The Ohio State University's Center for Design and Manufacturing Excellence (CDME) actively engages with manufacturing companies of all sizes to help them overcome product development challenges. The experienced staff at CDME provides clients with product development, commercialization, engineering design, and innovation of commercial products based on the practice of translating basic research into application. Engineering, testing, and associated services are offered to develop the most high-tech, innovative, and competitive product.

**CLIENT ENGAGEMENT**

As an industry-facing center, CDME strives to move at the speed of industry while retaining the innovative culture of the university. Contracts are simple and industry friendly. Any IP developed as part of the project is assigned to the client.

**MARKET ANALYSIS**

CDME works with clients to ensure proper market and value proposition analyses have been undertaken to validate the investment in product development. Complete landscape analysis, voice of the customer, and value proposition development help ensure success.

**PROJECT DEFINITION AND PROGRAM MANAGEMENT**

CDME works closely with clients to develop a project which emphasizes the development/improvement of the product in the most effective and efficient manner. Projects are managed by an industry-experienced program manager executed via a detailed statement of work. Projects are milestone-driven with defined success criteria and deliverables.

**PRODUCT DESIGN**

Product development and/or improvement is a foundational element of CDME. The center's staff represents product development professionals from a number of manufacturing industry verticals. CDME utilizes commercial, mechanical, and electrical design software comparable to those used at most client facilities. All digital work packages and project material are owned by the client and delivered at the end of the project.

**AGILE MANUFACTURING**

CDME has developed agile manufacturing practices to allow clients to respond more quickly and efficiently to customer needs and market conditions. CDME designs and fabricates novel and innovative manufacturing-related tools which allow clients to design based on functional performance requirements and not be constrained by existing manufacturing processes. Examples include novel and custom dies, molds, patterns, jigs, and fixtures.

**DESIGN FOR MANUFACTURING**

Design for manufacturing (DFM) is a comprehensive system which considers the end manufacturing process when designing new products. Staff at CDME employs DFM methodology when defining new product development/improvement projects. The center has embraced many of the key tenants of DFM which include:

- Minimizing the number of components
- Using standard, commercially-available components
- Using common parts across product lines
- Designing for ease-of-part fabrication
DESIGN FOR MANUFACTURING CONTINUED
- Designing parts with tolerances within process capability
- Designing products to be foolproof during assembly
- Minimizing use of flexible components
- Designing for ease of assembly
- Using modular design
- Shaping parts, products for ease of packaging

PRODUCT IMPROVEMENT ANALYSIS
Clients who seek to maximize profitability margin or increase functionality of an existing product can work with CDME to identify cost savings through component reduction, replacement, or redesign.

Product improvement services include:
- BOM analysis
- Component capability cost-swap analysis
- Redesign for efficient production
- And other similar analyses

PROTOTYPING
New product and process functional prototyping is a core competency of CDME. CDME houses or has access to resources required to create fully operational prototypes across a large range of manufacturing industries from medical devices to innovated welding systems. Employing DFM methodology, we ensure that a prototype fulfilling form-fit-function-feasibility requirements are able to be manufactured at scale.

Equipment at CDME used for prototyping
- 3D printing (all types)
- Injection molding
- Die casting
- Machining
- Hydroforming
- Pressing
- Stamping
- Vacuum forming
- Welding
- Electronic design systems
- Multi-layer PCB production
- Pick and place electronic systems

TESTING
CDME houses a number of mechanical and electrical testing systems which are utilized in quality testing of client projects. Additionally, we have access to additional testing systems throughout the university.

Sample testing processes to ensure mechanical integrity of the product include:
- Tensile
- Compression
- Shear
- Peel
- Cyclic
- Tear
- Bend
- Fixture
- Our electronics testing equipment allows for hardware in the loop simulation, vibration, and heat testing.

PILOT MANUFACTURING
Small-batch manufacturing is performed as available in our pilot manufacturing plant. Product design, development, and prototyping projects assigned to CDME receive priority for this service. Our suite of industrial-grade mechanical and electrical manufacturing equipment grows daily and is available to help manufacturers and OEMs execute pre-production and short-run orders (500-1,000 pieces).

The Center for Design and Manufacturing Excellence (CDME) is the manufacturing port of entry into Ohio State. CDME is The Ohio State University’s preeminent leader in innovative applied research for product design, technology commercialization, and manufacturing for industry. Our center is an Ohio Manufacturing Extension Partner affiliate.

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