

Effectiveness of RFID Technology as a Corporate Culture

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ABSTRACT

This paper analyses the Information System/Technology (IT/IS) with special reference to RFID technology and the organizational culture as two closely related issues in any firm. More precisely, we shall see how these two phenomena interact in order to help achieve the purposes of an economic unit. Also in this paper we have suggested some possible improvements in organizational behaviour/culture needed to maximize the efficiency of RFID technology. For this purpose, we have studied the mutual relationships among RFID technology and organizational culture. Then, we focus on how the organizational culture influences this specific process distinguishing between informatic culture and informational culture, the latter being the one allowing an adequate implementation and development of the IT/IS. Finally, we underline the cultural consistency which the implementation of an IS/IT requires.

Many organizations have implemented enterprise-wide applications to integrate data through synchronization and information flows within the organization, and also with trading partners. However, keeping track of data in real-time has been a major challenge with reference to supply chain management (SCM). Radio Frequency Identification (RFID) Technology has been around for decades but incorporating it in the supply chain is emerging as this could provide the answer to these problems.

Keywords: RFID (Radio Frequency Identification) technology, ADC (Automated Data Collection), SCM (Supply Chain Management), EPC (Electronic Product Code), Organizational culture, Information Technology, Information Systems, Organizational Change, Organizational Reinforcement, Informatic Culture.

1. INTRODUCTION

Talk to anyone in the global market about radio frequency identification, and you'll hear that India is a prospective market for the technology. The question is, why would anyone in our country want to adopt RFID? Is it due to existing chaotic supply chain processes, or the lack of visibility regarding the movement of assets, or is it because people want to make their life more comfortable and put their energy to more productive use? There is a special component within any IS, the human one (considered in itself and as interacting with others) which is a must for the success of such IS. This does not merely entail the technical usage of this equipment, but most specifically the qualitative one, understood as organizational behaviour. Within this vision, the notions of informatic and informational culture appear as the main categories that may account for the values shared by corporate members concerning IT/IS.

Corporate culture refers to the shared values, attitudes, standards, and beliefs that characterize members of an organization and define its nature. Corporate culture is rooted in an organization's goals, strategies, structure, and approaches to labor, customers, investors, and the greater community. As such, it is an essential component in any business's ultimate success or failure. Wireless is a method of communication that uses electromagnetic waves rather than wire conductors to transmit data between devices. Wireless networks are telephone or computer networks that use radio frequencies and infrared waves as their carrier. The mediums used in wireless communications are air, vacuum and even water. Signals are normally broadcasted through air and are available to anyone who has a device capable of receiving them. The use of wireless technology as a method of data transport appears very similar to a wired technology. In a wireless media however, signal transmission is unguided and the device communicates without using wires between nodes, instead relying on radio frequencies. Radio waves are normally omnidirectional. When an antenna transmits radio waves, they are propagated in all directions. This means that the sending and receiving antennas do not have to be aligned.

The omnidirectional characteristics of radio waves make them useful for multicasting, in which there is one sender but many receivers. Radio frequency identification is the use of an object (typically referred to as an RFID tag) applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. This means that an RFID device is physically attached to the object that we wish to identify (at a later time). This is known as tagging and the object is said to be tagged. Like bar code, RFID is also an ADC (automated data collection), however, RFID tags don't need to be visible to be read. Barcode reader can only read the barcode one at a time while RFID reader can identify hundreds of tags in its range within fraction of second.

Typical RFID systems are made up of three components: readers (interrogators), antennas and tags (transponders) that carry the data on a microchip. A RFID Tag is the Heart of a RFID System, because it stores the information that describes the object being tracked. A tag is typically composed of an antenna or coupling element, and integrated circuitry. The second major component of RFID systems is the Reader. RFID readers communicate with tags through an RF channel to obtain identifying information. Depending on the type of tag, this communication may be a simple ping or may be a more complex multi-round protocol. Readers come in many forms, operate on many different frequencies, and may offer a wide range of functionality. Readers may have their own processing power and internal storage, and may offer network connectivity. The host computer is generally a desktop or laptop computer, positioned close to the RFID Readers. It receives data from the reader through either wireless or hard-wired connectivity. It then performs data processing and sorts it into a database that is associated with arbitrary records. These records may contain product information, tracking logs, sales data, or expiration dates.

