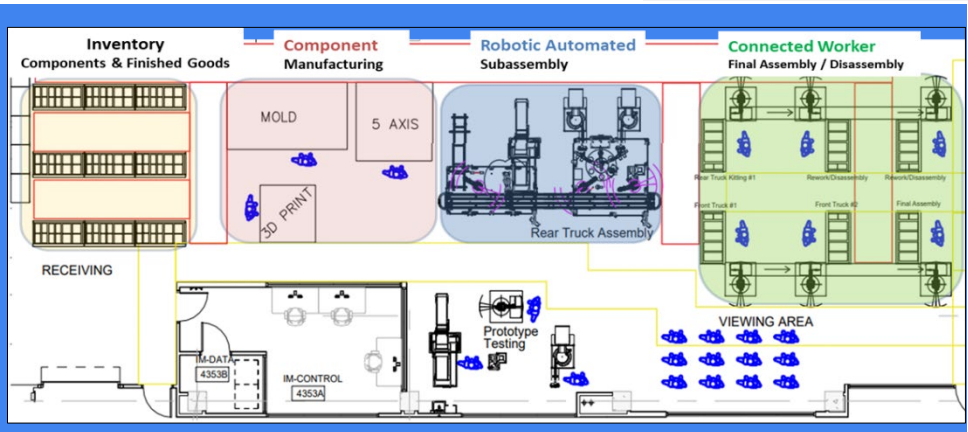
Industry
Manufacturing

Technology
Workforce Development

CESMII
THE SMART MANUFACTURING INSTITUTE

PROJECT CASE STUDY

Engineer of the Future: Preparing the Next Generation Smart Manufacturing Workforce



PROJECT LEAD

Purdue

PROJECT TEAM

Microsoft, Rockwell, PTC, Caterpillar

PROJECT OBJECTIVE

The goal of this project is to develop a comprehensive 4-yr Smart Manufacturing degree program, adhering to Accreditation Board for Engineering & Technology standards.

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Purdue Introduces 4-Year Smart Manufacturing Engineering Degree Program

BENEFITS TO OUR NATION

Research and data from the US Bureau of Labor Statistics shows that between 2018 and 2028, an estimated 53% of open positions will be unfilled due to a skills shortage in the smart manufacturing workforce. Failure to address this problem is estimated to cost the US economy $460 billion annually. Implementation of Purdue's Smart Manufacturing Engineering degree program will produce a skilled workforce that will directly address this issue. Graduates of the Purdue program will possess expertise in cutting-edge technologies, such as Industrial IoT, machine learning, and data analytics, enabling them to immediately address American manufacturer's needs.

BENEFITS TO INDUSTRY

The Smart Manufacturing Degree program at Purdue will produce a steady stream of highly trained professionals adept in the latest technologies that are crucial for modern manufacturing. Graduates will bring fresh insights and skills to the industry, enabling companies to enhance productivity, reduce costs, and improve quality. This new degree program aligns perfectly with the industry's evolving needs, promoting innovation and competitiveness. It's a strategic investment that ensures American manufacturing remains at the cutting edge, guaranteeing sustained growth and vitality in a competitive global manufacturing environment.

PROJECT DESCRIPTION

TECHNICAL APPROACH

Purdue University has recruited and established strategic partnerships with key stakeholders to guide in the design and development of an accredited BS degree program that incorporates Industry 3.0 core concepts with the data driven strategies, capabilities, and technologies of Industry 4.0. Reference frameworks developed jointly by Purdue and its partners will be used in development of this project and the BS degree.

ACCOMPLISHMENTS

- Developed 4-Year Degree Program and Curricula
- Designed Enterprise Architecture:
  - Cloud/Edge Architecture
  - Network Architecture
  - Security Infrastructure
- Designed Scale Model Continuous Process Manufacturing Line
- Developed Smart Manufacturing Learning Activities

DELIVERABLES

- Delivered Complete Engineering Design Schematics for all Course Learning Systems and Laboratories
- Delivered Detailed Design for enterprise architecture and network infrastructure for all learning facilities
- Delivered Courses, Plan of Study and Documentation Package for 4-year Smart Manufacturing Engineering Curriculum

REUSABLE OUTCOMES / SM MARKETPLACE

- Courses, Plan of Study and Documentation Package for 4-year Smart Manufacturing Engineering Curriculum
- Course curricula and learning activity plans for
  - Smart Factory
  - Industrial IoT
  - Continuous Process Control
  - Smart Foundry

RESULTS

12

Developed 12 new manufacturing engineering courses that comprise the core of the Smart Manufacturing Industrial Informatics BS degree program.

2,500 SF

Designed infrastructure and equipment for 2,500 square foot Intelligent Process lab.

2,000 SF

Designed infrastructure and equipment for 2,000 square foot Industrial IoT lab.

PROJECT DETAIL
Budget Period: BP4 – BP5
Submission Date: 1/16/2023
Sub-Award (contract) Number:
4550 G YA226
SOPO: 2321

FOR MORE INFORMATION CONTACT
Name: Ragu Athinarayanan
Position: Professor
Phone: 765-494-0448
Email: rathinar@purdue.edu

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