In new book, researchers address challenges of adopting additive manufacturing

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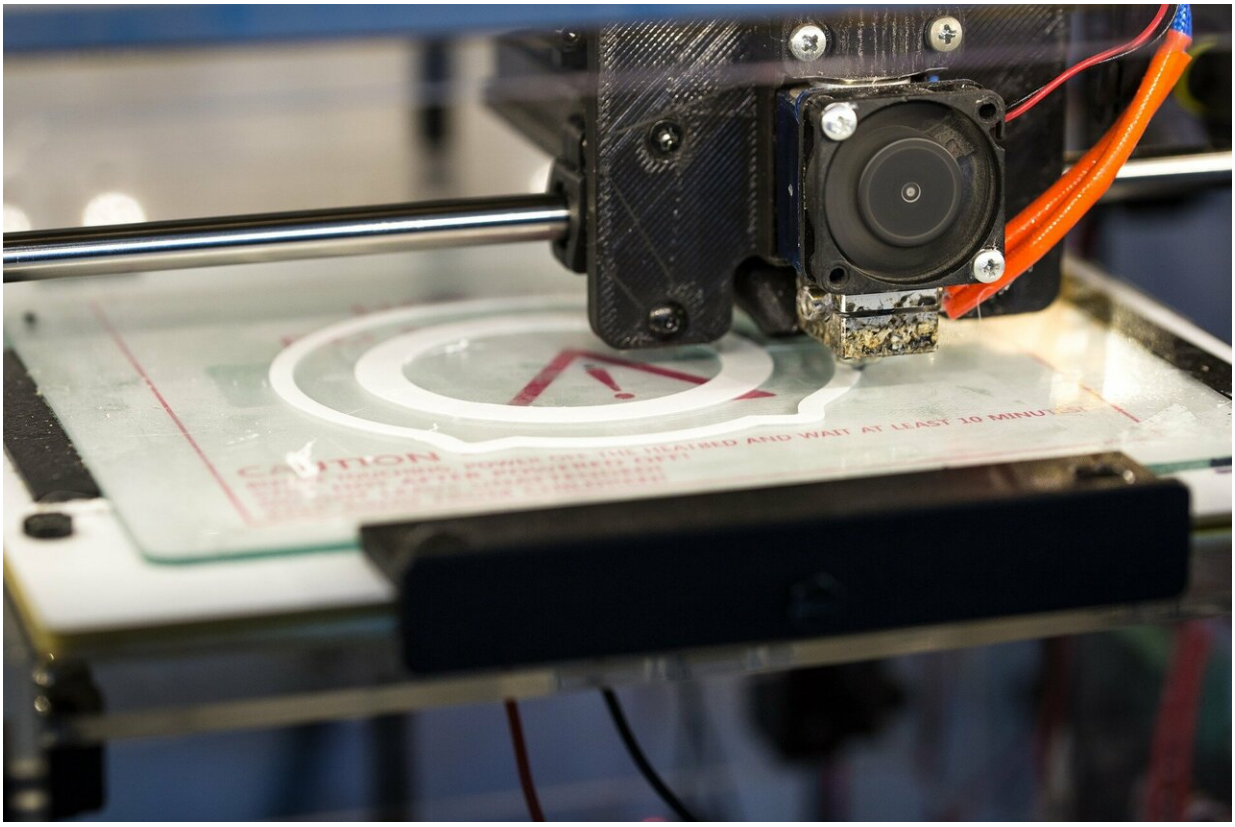

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Additive manufacturing holds promise as a speedier, less costly and more effective method to fabricate parts for a wide array of industries, from aerospace and automotive to healthcare and construction. But while

the technological advances of this 3-D printing technique attract attention, executives in industry remain uncertain – even skeptical – about adopting the new technology in favor of traditional, time-tested approaches.

A new book written by a Missouri S&T researcher, her former doctoral student and the vice president of an additive manufacturing (AM) startup offer guidance for C-suite types uncertain of whether to join the AM revolution or wait until its adoption becomes more widespread.

In *Additive Manufacturing Change Management: Best Practices*, Dr. David M. Dietrich, Michael Kenworthy and Dr. Elizabeth A. Cudney present what Cudney calls a "road map" for business leaders wanting to introduce AM into their processes. The book, published by CRC Press, will be released Friday, Feb. 22.

"If company leaders are interested in bringing additive manufacturing online, this book can help them decide if it makes sense for their industry," says Cudney, associate professor of engineering management and systems engineering at Missouri S&T.

While AM gets a lot of buzz in industry press, the technology is so new that few organizations have the expertise to implement it, says Cudney. Executives typically ask their project management teams to figure out how to incorporate AM within their companies, and those managers turn to technical experts for guidance and often end up overwhelmed by a deluge of technical information, she says. Additive Manufacturing Change Management focuses solely on implementing AM from the management side and is intended for managers, not technical staff, Cudney says.

"Industrializing AM is a complex undertaking and involves far more than acquiring machines and placing them in a building with a few newly

trained operators and engineers," write Dietrich, Kenworthy and Cudney in the introduction to their book. Leaders, they add, "must ensure that the team is maintaining a broad view of the value AM can bring to the business."

"Barriers holding AM back from becoming a widely adopted manufacturing technology within industry had just as much, if not more, to do with business and organizational challenges than technical challenges," says Dietrich, who earned his Ph.D. in engineering management from Missouri S&T in 2010. "This book identifies those barriers and provides tools to directly address those barriers."

Dietrich, the Additive Manufacturing Engineering Design Fellow for Honeywell Aerospace, contributed several "war stories" to the book. He describes them as "real-life examples the authors faced in the aerospace industry as we have tried to industrialize or 'production-harden' AM technology over the past years." Many were gleaned from his experiences in industry.

While company names and specific individuals are not referenced, the lessons learned are real. "The intention of describing these past events is hopefully to educate managers and prevent other companies from making the same mistakes," Dietrich says.

One vignette, subtitled "suckers for sunk costs," describes "one company's efforts to purchase AM machines to stay ahead of competition without a true understanding of the benefits of the technology nor a specific roadmapping strategy in mind on how to develop their product lines for AM."

These stories illustrate some of the stumbling blocks managers encounter when trying to introduce new processes or technology, Cudney says.

"There's often a lack of planning, a lack of understanding, a resistance to change and sometimes fear of the unknown," she says. "Our hope is that this book will provide a good road map for managers to advance additive manufacturing at a faster pace."

For her part, Cudney focused mainly on discussing "management philosophies" related to introducing new technology that can be applied to a range of industries. Her 10-plus years of private-sector experience in the automotive industry provided additional real-world context for the book.

"We wanted to take a look at how companies can roll out a new technology, new processes and equipment and integrate that in such a way that you have a good product in the end," Cudney says.

Additive Manufacturing Change Management: Best Practices is the latest book in CRC Press's Continuous Improvement Series of books.

More information: Additive Manufacturing Change Management: Best Practices. www.crcpress.com/Additive-Manu … p/book/9781138611757

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