2.INTERACTION BETWEEN FRID TECHNOLOGY AND ORGANIZATIONAL CULTURE

Considering the definitions studied in the previous section, we propose regarding the data, if we bear in mind that RFID Technology is responsible for transforming them into information, it follows that the amount and quality of such data will be a key factor. From this point of view, Southern and Murray (1994) use the term "information-based culture" to express the need for all those involved in data collection to share the idea that an RFID technique must be supported by a good data system (both in the shape of input and output of the IT). In addition to these we must say that, when these data are processed, ethical principles must be considered, which are in turn a result of the general culture existing in the firm. Nevertheless, we should not ignore Proffitt's (1995) warning that organizations and IT which are only supported by data, are static systems whose procedures are based on a control culture which, in itself, does not increase knowledge. Thus, we can see that more elements are required.

3. TYPES OF RFID

Using tags, readers and radio waves to communicate between the two, RFID combined with the EPC (Electronic Product Code) would be able to address these issues and deliver benefits across various processes like manufacturing, distribution, retail, logistics, and security which are emerging as the new corporate culture. This paper focuses on implementing RFID in the value chain and describes technicality behind RFID technology and its impact on various business processes.

There are three main classes of tag, i.e., passive, semi-passive and active. Passive RFID tags have no internal power supply. So they generate power to activate the circuit from the incoming radio frequency signal from the reader and transmit an extremely weak signal back to the reader. Tag contains an antenna, and a small chip that stores a small amount of data. Thus Passive tags have neither their own power source, nor the ability to initiate communication. By contrast semi-passive (or semi-active) tags have an internal battery, but are not able to initiate communications. This ensures that semi-passive tags are only active when queried by a reader. Because semi-passive tags do have an internal power source, they do offer a longer reader range than passive tags, but at a higher cost. Active RFID tags have their own internal power source which is used to power the circuits and to broadcast the response signal to the reader and may initiate communication to a reader or other active tags. Because they contain their own power source, active tags typically have a much longer operating range than passive-tags. A key feature of active tags is that they are able to initiate their own communication with readers. While passive tags have the shortest read range of all three powering types, they are the cheapest to manufacture and the easiest to integrate into products. For this reason, passive tags are the most common tags.

4. WORKING PRINCIPLE

RFID systems consist of three components in two combinations:

- A transceiver (transmitter/receiver) and antenna are usually combined as an RFID reader. A decoder is attached to interpret the data.
- A transponder (transmitter/responder) and antenna are combined to make an RFID tag. The tag has been programmed with information.

An RFID tag is read when the reader emits a radio signal that activates the transponder, which sends data back to the transceiver. The antenna emits radio signals to activate the tag and to read and write data to it. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal. The reader decodes the data encoded in the tag's integrated circuit (silicon chip) and the data is passed to the host computer for processing.

5. OBJECTIVE

The objectives of the study are two-fold:

1. To study the various business applications of RFID.
2. To analyze how RFID technology can be integrated into the corporate culture of an enterprise, primarily focusing on the supply chain.

6. BENEFITS OF RFID

Implementing RFID tags has the following advantages:

- Tag detection not requiring human intervention reduces employment costs and eliminates human errors from data collection,
- RFID tags have a longer read range than barcodes,
- Tags can have read/write memory capability, while barcodes do not,
- An RFID tag can store large amounts of data additionally to a unique identifier,
- Its ability to identify items individually rather than generically.
- Tags are less sensitive to adverse conditions (dust, chemicals, physical damage etc.),
- Many tags can be read simultaneously,
- RFID tags can be combined with sensors,
- Automatic reading at several places reduces time lags and inaccuracies in an inventory,
- Reduces inventory control and provisioning costs,

7. APPLICATIONS OF RFID

The major applications of RFID are listed below:

