MxD: AMMO Update

January 4, 2022

FEBRUARY 25, 2021

MxD Secures $8.5 Million in 2021 Defense Appropriations Legislation

**Institute to Lead Efforts in 5G for Manufacturing and Arsenal Supply Chain Cybersecurity**

MxD   🐦   f   in

Accelerate 5G Adoption in Manufacturing

Strengthen OIB/DIB Supply Chain

5G for Manufacturing at MxD

- **Private spectrum, mmWave installation** in partnership with AT&T
- **Public spectrum, midband** installation coming in 2022
- **Secure Wireless for Factory Operations** testbed in development
- Developing **success stories & use cases** for additional testbeds
- Provide mechanisms for DoD and MxD members to **leverage 5G on the Factory Floor**
- Prepare and **train the workforce** for a 5G future
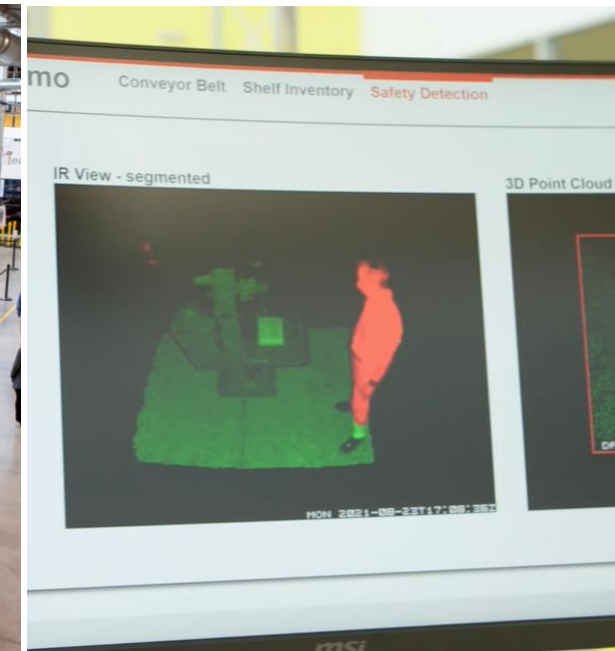
Paladin Howitzer Model Based Enterprise R&D Demonstration

Decrease response time to DLA 339s by improving accuracy of TDPs and facilitating exchange of technical information among ESAs, DLA, and suppliers (currently upwards of 10 months)

Key Goals

- Establish more effective and efficient management of procurement and delivery activities for components and systems throughout their lifecycles

- Digitally connect the information flow across engineering design, manufacturing, sustainment, maintenance, and disposal

- Establish a reference source of consolidated, digitalized information for components and systems (model-based definition) and platforms (PDM/PLM) to store, exchange, and update the digital information

Engineered System – M109 Howitzer

Work Plan

Work Description	Major Milestones	Project Month																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Phase 0: Requirements Definition	* Validated project requirements to issue RFQs * Validated project scope and budget allocation	▓	▓	▓															
Phase I: Resource Allocation, Mobilization, &	* Evaluated quotations/proposals and selected resources * Sourced, onboarded, and aligned project resources			▓	▓	▓													
Phase II: Front-End Development	* Trained ESAs, design engineers, manufacturers, and stakeholders on modern technical data packages * Validated design bases for modern technical data packages			▓	▓	▓	▓	▓											
Phase III: Detailed Engineering	* Architected/integrated elemnets of minimum viable PxM platform * Minimum viable modern technical data packages for selected parts * ESA approved modern technical data packages							▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓	▓
Phase IV: Supply Chain/Manufacturing Management	* Approved minimum viable modern technical data packages with manufacturing information using the PxM platfom * Fabricated parts using PxM platform and modern technical data packages														▓	▓	▓	▓	▓

20-16-01

SUPPLY CHAIN RISK ALERT 2

Develop middleware product for supply chain risk management that brings together data sources and advanced analytics and overlays them with a supplier network

Project Team: Coupa, DOW, DLA, RAAD360, SCRMC, Software AG, Supply Dynamics

Pilots: DOW, DLA, Jiobit/Life360, Lockheed, Oshkosh

Period of Performance: November 2020 – May 2022

Budget: $6M MxD Funding

Funding Source / Contract: CARES Act / OTA-P

Current Status: Execution

"As a supply chain manager, I want the ability to securely share data between multiple tiers of suppliers, understand where all my direct and indirect suppliers are and their relationships to one another, and predict future risks in order to proactively mitigate risk both strategically and operationally.

INDUSTRY CHALLENGE

Industry 4.0 is built upon the movement of data along the digital thread. A key challenge experienced by manufacturers in the digital transformation of the supply chain is developing a culture of trust for sharing data between suppliers. Supply chain resiliency is limited by timely access to supply chain data.

