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# Adoption of 3D-Printing Technologies in Manufacturing: An Empirical Analysis

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## Abstract

Current manufacturing literature discusses the potential for 3D-printing to optimize both operations and supply chain management performance. In addition various countries have invested heavily in encouraging the adoption and use of 3D-printing in manufacturing. Despite this, very little current literature exists on addressing the question: what impacts 3D-printing adoption? Through the use of diffusion of innovations theory and unified theory of acceptance and use of technology, this study addresses three research inquiries. 1. Does top-management adoption category impact 3D-printing speed of actual adoption as well as speed of potential adoption in manufacturing? 2. What are the main drivers of intention-to-adopt 3D-printing in manufacturing from the perception of top-management on the innovation? And 3. Does top-management perceptions differ based on adoption category in the context of 3D-printing adoption? Survey analysis was used to examine these questions with 270 top-management representatives from manufacturing firms across the United States. The results provide evidence that top-management adoption category impacts potential speed of adoption. In addition the results provide conflicting evidence on the role of complexity and effort expectancy in intention-to-adopt 3D-printing. Post-hoc moderation analyses suggest innate individual characteristics of top-management play a role in the impact of these perceptions on intention-to adopt 3D-printing.

Keywords: 3D-printing technologies; innovation management; manufacturing strategy

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