1. **Inventory control:** Companies are starting to use RFID technology for warehouse applications which range from inventory counting of tagged products to product location and picking.
2. **Library systems:** RFID tags can easily be incorporated into books and other library media. The tags may be applied at source or after manufacturing, for example by the library staff as items are acquired.
3. **Toll collection:** Electronic payment systems, enabled by RFID technology are becoming increasingly popular for road toll collection. An RFID tag is carried by the vehicle and a reader is deployed at each toll collection point. Whenever a tagged vehicle passes through a collection point, it can be detected and identified, and this information is used to levy the appropriate charge for the journey, electronically.
4. **Tagging in the Automotive Industry:** Enormous efforts in the automobile industry are being expended to ensure that the tracking and traceability of all parts are in place for warranty purposed.
5. **People Tracking:** Hospitals and jails are most general tracking required places. Hospitals use RFID tags for tracking their special patients. Many jails in US use RFID tracking systems to keep a close eye on jail inmates.
6. **Document Tracking:** Availability of large amount of data and documents brings lots of problem in document management system.
7. **Healthcare:** Patient safety is a big challenge of healthcare. Reducing medication errors, meeting new standards, staff shortages, and reducing costs are the plus points of use of RFID solutions.
8. **Manufacturing:** RFID technology provides an easy way to manage a huge and laborious manufacturing process. This helps in better analysis, reduced time in locating parts and products and production process based sensors can be installed to alert any anomalies.

8. EXAMPLES OF RFID TECHNOLOGY AND CORPORATE CULTURE

The features of RFID are manifold and have attributed to the corporate culture. A few of them has been described below:

1. **Production Tracking:** Manufacturers can reduce their working capital needs between 2% and 8% by taking advantage of RFID. By applying RFID tags to subassemblies in the production process, manufacturers can gain accurate, real-time visibility into work-in-process. Industrial control and material handling systems can integrate with RFID readers to identify materials moving down a production line and automatically route the items to the appropriate assembly.
2. **Asset management:** RFID tags can be automatically read at the dock door as they leave with an outgoing shipment. By matching the reading with specific shipment information in a database, manufacturers could automatically build a record of what specific shipping containers were sent to each customer. This information could be used to document cycle times, improve returns and recoveries and aid in disputes with customers about lost or damaged assets.
3. **Inventory Control:** Readers covering warehouse racks, shelves and other storage locations could automatically record the removal of items and update inventory records. If an item was misplaced or needed urgently to complete an order, fixed-position readers or a worker with a mobile computer and RFID reader could automatically search for the item by reading for its specific ID number. To secure inventory from theft and diversion, readers could be set to sound alarms or send notification if items are placed in unauthorized areas of the facility or removed from storage without prior approval.
4. **Shipping & Receiving:** The same tags used to identify work-in-process or finished goods inventory could also trigger automated shipment tracking applications. Items, cases or pallets with RFID tags could be read as they are assembled into a complete customer order or shipment. Manifest information encoded in an RFID tag could be read by the receiving organization to simplify the receiving process and to satisfy requirements like those for advance shipping notices (ASN). Complete shipment data available in an RFID tag can be read instantly without manual intervention. Incoming shipments can be automatically queried for specific containers.
5. **Returns & Recall Management:** Companies could supplement the basic shipment identification information by writing the specific customer and time of shipment to the tag immediately prior to distribution. In the event of a recall, companies could trace specific shipments to specific customers, which would enable a highly targeted notification and return operation and avoid a costly general recall. For general returns, companies could verify that the customer returning merchandise is actually the customer who received it, which would deter counterfeiting and other forms of return fraud.
6. **Service and Warranty Authorizations:** Upon completion of repairs or service, a record of the activity performed could be encoded on the tag to provide a complete maintenance history that travels with the item.
7. **Regulatory Compliance:** Companies that transport or process hazardous materials, food, pharmaceuticals and other regulated materials could record the time they received and transferred the material on an RFID tag that travels with the material. Updating the tag with real-time handling data creates a chain-of-custody record that could be used to satisfy regulatory reporting requirements.

9. SUPPLY CHAIN MANAGEMENT

Supply Chain refers to the distribution channel of a product, from its sourcing, to its delivery to the end consumer (also known as the value chain). In its fundamental form, a supply chain consists of three phases: procurement of raw materials, processing the materials into intermediate and finished goods, and delivery of the goods to customers. Supply chain management consists of monitoring, controlling, and facilitating supply chains. Supply chain management systems are information technologies that support supply chain management and helps in the following activities:

- Scheduling plant activities while optimizing the combined use of all resources
- Planning material requirements based on current and forecasted demand
- Reallocating materials rapidly from order to another to satisfy due dates
- Letting users manage inventories in real time, taking into consideration demand and the responsiveness of all work centers
- Grouping work orders by characteristics of items ordered, such as color and width of products
- Considering the qualifications of each resource to accomplish its task.