PROJECT SOLUTION & OUTCOME

- This program will focus on developing and demonstrating proof-of-value of a connected, artificial intelligence/machine learning (AI/ML) based supply chain mapping and risk management platform that will:

- Provide end-to-end visibility into a manufacturer's supply chain to support informed, efficient, and systematic decision making; and

- Provide advanced warning of supply chain risks to promote proactive risk management to improve resiliency.

IMPACT

MxD will leverage its network to develop and deploy an integration platform through the following tasks:

1. Understand methods for secure data exchange to develop a flexible platform architecture

2. Use the platform to connect data into a Supply Chain Map

3. Use platform to connect risk data and develop a machine learning system to predict future supply chain risks

The platform will be deployed in small scale pilots for manufacturers across multiple industries including the wearable devices industry.

20-17-01

RAPID AND SECURE DEPLOYMENT OF MEDICAL DEVICES AND INSTRUMENTATION

Creating digital methodology framework to expedite the approval of medical devices by the FDA, ultimately decreasing the time to market

Project Team: Fast Radius, Siemens

Period of Performance: Feb 2021- Sep 2022

Budget: $6.2M Total Funding

Funding Source / Contract: CARES Act / TIA

Current Status: Execution

"As a manufacturer of medical devices and medical device components I want a define digital process that will enable the FDA to quickly approve new parts."

INDUSTRY CHALLENGE

The COVID-19 pandemic exposed critical vulnerabilities in the global health care supply chain. To overcome those vulnerabilities, we need to speed up the design and production of improved medical devices by leveraging the benefits of a Digital Methodology Framework combined with device manufacturing using 3D printing incorporating additive manufacturing and product simulation.

IMPACT

The developed resources will minimize the time to market for new medical devices and medical device components. Similarly, the tools developed in this project will ultimately shorten the time it takes for "personal medical devices" to get in the hands of surgeons and end-users of the products.

PROJECT SOLUTION & OUTCOME

- An established expanded Digital Methodology Framework to guide future project through the digital design and production process.
- Complete and properly document QQ and PQ for each component, assembly, and product
- Defined pathways for completing appropriate FDA validations
- A fully integrated Digital Methodology Framework Platform
- Multiple(4-6) Digital Methodology Framework workshops for dissemination and awareness

20-25-01

PATHFINDER PHASE II: SECURING 3D PRINTERS IN MANUFACTURING

Phase II of the Pathfinder project covers the implementation and evaluation of the security measures that have been identified during the assessment of a Fused Deposition Modeling (FDM) system in an environment that reflects one utilized by DoD.

Project Team: H2L Solutions, MarkForged, MxD, DoD

Period of Performance: October 2021 – May 2023

Budget: $0.5M MxD Funding

Current Status: Execution

"As a user or manufacturer of additive manufacturing (3D printing), I want a defined and thorough security process to increase security in the use of 3D printers."
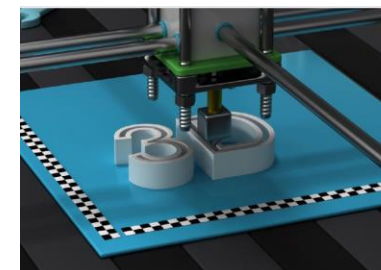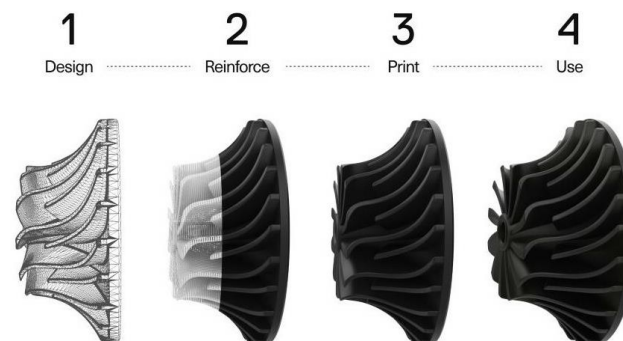
INDUSTRY CHALLENGE

- Currently, security requirements are not referenced or used as a guideline to validate compliance within AM such as: NIST SP 800-37, NIST SP 800-53, NIST SP 800-60, NIST SP 800-82, FIPS 199, and others

- There is limited to no guidance for end users to secure 3D printers

Phase II of the Pathfinder project covers the implementation of the security measures that have been identified during Phase I for the evaluation a Markforged 3D printer. During Phase II, we will continue to expand and increase security in the manufacturing and use of 3D printers in order to provide assurance for the machines to connect to enterprise networks.

PROJECT SOLUTION & OUTCOME

- Utilize Phase I deliverables and Markforged's X7 (3D printer) to implement the security measures identified in the assessment from Phase I

- A refined Markforged X7 printer to ensure security compliance

- Development of an Additive Manufacturing Cybersecurity Playbook addressing the Risk Management Framework Package

IMPACT

- The final goal is to develop a security approach that can be provided to the DIB and its supply chain for future connectivity to expand DoD's capacity when required