

Operations Strategy for the Mass Customization of Additively Manufactured Orthopedic Products



BUSINESS PROBLEM

Additive Manufacturing has been suggested as an enabler for mass customization within personalized healthcare. Additive manufacturing could reduce cost or lead time in production of components historically only manufactured by subtractive methods. What are the portfolios (i.e., types of implants, models & guides), technologies (i.e., DLMS, polymer FDM, etc.) and business models (centralized, micro-factories, , etc.) available to build a mass customization portfolio offering for patients? In addition, what unique value proposition can a MedTech company provide surgeons and/or hospitals with the operation of printers at or near point-of-care?

DATA SOURCES

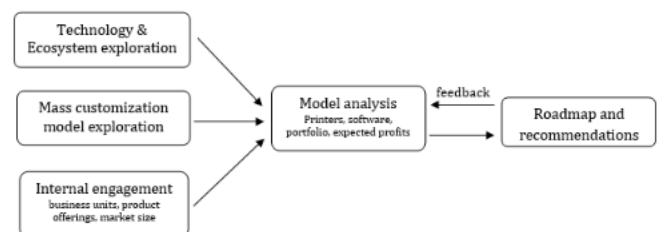
Data includes: (1) Process flow maps describing the manufacturing process of custom orthopedic products (2) labor and equipment costs associated with the manufacturing of orthopedic products (3) Estimated market share for custom implants, guides, and models

Data Types and Format

(1) Cost and lead time information associated with various manufacturing equipment. (2) Labor time and costs.

APPROACH

Three steps: (1) data collection: review the production models of companies that use additive manufacturing for mass customization and interview internal stakeholders to understand implant design needs. (2) Analysis: evaluate what business model will maximize efficiencies for mass customization. (3) Strategy road-mapping: present a strategy for various operations models for mass-customization.



IMPACT

The solution will provide insight into the effects of mass customization via additive manufacturing within Medtech, specifically within the design and manufacturing of implants, surgical guides, and anatomical models.

DRIVERS	The industry is seeing a drive towards mass customization, but most products/companies only solve a subset of the problem. This project was driven by the fact that idea that it could be the first end-to-end mass customization solution within MedTech.
BARRIERS	The biggest barrier was the lack of accessible market data to determine the best long-term operations approach. There is little information on the extent to which customized products are desired by customers
ENABLERS	This project was enabled by the knowledge and expertise but the additive manufacturing and orthopedic industries.
ACTIONS	Since this is a long-term strategy implementation consisted of educating people into how to use the model and recommending the next steps.
INNOVATION	The solution allows for the simulation of a range of possible operations strategies, ultimately enabling a fast analysis into a seeming complex solution.
IMPROVEMENT	The solution provides a tool that can be used to gain better insight into how to approach mass customization.
BEST PRACTICES	If replicating the solution, be diligent during the data collection. Information throughout the industry is apparent, but not always easily accessible.
OTHER APPLICATIONS	Any industry or company interested in using additive manufacturing for the mass production of custom products