

# Trends and challenges in RFID implementation

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Immense interest has been generated around radio frequency identification (RFID) technology over the last several years. Though the technology has been in existence for decades, its application had been limited for most of these years. But now, thanks to newfound and revolutionary applications such as supply chain management and asset tracking, it is currently one of the most promising – and problematic – technologies.

Industry participants expect this market to grow explosively in the next 18 – 24 months. The growth of the RFID technology market is expected to be driven by different factors such as mandates from retail houses, possible cost savings due to better visibility of inventory and governmental and/or regulatory body pressures.

RFID is disruptive to existing systems and processes. Some of its aspects call for complete process reengineering. Its implementation calls for a paradigm shift in the way business is conducted with channel partners and customers. Investment in RFID has strategic implications on businesses.

RFID technology has the potential to affect all businesses that are dependent on a physical supply chain. Businesses have started to realise the benefits that RFID can provide, such as increased visibility of supply chain, better inventory management and item tracking capabilities.

Markets are gradually waking to the fact that RFID technology is more than just the next step from barcodes or another data generating sensor-based technology. Apart from supply chain management, there are a large number of other potential RFID applications like electronic toll collection and physical access control that are gaining interest. In any market with a high need to track items in real time there is strong potential to benefit from RFID deployment. By using RFID in conjunction with global positioning systems, logistics and transportation companies can provide their customers with information on exact location of containers. Such ability would, in certain cases, help their customers optimize their supply chain.

## RFID mandates

One of the key early market drivers for RFID adoption has been mandates from the likes of retailing giant Wal-Mart and the United States Department of Defense.

Wal-Mart announced in 2003 that it would require its top 100 suppliers to become RFID compliant – by tagging at the case and pallet level – by January 1, 2005. Other major retailers soon followed Wal-Mart's lead.

The US Department of Defense required its 43,000 suppliers to put passive tags on cases, pallets and items costing \$5,000 or more. An estimated 45 million items are covered by this mandate.

The impact of mandates from the likes of Wal-Mart, the US Department of Defense and the US Food and Drug Administration (FDA) are not impacting the automotive and transportation sectors as heavily as other vertical markets.

A recent survey of 500 end-users commissioned by the Computing Technology Industry Association (CompTIA) and conducted by Frost & Sullivan, a global leader in strategic growth consulting, found that within the automotive sector, 15 percent of organisations said they are impacted by the DOD mandate,

12 percent by the FDA directive and 9 percent by Wal-Mart. The numbers are even smaller for companies in the transportation and logistics market: 9 percent each for FDA and Wal-Mart mandates; and just 6 percent for DOD.

At the same time, however, the auto, logistics and transportation industries are among the most aggressive sectors in their plans for RFID deployments, the survey found.

Just over one-half of more than 500 organisations surveyed in North America have either completed RFID implementations or plan to do so within the next 12 months. This includes companies that are evaluating, pilot testing, implementing, or currently using RFID. The most aggressive adoption is planned in the automotive industry, where 59 percent of companies surveyed said they will deploy the technology over the next 12 months. The consumer goods industry and the transportation and logistics sectors were close behind, at 58 percent each.

The automotive segment also leads the way in planned spending on RFID training, allocating 20 percent of its total RFID investment for training and hiring. By comparison, the logistics/transportation industry plans to use 17 percent of its total RFID spending on training and hiring.

## Challenges ahead

The CompTIA/Frost & Sullivan study also brings to light the various challenges ahead, both for vendors and end-users.

The single biggest barrier to adoption of RFID technology remains the cost of implementation, according to the CompTIA/Frost & Sullivan end-user survey. Out of all the components that make up the costs of implementation, tag cost is still the most prominent.

When RFID began to take hold in the automotive manufacturing industry in the mid- to late 1980s and early 1990s, tags were priced at over \$25 per piece. Today, tags are currently available for as low as 20 cents per tag. But that price level is still much higher than many industry participants expected. With mandates and regulatory authority directives driving the market, resulting in higher volume orders for tags, many RFID pundits forecast prices of 5 cents per tag or lower. It now appears that it will take another 6–7 years for tag prices to reach that level. High tag prices remain an impediment in achieving a faster return on investment.

Another critical barrier to broader adoption of RFID is the low awareness levels and the challenges of skills development, especially as this will form the basis of the technology adoption in any organisation.

