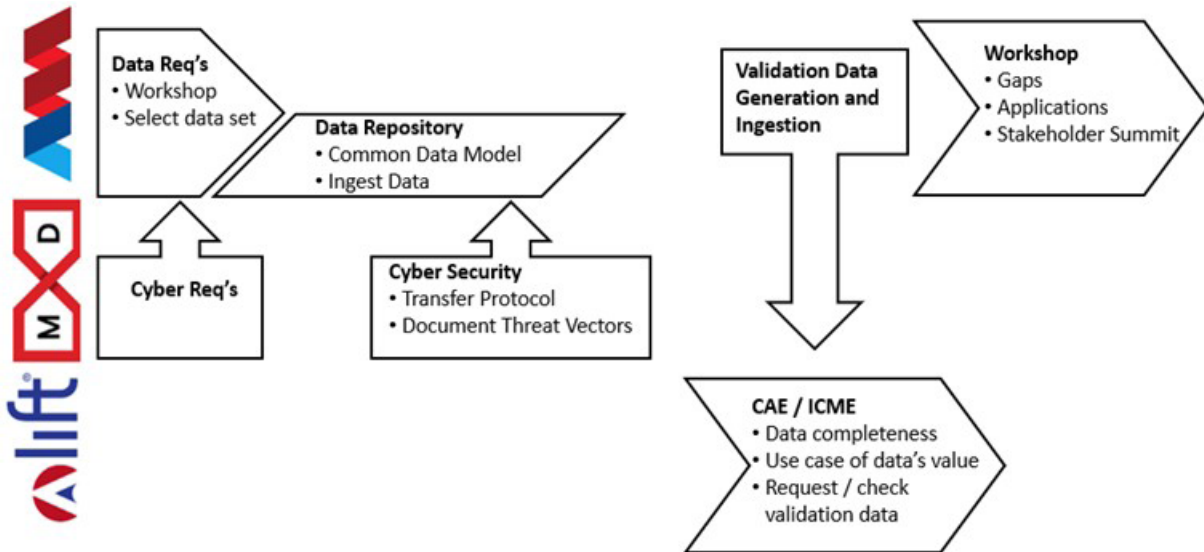


Digital Data Management for Transcribing Structural Part Performance Across Additive Manufacturing (AM) Platforms



Key focus areas for virtual verification and validation of parts across different manufacturing platforms.

PROBLEM

The Army has developed the process for additively manufacturing and post processing ramjet projectile inlet nozzles and nickel rotating bands. To scale production, a method is needed to ensure the as-built quality of these components when produced on different AM build platforms. Current approaches for process qualification, also known as system equivalence, require many coupons and parts to be built and tested. This often costs upwards of \$1M and can take up to six months.

OBJECTIVE

The multi-year, long term goal is to qualify structural parts for use straight from the manufacturing process, without the need for a nondestructive evaluation or lot acceptance testing step. This effort focuses on understanding the primary factors influencing product quality and how they can be captured in the digital build log during manufacturing. Utilizing existing data from America Makes, LIFT, and MxD, the team is determining minimum data needs to ensure interoperability of the framework across various platforms.



**AMERICA MAKES
TECHNOLOGY
DEVELOPMENT
ROADMAP**

This project aligns to:



PROCESS

**ASTM PROCESS
CATEGORY**
Powder Bed Fusion

EQUIPMENT
EOS M290

MATERIAL
IN 718

TECHNICAL APPROACH

This project is a direct contract with the LIFT Institute (American Lightweight Materials Manufacturing Innovation Institute {ALMMII} – aka LIFT) to provide America Makes support in a multi-institute effort for ONR. Additional participants include NCDMM (America Makes), MxD, and EWI. Several methods are being used to drive activities throughout the project. The first step is improving upon the advanced manufacturing qualification and certification approaches developed for additive manufacturing by the Army and extending to other forms of advanced manufacturing needed to produce a system. Another aspect is to review existing data sets and define the minimum data requirements that would enable verification and/or validation of a data set. The team is also conducting roadmap modeling and predictive analytics to communicate AM design, material, process, and part performance data across platforms. With these approaches in mind, the team is establishing preliminary training for utilization of data sets and establishing a secure data transfer portal.

PROJECT START DATE

July 2022

EXPECTED END DATE

November 2023

EXPECTED DELIVERABLES

- Workshop summary reports
- Digital build log/sample parts
- Test data report
- Final report

FUNDING

\$882,469 total project budget

PROJECT PARTICIPANTS

Project Principal:

American Lightweight Materials Manufacturing Innovation Institute (ALMMII) – aka LIFT

Other Project Participants:

NCDMM/America Makes
MxD
EWI

Public Participants:

U.S. Department of Defense