10. SUPPLY CHAIN AUTOMATION

RFID has been and is now being used in a wide variety of industrial applications. More recently, RFID labeling of cases and pallets is making a significant contribution to improved supply chain tracking and visibility for retailers and many of their suppliers. Logistics & Transportation is a major area of implementation for RFID technology. For example, Yard Management, Shipping & Freight and Distribution Centers are some areas where RFID tracking technology is used. Transportation companies around the world value RFID technology due to its impact on the business value and efficiency.

RFID tags contain circuitry that allows recording of information about a product. When attached to a product, it contains an Electronic Product Code (EPC), which provides much more information than the Universal Product Code (UPC). The tag can include the date of manufacturing, the plant in which the product was made, lot number, expiration date, destination, and many other details that help track its movement and sale. The information can be read and also revised by special RFID transceivers (transmitter receiver devices).

11. RFID IN INDIA AN OVERVIEW

RFID is a technology evolved for tracking of objects or people. Whether to regulate the entry of people or record inventories while being ported through different value chain touch points, RFID has effectively resolved many complex issues that people managing the systems face on a daily basis. India is no exception to the rule. Here as well, we have complex systems, volumes of objects moving in these systems and a large population that needs to be tracked for various reasons – simply for time sheet calculations or for security concerns.

RFID in India is driven by RFIDAI – RFID Association of India – a not for profit organization promoting the technology. The association has not been able to make a remarkable push so far for many reasons, mostly market driven. But, it is committed towards making the industry achieve respectable size in India.

Many IT software companies in India have forayed into RFID technology, offering solutions mainly for time and attendance for SMEs. There is also an influx of a fragmented vendor community from China supplying tags and readers in the market. But at the same time, respectable industry names like Siemens, Wipro, Infosys and Honeywell have established a fair base in the market.

12. APPLICATION AREAS

Infrastructure – Energy, Logistics, Roads and Railways: Since the inception of economic liberalization of 1991, the Planning Commission of India has been working on bringing the country's infrastructure at par with global standards so that India can be a viable industrial/manufacturing destination besides raising the living standards of ordinary citizens.

The investments in the core infrastructure sector (energy, roads, railways, etc.) have risen considerably and with the inflow of private investments, the results have magnified. For instance, in the 10th Five-Year Plan (2002-06), the actual investments stood at INR 9,19,225 Crore against the projected INR 8,71,445 Crore, an excess achievement of 5.48%. On another note, during the 11th Five-Year Plan (2007-12), private investments were over 33.5% (Mid Term Assessment), compared to an estimated 30% for 2007-08 and 2008-09.

Infrastructure is also turning smart with the implementation of specialized IT solutions like Automatic Fare Collection (AFC), Intelligent Transportation Systems (ITS) and Intelligent Building Systems (IBS) that have not only improved user experience, but also resulted in higher rates of technology penetration. As a reference, RFID technology was adopted by the Ministry of Road Transport and Highways, Government of India for implementing Electronic Tolling systems for national highways. Similarly, on the energy and power utilities side, a shift is occurring towards smart metering and the concept of a smart grid is being actively debated in groups such as the India Smart Grid Forum, an advisory body formed by the Ministry of Power, Government of India. A consensus is expected to emerge in the near future regarding the most optimal architecture of energy grids in the country. RFID will play a critical role in this arena as well.

Industrial: The industrial growth story of India continues at a steady clip, despite the economy having become more skewed toward services in the last couple of decades. In fact, the services boom has led to a substantial domestic market for manufactured goods. India has emerged as a mass consumption market with consumers displaying increased spending capacity as per capita incomes rise.

The government had provisioned for 2% growth in the industrial output in the 11th Five-Year Plan to 11% of the country's GDP, compared to the 10th Five-Year Plan in which the proportion stood at 9%. The Government of India recently announced a policy initiative to grow manufacturing out of seven specially designated National Investment and Manufacturing Zones (NMIZs). Over the next five years – 2012-13 to 2016-17, Government of India plans to invest Rs. 3,500 Crore every year in the seven NMIZs located in Delhi, Uttar Pradesh, Haryana, Rajasthan, Gujarat, Madhya Pradesh and Maharashtra.

