



The Digital Manufacturing Institute

MxD REQUEST FOR PROPOSAL

TECHNICAL SUMMARY & PROGRAM OVERVIEW

MxD-20-11:

Emerging Technology in Manufacturing &

Cybersecurity Research in Manufacturing

Revision 1.0 Release Date: July 17, 2020

Contact: Joel Sheaffer
Project Engineer
MxD
projects@mxdusa.org

MxD
1415 North Cherry Ave
Chicago, IL 60642

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I. RECORD OF CHANGE

Revision	Date	Sections	Description
1.0	17 July 2020	N/A	Original

II. PROJECT OVERVIEW

Program Details	
Anticipated MxD Funding	\$75,000
Potential Industry Cost Share Support	\$75,000
Anticipated Number of Awards	Multiple
Period of Performance	9-12 Months
Potential Follow on Funding Period	Up to 2 additional years

Key Dates	
Project Call Released	17 July 2020
White Papers Due	3 September 2020
White Paper Downselection Notification	22 September 2020
Full Proposal Due	October 2020

MxD intends to continue our investments into Emerging Technologies in Manufacturing and Cybersecurity Research in Manufacturing. On an annual basis MxD will re-release this RFP, to both solicit new research ideas and give previously awarded teams an opportunity to receive additional funding to complete follow on research after an annual review. As advances are made in manufacturing technologies there is the possibility that the topic areas listed in this RFP may be modified on an annual basis. Additionally, successful “emerging technology” projects have the potential to define larger, more specific, MxD research projects in the future.

III. INTRODUCTION

MxD: The Digital Manufacturing Institute 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, manufacturing technology, cybersecurity and workforce development 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 white paper 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 Proposals. 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 <https://mxdusa.org/projects/>. 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 White Paper 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.

IV. PURPOSE

MxD will periodically solicit proposals via an RFP 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. An RFP is initiated when MxD desires new and creative solutions to manufacturing 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 its Technology Advisory Committee (TAC) members, MxD's Technical Call participants, Department of Defense (DOD) affiliates, and other relevant stakeholders, and with consideration of broader industry needs and trends. 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.



mxdusa.org
@mxdinnovates
info@mxdusa.org

1415 N. Cherry Avenue
Chicago, IL 60642
(312) 281-6900

REQUEST FOR PROPOSAL TECHNICAL SUMMARY





V. TECHNICAL SUMMARY

PROBLEM STATEMENT

MxD is committed to improving U.S. manufacturing competitiveness and is at the leading edge of emerging digital manufacturing technologies. Technology breakthroughs can be unpredictable, but MxD is continuously monitoring and evaluating rapidly evolving transformative manufacturing technologies. MxD plays an important role in connecting industry partners with the resources they need to better understand novel technologies that will have the highest impact to their businesses. Through project investments and programming activities, MxD engages its vast academic network to gain greater visibility into the manufacturing technologies of the future and invests in these technologies to proactively support the long-term development pipeline. Thus, MxD is releasing a Request for Proposals targeted at academic institutions to aid in the development of early stage (TRL 3-6) applied research in digital manufacturing and cybersecurity research in manufacturing.

This program is intended to enable MxD to partner with academia on early stage technology and cybersecurity R&D to better define our technology roadmapping, strategic investment planning, and preparation for future technology topics while also providing value to our academic and industry partners. Through early engagement with industry stakeholders, researchers will be able to better structure their work to have maximum impact in the future. MxD is coming together with its industry partners to provide funding, guidance, and feedback for early stage, applied research.

Academic organizations should provide a vision of how their early stage research could have a direct impact on manufacturing through increases in accuracy, speed, repeatability, safety, etc. For academic organizations without an industry partner, MxD plans on leveraging its network to appropriately pair an industry partner with their research after the submission of a White Paper.

MxD and its industry members are most interested in the development of technologies in the following key cutting-edge domain areas:

Emerging Technology in Manufacturing	Cybersecurity Research in Manufacturing
<ul style="list-style-type: none">• Physics Based Digital Twins• Model-based Systems Engineering• Artificial Intelligence/Machine Learning• Advanced IIoT Sensors	<ul style="list-style-type: none">• Cloud Manufacturing Digital Twins for Modeling Attacks• Quantum Encryption of Data• New Operating Technologies• 5G & Wi-Fi 6 for Manufacturing



CRITICAL OBJECTIVES AND REQUIREMENTS

MxD believes that this is the time to invest in further development of emerging manufacturing and cybersecurity for manufacturing technologies. To that effect, this project will focus on the furtherment of research by academic institutions in one of the domain areas listed below.