The level of understanding of RFID technology is low across all vertical markets. Two-thirds of all respondents said they are still learning about the technology; while 26.3 percent said they have an intermediate level of knowledge. The automotive industry recorded a slightly higher level of intermediate knowledge, at 33 percent, while the transportation market, at 28 percent, was slightly higher than the average for all industries.

Clearly the low knowledge and understanding of RFID among employees, consultants and contractors is a critical factor inhibiting adoption. Why the skills shortage? There are a few key elements to consider.

RFID systems are complex and difficult to install and integrate. From the physics of the hardware installation to the challenges of integrating RFID-generated data with existing business processes, a broad base of expertise is required for successful implementation. Professionals working in RFID installations, operations and maintenance must have proficiency in areas such as radio frequency (RF) technology; RFID hardware (antennas, tags, readers); how to properly tag pallets, cartons and products; and RFID standards.

The radio technology skills necessary to implement RFID solutions are not widely present among IT professionals today. This includes both the understanding and skills on radio technology as well as the software, business process and data architecture skills.

The bottom line is that the RFID skills shortage must be addressed to avoid the “disenchantment” valley of the adoption curve that may occur in the next 2-to-3 years. Gartner Group definitely envisions this disenchantment and disillusionment. They believe “at least 50 percent of RFID projects are likely to fail.”

## Facing the challenges

The RFID industry is coming together on several fronts to address the skills shortage. Today there are a variety of “boot camps” teaching basic RFID skills. RFID vendors are offering product-specific product training to their partners. In many cases, however, these vendor-specific training courses do not reflect common foundational knowledge of RFID technology.

We are beginning to see interest by academic institutions and commercial training in offering introductory RFID training.

Yet more work needs to be done. Given the current state of industry RFID skills, there is a pressing need for:

- A standardised, industry-directed curriculum to enable broad-based training and education by academic institutions, commercial training companies so training organisations know what needs to be trained upon at a foundational level.
- A way of measuring an individual’s expertise against that curriculum.
- Wide industry acceptance of the curriculum and skills measurement criteria.

- An individual skills certification to validate that an individual has the knowledge and skills necessary to implement RFID solutions.

CompTIA is currently working with more than 20 organisations with leadership positions in the RFID arena to develop a professional certification to address the skills shortage by establishing an industry accepted credential that validates an RFID technician’s knowledge and skills in the areas of installation, maintenance, repair, and upkeep of hardware and software functionality of RFID products.

What are the benefits of a vendor-neutral, foundation-level RFID certification? An individual skills certification on RFID technology will take costs out of the education process by eliminating the duplicate or redundant training that might otherwise be delivered by multiple channel partners.

The certification will also take costs out of the education process by providing a pre-built curriculum for internal training.

The RFID certification will take costs out of the recruiting and hiring process by providing a measurement of individual’s skills – the certification is a reliable predictor of employee success.

The RFID certification will take costs out of the partnership process by enabling the evaluation of a partner’s, or potential partners’ capabilities. The certification provides a standard way of measuring competency – a benchmark. Partnering programmes can focus on delivering vendor-specific education and certifications without having to deliver foundational level RFID education.

A certification will help enable the industry to deliver more RFID implementations, producing more revenue for the industry as a whole and the companies using the certification. The skilled workforce will be capable of delivering a greater number of implementations and there will be higher customer satisfaction with the delivered solutions.

As an industry, the certification will help avoid the “valley of disillusionment” associated with the adoption of many technologies. The onus is on us as an industry to educate end-users on the basics, the challenges, the process requirements, standards and the returns from RFID.

### ABOUT THE AUTHOR

David Sommer is Vice President of Electronic Commerce for the Computing Technology Industry Association, a global trade association representing the business interests of the information technology industry. He is responsible for developing and implementing the association’s worldwide initiatives in areas such as radio frequency identification and electronic commerce.

### ABOUT THE ORGANISATION

The Computing Technology Industry Association (CompTIA) is a global trade association representing the business interests of the information technology (IT) industry. For more than 23 years CompTIA has provided research, networking and partnering opportunities to its 20,000-plus member companies in 102 countries. The association’s influence extends to all areas of the industry – from providing industry research, networking and partnering opportunities; to developing standards and best practices; to influencing the political, economic and educational arenas that impact IT worldwide. In addition, more than one million individuals worldwide have earned CompTIA professional certifications in the areas of personal computer service, networking, document imaging, Internet, personal computer server technologies, Linux, project management, technical training, e-business, security, and integrated home networks.

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