One of the crucial industrial sub-segments is the MSEs (Micro and Small Enterprises). MSEs alone contributed around 8% of the country's GDP and accounted for 45% of the manufacturing output in India during FY2010-11. Government of India has announced several steps to improve the functioning of MSEs and bring in operational efficiencies to cope with rising manufacturing costs and remain attractive in the market by offsetting the economies of scale enjoyed by large manufacturers. One of the key initiatives includes increasing usage of technology in the business / manufacturing

processes of MSEs. The government also offers subsidy / financial assistance for using RFID based bar coding on goods produced by MSEs under the ambit of Marketing Assistance schemes floated by the Ministry of Micro, Small and Medium Enterprises (Min of MSME), Government of India.

Healthcare: On an aggregate India spends roughly a little over 5% of the GDP on healthcare. At the same time, various industry statistics put the Indian pharmaceutical industry amongst the top 5 markets around the world. Healthcare is a major concern and the government as well as private players have realized the need to make available affordable healthcare facilities to people across the country. A recent WHO study suggests that around 70% of Indians spend their entire income on healthcare and purchase of drugs. Even after spending their entire earnings, patients are not cured of their illnesses, as they often end up buying spurious drugs that are channelized through different 'grey market' networks. Ensuring that patients have access to genuine drugs can be effectively achieved through RFID implementation.

Government of India has also launched the very ambitious National Rural Health Mission (NRHM), where the aim is to make available basic healthcare facilities to the remotest of corners of the country. In such large scale public health programmes, supervision is always a challenge. Very rarely, do planners come to know the real implementation on the ground. One idea is to use mobile technology to get feedback and keep a track. Similarly, RFID can be used to ensure the delivery of medicines, healthcare systems, machinery etc. at the point and to the patient for whom it is meant.

Retail: Retail is the second largest employer in India after Agriculture and contributed over 10% to the country's GDP during FY 2009-10 (Source: CRISIL). This sector has the widest established network in India and a retail establishment can be found in the remotest of areas. Many sectors, like Telecommunication services leveraged this network to reach to almost the entire population of the country to sell their services.

The organized retail sector has been actively establishing a footprint in the country over the last few years and has now acquired a launch pad with 'thin' networks already in place in metros, Tier I and some Tier II cities. All major global chains have tied up with Indian partners, even as there are media reports that the Government of India may finally permit these global leaders a majority shareholding in multi-brand retail in the country, albeit under to be specified conditions. Currently, the contribution of organized retail is less than 5% of the total retail market in India; with more players expected to enter and existing retail chains likely to scale to denser networks the share of sales of organized retail stores is expected to go up. The world over, retail business is a heavy user of RFID tags from inventory management to payment systems. With the proportion of organized retail's contribution to the economy expected to increase in the next few years, RFID technology usage is very likely to witness a rise.

Others: There are several other areas where RFID can be applied to bring in efficiencies and reduce the operational costs and complexities. No sector in the economy is asset-less, and assets are always valuable. Businesses need to track and secure their assets as well as use them optimally for the intended purpose. With the rapid rise in global security concerns, India is no exception. Governments, citizens, institutions and businesses in general need to ensure their safety. Some other sectors that can heavily use RFID technologies include Government, Defense, Education, Financial Services etc. to name a few. Seeing these sectors through an Indian perspective, we see an all round growth in adoption of RFID, as the sectors themselves grow and rely more on technological solutions.

Favorable Market Conditions: The India market has gradually reached a stage where a need is being felt in more and more sections of industry that use of RFID technologies is necessary. If some of the user concerns such as cost are addressed adequately, RFID adoption can show a significant increase. Some of the favorable market conditions that have set a different scenario for the RFID technology in India may be summarized as follows:

Technology adoption in India has increased by large and there is upward movement towards applying advanced technology solutions in various industry verticals. Government has always adopted an encouraging tone about the adoption of technology. Large scale infrastructure developments and mega projects that require foolproof security solutions, which is not possible manually. Many IT solutions companies pushing RFID technology to open up new revenue streams. Some business decision makers see good value in RFID technology as it helps them in checking pilferage and theft. India is a huge market by geography apart from the population, managing distribution and logistics for such a wide and diverse network has always been a tall order.

RFID can become a Key Enabler: Buildings, malls and other public infrastructure facilities such as airports and railway stations are adopting technology in architecture and design, so solutions based on access control and monitoring technologies like RFID can be more easily applied.

The Manufacturing sector is growing and increasing its contribution to India's GDP. In the initial years of the 11th Five-Year Plan, the growth rate of manufacturing sector stood at 10.3% compared to 9.3% in the 10th Five-Year Plan. Similarly, Agriculture grew at 3.2% compared to 2% for the same period. As per the National Manufacturing Policy 2011, the Government of India would like to see manufacturing sector jobs increase by 100 million by 2020.

