers will take place separately from this RFP and Pilot Manufacturers will be matched with the Offeror team after down-selection to participate in scope negotiations and creation of a Statement of Work (SOW). To streamline this process, the proposed scope of the Pilot Manufacturer has been included in the RFP and should be taken into account by the Offeror when preparing their initial proposal. Any assumptions about the Offeror’s collaboration with a Pilot Manufacturer(s) should be clearly articulated in the technical proposal.

NOTE: Offeror teams should NOT include a Pilot Manufacturer(s). Pilot Manufacturer(s) will be selected by MxD outside this RFP.

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. 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 deliverables and 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.

Deliverable	Description
Project Immersion Workshop	Face to face meeting with Pilot Manufacturer including stakeholders from key business units to review project transition plan and define pilot requirements
Transition Plan	Written plan for successful transition of project outcomes after period of performance including technology integration, educational distribution, and potential commercialization.
Monthly Technical and Financial Reports	Monthly report including the financial and technical status of the Project
Member Technical Reviews	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.
Presentations at MxD	Presentation and demonstration of developed technology presented in person at MxD
Annual Patent Reports	Report of inventions and subcontracts



Intellectual Property Reports	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.
Safety Accident/Incident Report	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.
Draft Final Technical Report	Draft report must include a comprehensive, cumulative, and substantive summary of all technical advancements and significant accomplishments achieved during the project.
Final Technical Report	See above
Project Team Lead Release	Release by Project Team Lead confirming scope of work to be complete
Property Report	List of all MxD funded equipment and planned disposition
Final Patent Report	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.

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, when applicable, between the Lead Organization and the Project Participants. For this project MxD will enter into an Enterprise Award Agreement with each Project Participant individually such that no Project Participant will be a contracting Lead Organization.

FUNDING REQUIREMENTS

MxD anticipates awarding one project Phase 1 for \$175,000-\$215,000, not inclusive of expected cost share, under the MxD-19-03 RFP. This funding amount does not include the participation costs for any Pilot Manufacturers; funding for Pilot Manufacturers will be determined through a separate selection process. 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.



VI. ELIGIBILITY

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). For more information on how to become a MxD Member, please visit the MxD Membership page on MxD's 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.



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.

VII. TECHNICAL & COST PROPOSAL EVALUATION

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>Requirements Compliance <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>Methodology <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>Transition Plan <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>Team Qualifications <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 tasks.</i></p>	4
<p>Cost Factors <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



VIII. PROJECT AWARDS

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. After receiving a notification of down selection, MxD will request all down selected project participants to officially begin contract review and negotiations. Once the EAA is executed the project team can begin working on the project. It is the sole responsibility of the Lead Organization, if applicable, to issue sub-awards to all members of the team 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.