Unlocking the Potential of Advanced Manufacturing Technologies
By: Kenneth Boyer, Keong Leong, Peter Ward, Lee Krajewski
Citation: Journal of Operations Management, 15 (4), 1997, 331-347

This research examines whether investments in advanced manufacturing technologies (AMTs) such as flexible manufacturing systems, computer aided design, computer aided manufacturing, robotics, etc., are more likely to lead to improved performance if they are supported by improvements in the manufacturing infrastructure of the company. Three measures of infrastructure improvements are used: quality leadership (the degree of managerial commitment toward building a supporting infrastructure), worker empowerment (giving workers training and responsibility), and soft integration (facilitation of communication among different functions and workgroups). Performance is measured in three different ways: growth, profits, and flexibility. Data was collected from over 200 U.S. metal-working firms.

The findings show that investments in infrastructure contribute to improved performance, regardless of a plant's technological focus. Investments in infrastructure are of even greater importance when investment in AMTs is heavy. High technology plants realize an even more dramatic return on investments in infrastructure than do their low technology counterparts. In contrast to investments in infrastructure, investments in AMTs by themselves have relatively little effect on performance. While AMTs offer powerful capabilities for manufacturers, those capabilities can only be fully realized when companies also invest in infrastructural programs.

The Center for Excellence in Manufacturing Management provided financial support for this research.