Many investors, in particular, foreign investors influence the infrastructure being used for projects where their investments are being channeled. This is also pushing up the usage rate of technology solutions in projects. Public opinion is strongly in favour of effective and clean governance. Technology based solutions, such as RFID can play a vital role in achieving this goal. This will not only help the government in the implementation and execution of social security schemes efficiently, but also reduce establishment and supervision costs considerably.

13. CHALLENGES

RFID technology adoption in India is expected to remain an uphill task for a few more years. As per Cyber Media Research, the main issues that the RFID faces in India are:

- Limited knowledge about RFID applications among decision makers. RFID is seen as add-on cost; a polish upgrade of the existing processes and not as something that brings in efficiencies in the system.
- Lack of government regulations and standardization. Except for the Toll collection system, the Government has not adopted a standard in any other application areas making it a vendor dominated market and causing problems of integration for end-users.
- Cost is still an issue. Potential business users want to see RFID tag costs affordable to the larger end-user community. Very limited number of population believes in and experiences reliable technology alternatives; hence larger groups remain apprehensive about adoption.

- A lot of ‘What if?’ scenarios. Availability of labour at cheap rates and in large numbers to do mundane and routine jobs of manning, guarding, cleaning, refilling, serving etc. discourages increase in utilization rates of technology solutions. In some cases, large project promoters, particularly in infrastructure, not keen in adopting such technologies unless government offers them incentives or otherwise made mandatory.
- Service delivery levels in India across verticals have not reached international standards where usage of such hi-tech solutions would add value to the overall delivery and customer engagement process.

13. SWOT ANALYSIS

A complete picture of the RFID technology, with all its merits and demerits, can be summarized through a SWOT analysis as described below:

<p>Strengths Advance technology Easy to use High memory capacity Small size</p>	<p>Weakness Lack of industry and application standards High cost per unit and high RFID system integration costs Weak market understanding of the benefits of RFID technology</p>
<p>Opportunities Could replace the bar code End user demand for RFID is increasing Huge market potential in many businesses</p>	<p>Threats Ethical threats concerning privacy life Highly fragmented competitive environment</p>

Future Outlook

Cyber-Media Research believes that with the present market conditions evolving, adoption of RFID technology will grow and reach a significant level by 2015 as a large portion of infrastructure and mega projects are completed. Further, with companies as well as the government adopting a strategy to reduce the role of unskilled/semi-skilled labour in offices and manufacturing plants and create more value enhancing jobs, technology will be predominantly used for replacing the need of physical presence for manning and securing assets – whether people, goods, equipment or other types of products.

14. CONCLUSION

RFID technology, as a corporate culture is evolving as a major transformative technology enabler with many promising business applications. Called “the next generation barcode”, RFID’s non-line-of-sight and unique serialization properties promise significant supply chain potential to provide levels of visibility that barcode cannot. RFIDs have tremendous opportunities for increasing value to a firm by providing increased product visibility, reduce out-of-stock items, trim warehouse costs, eliminate stock errors, reduce theft and shrinkage and allow companies to regularly update their logistics and inventory databases. Apart from retail and supply chain, there are wide spread application of RFID in the military and manufacturing industries such as automotive, aerospace, construction, pharmaceutical and defense. Unfortunately, RFID technology has a number of operational factors which can adversely impact its efficient operation. For instance, organizations must address issues regarding RFID command language, the presence of moisture, inclement weather, radiation, invisible RF interference (i.e., WLANs), attenuation, reflection and refraction of radio waves, the material to which a tag is affixed and to some extent building material content. Continued research needs to be carried before RFID can realize its full implementation at a reduced cost structure.

Both individual and group resistance to implementation of RFID technology are very likely to occur, which cannot be said about the acceptance of cultural change. However, we have suggested some general guidelines to achieve it. It may be insufficient, but it cannot be doubted that, without auditing and trying to forecast the cultural consequences of the organizational behaviour linked to IT/IS implementation, such implementation is very likely to fail, no matter how much money is invested in these systems. The ideas have been put forward, and the road is open; further research will be needed to cast more light upon the way action may be taken upon both the organizational culture and the adoption of RFID technology, so that they may be a source of competitive advantage and everything this entails.

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