Emerging Technology in Manufacturing

Physics Based Digital Twins

Having a multi-physics-based digital twin of a system will allow you to generate answers for various what-if scenarios. You can test and assess asset performance prior to physical prototyping in very specific situations under very specific circumstances before the very first launch of the product, such as an aircraft or a machine. The need for physical prototyping, associated costs of testing (including destructive techniques like crash testing), and the time required from concept to launch of a product, would be greatly reduced by leveraging these capabilities.

Model-Based Systems Engineering

While there have been many advancements in Model-Based System Engineering (MBSE) in recent years there are still many gaps in the methodology that need to be filled. The breadth and depth of system reasoning in many MBSE tools are still limited. Further advancements in requirement elicitation, trade-off analyses, verification & validation, and collaboration are still needed. MBSE has the potential to reduce costs, achieve superior quality and ultimately reduce time-to-market for new products.

Artificial Intelligence/Machine Learning

While AI is poised to disrupt many industries, the technology is exceptionally well suited to drive massive improvements in manufacturing and has already begun to do so. Further advancements and exploration of AI/ML for manufacturing will ultimately improve quality control, shorten design times, reduce material waste, perform predictive maintenance and more.

Advanced IIoT Sensors

The development and adoption of the Internet of Things has been a critical element of smart manufacturing. Though many manufacturers have begun implementing sensors in their facilities further advances in sensor technology are still needed to fully realize the impact Industry 4.0 on factory visibility, automation, energy management, proactive maintenance and connecting the supply chain.

Cybersecurity Research in Manufacturing

Cloud Manufacturing Digital Twins for Modeling Attacks

For the benefits of cloud manufacturing i.e. flexibility and cost savings to be fully realized, it is important that security considerations are identified and measures to mitigate advanced to assure potential adopters and growth in adoption. A less intrusive method for managing the vulnerability in this construct is the creation and simulation of attacks on a representative model.



Quantum Encryption of Data

Cryptography and advances in processing technology have implications for the protection of data including intellectual properties. As computing capabilities are enhanced through quantum processing, it is important that the implications for manufacturing are clearly understood and provision made for effective and efficient deployment of this technology for the security of manufacturing operations.

New Operating Technologies

The goal is for research into new or existing technology solutions that can be adapted for use in manufacturing to improve security. In response to an ever-evolving technology landscape, new technologies are being introduced to enhance productivity and other key improvement needs. These include technologies dedicated to securing operations and those devoted to advancing digital manufacturing.

5G & Wi-Fi 6 for Manufacturing

The march to industry 4.0 and technologies like wireless connectivity are further enabled by the relative ease of deployment and flexibility these technologies allow. Just as important is the security and secure deployment and use of these technologies in manufacturing. The focus is on related research that explores practices and technology solutions for the secure use of these technologies.

To effectively respond to this RFP, there are a number of key items that need to be addressed in the responding team's White Paper.

Focus and Scope of Research

An overview describing the focus and scope of the research planning to be completed during the duration of this project. It is important that the Offeror's recent experience in performing work relating to this effort be elaborated upon. Define the current baseline of technology. Clearly define what the expected outcomes of this research will be in both the context of this project and the context of future work. Specifically, define the future state of both the research and technology if provided one-to-two years of additional funding. Discuss the extensibility of the research being completed.

Industry Application or Use case

Clearly define what industry or manufacturing problems the research being conducted will focus on. Define what the potential transformative impact the proposed research could have on industry. The proposed research must be driven by an industry use case. It is required that a use-case is provided and that it is defined as user stories, framing the problem from the perspective of an end user. A user story describes the type of user, what they want and why they want it. An example format for framing problems as user stories has been included below.

As a < type of user >, I want < some goal > so that < some reason >.



Define the role an industry partner needs to play at this stage of research. Furthermore, outline what items you may need from an industry partner at this time, be it better defined requirements or use of their facilities.

