![MxD — The Digital Manufacturing Institute]

REQUEST FOR INFORMATION

SUBJECT AREA:
High-Volume, Low-Cost Item Serialization

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MXD OVERVIEW

MxD (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 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 partners 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.

REQUEST FOR INFORMATION PURPOSE

The purpose of this request for information (RFI) is to seek information on existing commercial technologies and/or research and development work being done in the RFI titled subject area. Any individual from industry or academia may submit a response to this RFI, MxD membership is not required to submit a response. All parties with information relevant to the RFI titled subject are encouraged to submit a response to this RFI.

MxD will utilize information received to scope projects in this subject area. It is possible that MxD will select and fund organizations who have responded to this RFI to participate on future projects.

RFI SUBJECT: HIGH-VOLUME, LOW-COST ITEM SERIALIZATION

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:

- Quality assurance: In order to trace manufacturing issues discovered post assembly 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.
- 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.

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), electronic tags (RFID) 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 precision 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);
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.

These challenges have been further compounded with industry 4.0 and digital manufacturing where a large amount of digital data is being gathered with IoT and other sensors but cannot be easily associated with a manufactured item. MxD is seeking information on existing commercially available solutions or research being done to overcome the problems outlined herein. With this information, MxD will scope a project for developing a viable item-level serialization solution that can be used in a high-speed manufacturing environment for low cost consumer products.

RFI KEY DATES

Key Dates	
RFI Released	3/6/2019
RFI responses due, early submissions are encouraged to accelerate project scope development and team selection.	5PM CT 4/3/2019

SUBMISSION INSTRUCTIONS

All RFI responses should include:

- Responder information: organization name, individual name, title, and contact information
- Commercial solutions: relevant product overview and specifications
- Research: summary of relevant research being done
- Standards: summary of relevant standards development activity
- Current hardware and software required and approximate cost
- Technology uniqueness and benefits
- Target market and product use cases

All RFI responses should be made electronically to Katie.Tillery-Merk@uilabs.org. Attach a pdf version of your response to your email and please include "RFI Response_<organization name>" in the subject line of the email. Please keep all responses to three pages or less. **Early submissions are encouraged to accelerate project scope development and team selection.**