

# Reducing Expenses, Increasing Profits

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A University of Arkansas researcher studied 123 manufacturing firms -- high-tech and non-high-tech -- and found that implementation of information-technology-based supply-chain management systems has an overall positive impact on a company's financial performance.

"Our results suggest that inventory turnover improves and overall profitability increases when firms use these IT-based systems," said Vernon Richardson, professor of accounting in the Sam M. Walton College of Business. "This was especially true for high-tech companies. They had correspondingly higher return on sales, which confirmed our prediction that, because of the competitive nature of high-tech industries, companies in this category would enjoy greater financial performance by implementing IT-based systems that coordinate and integrate the flow of materials, information and finances from suppliers to manufacturers, manufacturers to wholesalers, wholesalers to retailers and retailers to consumers."

High-tech companies exist in a hypercompetitive business environment. With dizzyingly short product and service life cycles, these firms seek tools that will help them respond quickly to customer demands and gain significant time and cost advantages over competitors.

Previous research has demonstrated that investments in information technology for supply-chain management are associated with improved firm performance. However, these studies used only data reported by survey respondents. Richardson, Bruce Dehning at Chapman University and Robert Zmud at the University of Oklahoma worked with externally

reported, audited and publicly available financial information. They examined overall performance metrics, such as return on investment and return on sales and market share, and, unlike previous research, they studied specific measures of business processes in all areas of the supply chain.

Richardson and his colleagues examined performance measures for the year prior to firms' adoption of an IT-based system and for each of the two years after adoption. Of the 123 firms studied, 36 were classified as high-tech companies. Fourteen of these were computer and office-equipment companies and nine produced electronic components or semiconductors.

The researchers studied four "processes," each a critical link in the supply chain:

- Inbound Processes -- procurement or purchasing
- Operational Processes -- manufacturing assembly and packaging
- Outbound Processes -- distribution, delivery, marketing, sales and service
- Support Processes -- technology development, human resources and firm infrastructure

They developed hypotheses, or predictions, related to each process. For example, they predicted that firms that adopt IT-based supply-chain management systems would have improved performance in inbound processes as reflected in an increased turnover of raw materials and increased gross margin. Likewise, they predicted that an increased turnover of finished goods due to adoption of the technology would improve performance in the five outbound processes. The researchers also predicted that adoption of an IT-based supply-chain management system would lead to overall improved financial performance because of increases in return on assets, return on sales and total-inventory turnover.

Analysis of financial-performance data revealed improvements in all but one of the processes. The researchers observed strong results on inbound and outbound processes. In other words, implementation of IT-based supply-chain management systems had a positive effect on procurement of materials before production, and on distribution, marketing and sales after production. Richardson and his colleagues observed moderate improvements for support processes. Financial performance data showed that use of information-technology systems for the supply chain had little effect on operational processes.

"We think the reason for this is that IT-based supply-chain management systems primarily enable firms to better coordinate interactions with external partners -- the so-called inbound and outbound processes -- rather than contributing to the process of manufacturing and assembly," Richardson said.

Throughout the supply chain, IT-based management systems improved inventory turnover, which has a direct impact on profitability. The researchers also provided evidence that the information systems reduced general, sales and administrative expenses, which increased firms' return on assets. Overall, the combination of these effects had a positive impact on firms' overall performance.

"By examining the change in financial performance from pre-adoption to post-adoption and controlling for industry median changes in performance, we found that supply-chain management systems reduce expenses and increase important business measurements, such as gross margin, inventory turnover, market share and return on sales," said Richardson.

The researchers' study was published in the *Journal of Operation Management*. Richardson holds the Ralph L. McQueen Chair in Accounting in the Walton College.

Source: University of Arkansas

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