Methodologies

Clearly define how the research will be completed, elaborating on both development methodologies and program execution. Elaborate on testing plans, supporting technologies that will be used to complete testing, and stakeholder involvement. Thoroughly define what potential challenges and risks may be posed in the research efforts and mitigation plans for each. Define what success looks like at the end of the initial and subsequent funding periods. Define what the ideal transition of the technology looks like (e.g. commercial partners, industry partners, follow on research).

RFP SCOPE OF WORK

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

Period of Performance:	9-12 months
Anticipated MxD Funding:	\$75,000
Potential Industry Cost Share Support	\$75,000
Anticipated Number of Awards	Multiple
Potential Follow on Funding Period	Up to 2 additional years

During the period of performance, the team will produce deliverables that will be shared with the MxD membership in accordance with the Membership Agreement. The minimum 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.

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 achieving deployable outcomes and enabling the transition of the research.

Table 1. Technical Deliverables

Deliverable	Description
Final Technical Report	Report must include a comprehensive, cumulative, and substantive summary of all technical advancements and significant accomplishments achieved during the project.
Transition Plan	Written plan for successful transition of project outcomes after period of performance including distribution and follow-on efforts for phase(s) 2 & 3. Desired future industry partners should be clearly identified with a plan of action for future participation.
Final Technical Presentation/Demonstration	Presentation must include a comprehensive, cumulative, and substantive summary of all technical advancements and significant accomplishments achieved during the project. A demonstration of the technology in its current state must be performed.
Educational Impact	Provide documentation on course/lab module presented to students demonstrating the use of technology to increase awareness in topic area. Will be made available to MxD Learn for future educational content.



The team is expected to develop a transition plan, which is detailed in Table 1. MxD is focused on supporting the transition of the outcomes of these efforts in the form of **follow-on research projects**. On an annual basis MxD will re-release this RFP, to both solicit new research ideas and give previously awarded teams an opportunity to receive additional funding to complete follow on research after an annual review. The outcomes of these projects will inform our investment strategy and may ultimately lead to larger, more targeted, research projects. 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.

VI. INDUSTRY SUPPORT

MxD has identified a number of industry members that are interested in supporting academic teams in their research in a number of ways. The specific organizations, their interests, and their offerings have been provided below.

Autodesk

Autodesk makes software for people who make things; they offer commercial software that could provide value to proposing teams. If the objectives of the proposal align with Autodesk's offerings, Autodesk will provide software licenses to Education users as outlined in their [Education Users - Additional Terms](#).

Software AG

Software AG is a leader in platform integration and IoT for enterprises; they offer commercial software that could provide value to proposing teams. If the objectives of the proposal align with Software AG's offerings **and strategy**, Software AG is willing to provide in-kind software to proposing teams for use during the project in these topic areas: Model-based Systems Engineering, Artificial Intelligence/Machine Learning, Advanced IIoT Sensors. Within the proposal, please indicate which software the project would like to leverage.

Dow Inc. (Dow)

Dow Inc. (Dow) has interest in the following advanced technology sensor areas to support their business needs:

- On-line / At-line Viscometer for polymer systems
- Terahertz spectroscopy for corrosion, fouling and density measurements
- On-line / In-situ imaging within vacuum environments
- Flexible electronics: wrap-around wireless sensors on process lines and equipment to detect leaks, confirm flow
- Superhydrophobic surfaces for sensor applications in corrosive fluid services
- Battery-less IIoT sensors that harvest thermal, vibration, solar energy sources for power

Please contact MxD at projects@mxdusa.org for specific problem statements for the advanced technology sensor area(s) in which your team is interested in developing a proposal to address.



If the objectives of the proposal align with Dow's interests, Dow may be willing to provide an in-kind investment to support the specific sensor technology project, at Dow's sole discretion, subject to Dow project review and requisite management approvals.



mxdusa.org
@mxdinnovates
info@mxdusa.org

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PROGRAM OVERVIEW



VII. PROGRAM REQUIREMENTS

COLLABORATION

Teams are required to be led by an academic organization. More than one academic organization can be on the same offeror team. Preference will be given to teams that are comprised of both academic and industry partners. When not pairing with an industry partner, MxD will leverage its network to the best of its ability to pair the offering academic organization(s) with one. The differences between the two collaboration methodologies have been outlined in the table below.

