The impact of advanced analytics and data accuracy on operational performance: A contingent resource based theory (RBT) perspective

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Abstract

This study is interested in the impact of two specific business analytic (BA) resources—accurate manufacturing data and advanced analytics—on a firms' operational performance. The use of advanced analytics, such as mathematical optimization techniques, and the importance of manufacturing data accuracy have long been recognized as potential organizational resources or assets for improving the quality of manufacturing planning and control and of a firms' overall operational performance. This research adopted a contingent resource based theory (RBT), suggesting the moderating and mediating role of fact-based SCM initiatives as complementary resources. This research proposition was tested using Global Manufacturing Research Group (GMRG) survey data and was analyzed using partial least squares/structured equation modeling. The research findings shed light on the critical role of fact-based SCM initiatives as complementary resources, which moderate the impact of data accuracy on manufacturing planning quality and mediate the impact of advanced analytics on operational performance.

The implication is that the impact of business analytics for manufacturing is contingent on contexts, specifically, the use of fact-based SCM initiatives such as TQM, JIT, and statistical process control. Moreover, in order for manufacturers to take advantage of the use of data and analytics for better operational performance, complementary resources such as fact-based SCM initiatives must be combined with BA
initiatives focusing on data quality and advanced analytics.

Keyword: Supply chain analytics  Data accuracy  SCM initiatives  Moderating effect  Mediating effect  GMRG