1415 N CHERRY AVE
CHICAGO, IL 60642
(312) 281-6900
DMDII.ORG
DMDII@UILABS.ORG

DMDII
a UI LABS Collaboration
DIGITIZING AMERICAN MANUFACTURING

DMDII FINAL PROJECT REPORT

Project Team Lead	**University At Buffalo**
Project Title	**DMD-101 Course Development**
Project Designation	**15-08-02**
UI LABS Contract Number	**0220160027**
Project Participants	**Accu-Solve Group**
DMDII Funding Value	**$381,801.00**
Project Team Cost Share	**$611,055.00**
Award Date	**2 December 2016**
End Date	**2 December 2017**

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Project Summary

In this project the Digital Manufacturing and Design Innovation Institute (DMDII) and the University of Buffalo teamed up to produce an online series of courses (or a "Specialization") on Digital Manufacturing and Design ("DM&D-101"). The Specialization was developed to introduce learners to the impact of the digital thread in digital manufacturing. The specialization exposes learners to the effect technologies are having throughout the manufacturing process. Course material developed includes defining and utilizing the digital thread.

DMDII is pleased to offer the DM&D-101 Specialization through Coursera. Coursera, a MOOC platform, has popularized and implemented best practices with academic and industry partners for successful online course development. A specialization is an offering through the Coursera platform for learners to master a subject area through taking a targeted sequence of courses. Coursera is an education platform that partners with top universities and organizations worldwide, to offer courses online for anyone to take for free. Additional information on Coursera can be found at www.coursera.org.

Developing on-line courses through a MOOC process affords DMDII the opportunity to connect across the labor market by customizing material and providing free and unrestricted access to educational training material. This also provides the opportunity to open up the courses to interested parties from the public at large.

"The Employer Potential of MOOCs," a study funded by the Gates Foundation and conducted by Duke University and RTI International,[1] revealed manufacturers would like to use MOOCs for the education and training of their workforce. The Economist recently noted "digitally-delivered courses, which teach students via the web or tablet apps, have big advantages. With low startup costs and powerful economies of scale, online courses dramatically lower the price of learning and widen access to it, by removing the need for students to be taught at set times or places." [2]

The target audiences for the DM&D-101 Specialization are design and manufacturing engineers along with operations managers, primarily working at small medium sized manufacturing enterprises (SMEs) throughout the country that are looking to move into the digital manufacturing realm. These courses are also intended to educate future workers on digital manufacturing that include but not limited to high school, community college and university students that are interested in exploring a career in digital manufacturing or design.

The DM&D-101 Specialization is an educational tool for practitioners to gain an understanding of various aspects and capabilities related to digital manufacturing. As such, it provides a holistic foundation for understanding digital manufacturing and technologies that are used throughout the manufacturing process. Known as the digital thread, or how data is used throughout manufacturing, the courses should provide examples and offer a definition of the digital thread.

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1 "The Employer Potential of MOOCs: A Survey of Human Resource Professionals' Thinking of MOOCs." Duke University & RTI International – Alexandria Walton Radford, Jessica Robles, Stacey Cataylo, and Laura Horn (*RTI International)*; Jessica Thorton and Keith Whitfield (*Duke University)*

2 The Economist. "The Future of Universities: The Digital Degree," June 28, 2014 http://www.economist.com/news/briefing/21605899-staid-higher-education-business-about-experience-welcome-earthquake-digital

Over the course of the year long project, the University of Buffalo and DMDII met with dozens of digital manufacturing subject matter experts from large and small manufacturers, academia, trade organizations and other software service providers. The purpose of these meetings and workshops was to pull in knowledge from a variety of sources to ensure the course materials address multiple perspectives to close the knowledge gap. The Digital Manufacturing & Design Technology Specialization "Understanding Manufacturing's Fourth Revolution" can be found on Coursera's platform at the following location: https://www.coursera.org/specializations/digital-manufacturing-design-technology.