Team with Industry	Paired with Industry
<ul style="list-style-type: none">Academic Institution proposes to the open project call with an Industry Partner as part of the offeror teamIndustry Partner provides feedback on research	<ul style="list-style-type: none">Academic Institution proposes to the open project call without an industry partner on the offering teamMxD will identify interested Industry Partners for pairingIndustry partner provides feedback on research

Where applicable, the proposing team is suggested to collaborate with a standards organization to better inform their draft standards and to help popularize their work to increase the potential for endorsement in the future.

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 and Director of Cybersecurity 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 and Director of Cybersecurity 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.

Table 2: Program Deliverables

Deliverable	Description
Monthly Technical and Financial Reports	Monthly report from each Project Participant 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

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 between the Lead Organization and the Project Participants.



FUNDING REQUIREMENTS

MxD anticipates awarding multiple projects for both the Emerging Technologies in Manufacturing and Cybersecurity Research in Manufacturing for \$75,000, not inclusive of expected cost share, under the MxD-20-11 RFP. Final Award amounts will be adjusted accordingly based on Proposals received and subsequent evaluations.

There are two potential funding methods for this project. For academic organizations that do not have an industry partner on their proposing team, MxD will leverage its network to assist in matchmaking after the submission of White Papers. It is expected that the Industry partner on each offering team cover the cost share requirement for their academic partner(s). The details and expectation of the offering organization(s) have been outlined below.

Team with Industry	Paired with Industry
<ul style="list-style-type: none">• Academic Institution proposes to the open project call with an Industry Partner as part of the offeror team• Industry Partner covers cost share requirements• Industry partner provides feedback on research	<ul style="list-style-type: none">• Academic Institution proposes to the open project call without an Industry Partner on the offering team• MxD will identify interested Industry Partner(s) for pairing• Industry Partner covers cost share requirements• Industry partner provides feedback on research

This project requires a minimum 1-to-1 Cost Share in aggregate by each Offeror team. This means that for every dollar of MxD funding awarded, the team needs to contribute a dollar of in-kind effort or cash. Thus, the entire team in aggregate will need to provide at minimum 50% of the total project cost (inclusive of labor, equipment, materials, indirect, etc.) in cost share. After downselection and team forming, a detailed cost proposal will be required from the team. If the proposing team does not have an industry sponsor as member, cost share matching does not need to be captured in the White Paper submission.

NOTE: Project award timelines are subject to the availability of funds from the government.



VIII. 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 White Paper 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 our website.

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.



IX. WHITE PAPER EVALUATION

EVALUATION PROCESS

MxD is requiring the submittal of a four-to-ten page White Paper in response to this RFP. The White Paper should outline the proposing team's technical and strategic approach to completing their research/solution.

MxD will utilize the submitted White Papers to make its first downselection. A full technical proposal may be required of project teams after downselection. The required template for the White is provided as an attachment in the PPK. Project teams that fail to submit a White Paper by the required date and time identified in the RFP will not be evaluated.

An MxD Evaluation Board (EB) will review and evaluate each submitted White Paper utilizing the evaluation criteria specified in the following section.

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, Director of Cybersecurity 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 White Papers 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 and Director of Cybersecurity, 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 White Papers received under issued RFPs.

If down selected, MxD will complete a comprehensive cost analysis (including cost reasonableness and cost realism) prior to award. Approval of the final 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.

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
Potential Industry Impact <i>Clearly articulates how the research has the potential to be impactful to industry; Proposed solution clearly addresses problem statement and use cases identified by the proposing team; Clear identification of assumptions, risks, and mitigations; proposed deliverables align with requirements. The work being done is clearly driven by an industry use case</i>	1
Methodology <i>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>	2
Transition Plan <i>Transition plan clearly articulates all project results and application into follow on research, 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 strategy, key milestones, schedule and go/no-go decision points; Clearly defined IP ownership and innovative licensing strategies designed for rapid adoption of the new technologies; Discussion of future transition and/or research demonstrates a clear understanding of the industry and possible markets for the technology; benefits of technology are clearly defined and substantiated.</i>	3
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 organizations; 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>	4
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;. Where applicable, cost share from partners is documented with letters of commitment.</i>	5



X. 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. **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. MxD will execute EAAs with every Offeror organization individually (i.e. MxD will function as the Project Prime/Lead) and 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

After downselection, offerors are required to submit a technical proposal and full cost proposal. Pending selection, the submitted white paper may be sufficient for the required technical proposal. 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.