

An academic group reports that companies deploying RFID across an entire supply chain or business enterprise realize substantial gains, though a "wall of silence" keeps them from sharing their success stories.

By Claire Swedberg

Nov. 23, 2009—A study written by four university professors finds that radio frequency identification offers a significant benefit to companies that fully deploy the technology across their entire business operations or supply chain. However, the study also finds that while RFID is gaining momentum when it comes to automating businesses' operational and management functions, few firms have reached the "transformational" stage at which RFID is deployed across multiple operations and departments within a company, as well as across its partners. Only when businesses fully employ the technology across their own operations and those of their partners, the study's authors maintain, can RFID provide them with a true competitive advantage.

The study, entitled "Empirical Evidence of RFID Impacts of Supply Chain Performance," is based on a review of published news articles and scientific papers focused on RFID deployments, particularly in the supply chain. The articles and papers had originally appeared in a range of publications and Web sites over the past 10 years, including *RFID Journal*, *The Wall Street Journal*, the [International Journal of Retail & Distribution Management](#) and the [Journal of Information Systems](#). Authored by professors at [Bryant University](#), the [University of Houston](#) and [Baylor University](#), the study is slated to appear in the latest issue of the [International Journal of Operations and Production Management](#).

The essential "transformational" phase identified in the study has not yet arrived among most deployments researched for the study, the authors indicate. However, says John Visich, the study's lead author and an associate professor of management at Bryant University, many such deployments may be in place, but hidden behind a "wall of silence" in which companies choose to keep the technology and their use of it to themselves. Despite that obstacle, Pedro Reyes, a Baylor University associate professor of operations management who co-wrote the study, predicts that within five to eight years, RFID technology will have reached that transformational phase at many businesses, such as hospitals, logistics providers and retailers.

In the meantime, says study co-author Suhong Li, a Bryant University associate professor of computer information systems, RFID users and vendors need to think about the big picture. Instead of focusing on small deployments that address issues like retailer mandates, companies—and the vendors that provide them with RFID technology—need to consider the entire business process, and examine how an RFID system could be used to improve it.

The study originated from conversations between Visich and Reyes, regarding a lack of evidence as to the amount of RFID being used in business, and about how well the technology performs. The two professors "had been working in parallel for several years," Reyes says, and decided to create a study that would not only collect data but convert it into useful information about deployments and how

successful they had been.

Over the course of two years, Visich and Reyes, along with Li and Basheer M. Khumawala, of the University of Houston, analyzed dozens of RFID-related articles and papers, examining the operational and management sides of businesses, and defining deployments by the automational, informational and transformational effects RFID technology use had within these two categories. The researchers cite the limitations of their research, including the use of secondary sources and a lack of consistency in performance-measurement definitions, but they believe their findings are important nonetheless.

In the case of operations, the research team found that of the 55 RFID deployments described in these articles and papers, all were examples in which RFID provided operational business value, and 47 resulted in automational effects—meaning that formerly manual activities (such as inventory checks) were automated through the use of RFID. Five of the 55 deployments saw information effects—that is, the deploying companies were analyzing and utilizing data culled from RFID technology to make better decisions, such as when inventory needed to be ordered, while only three had reached a transformational stage at which they saw an effect across multiple processes—such as sharing information with other divisions of a company, or with other members of a supply chain.

The researchers also found that for 15 of the 55 deployments, RFID had an effect on management processes. All 15, Visich says, were in the informational phase, meaning they were using data for analytical purposes, such as for planning the movement of promotional displays at the appropriate time, based on advertising.

The study also found that while most companies had installed RFID systems only to address a specific activity, such as tagging cartons destined for RFID-enabled retailers like [Wal-Mart](#), such limited-scale deployments yielded little benefit. Business consulting firm [Bain & Company](#)'s 2005 and 2007 Management Tool surveys, quoted in the study, found that users of RFID ranked the technology as one of their least favorable management tools when they used it in piece-meal efforts (such as the slap-and-ship application of RFID tags), while those with transformational deployments ranked RFID as one of their most effective tools.

With the transformation effect, the Bryant study found that RFID can benefit a company across a wide variety of functions, including increasing sales and improving retail promotions coordination, reconciliation, decision-making effectiveness and quality, resource usage and production control. However, Visich says, the transformational stage requires that firms use innovation and supply chain redesign to achieve a competitive advantage. Once users reach that stage, Reyes predicts, RFID technology will "revolutionize supply chain dynamics."

Companies seeking to utilize RFID for a specific function—such as inventory control—need to think about how the technology can be used across their entire operation, Visich says. They also need to consider how RFID may impact other processes, he notes, such as speeding one process while creating a logjam elsewhere.

University Researchers Say RFID's Worth Is Proven When Deployed Enterprise-wide

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"Implementation is still in the early stages," Li states. "Many companies are simply looking at it as an added cost," she says, to accomplish such things as meeting a Wal-Mart mandate. "Because they are implementing it for a single entity, not across the whole supply chain, they are not seeing the whole benefit." Most deployments begin with a single entity, Visich notes, but companies need to have the bigger picture in mind if they hope to eventually see benefits. "Vendors should not make a business case for RFID to improve one process," he says. "It's not going to look like a favorable investment. RFID can be deployed across multiple processes."

One obstacle for businesses in realizing RFID's potential, Li says, is the inability to use the large volume of data that comes from RFID hardware. Vendors would serve their customers well by providing the proper tools for analyzing the information. Too many vendors, she says, offer limited solutions, such as only hardware, software or integration, but not end-to-end solutions. "Vendors may say, 'I will help you meet the mandate,'" she says, "while they should be helping [clients] develop a better application to use the technology to its full potential."

The "wall of silence," Visich says—created when businesses refuse to make public any information regarding their RFID deployments—will continue to be another obstacle to RFID technology usage. Those utilizing the technology most successfully are the ones least likely to share their results, he says. "When you reach the transformational level, it's a competitive advantage," he explains. "I don't know how you get companies to share their information." Reyes adds: "It would be helpful if companies would talk about the lessons learned," especially in health care, in which RFID deployments are numerous but little information is shared among different organizations.