



## **RFID Industry Survey: Measuring RFID Use and Performance in the DoD Supply Chain**

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Automatic Identification Technologies, or AIT, are changing the way DoD does business. From passive and active RFID to contact memory buttons and 2D barcodes, AIT is enabling faster and more accurate data capture across the supply chain. RFID in particular has been an industry buzzword ever since DoD joined industry giants, including Wal-Mart, in introducing RFID mandates for their suppliers. Now, some three years later after the first interim rule was passed requiring DoD supplier use of RFID, the initial buzz has cooled and been replaced with lukewarm reviews or, in some cases, downright hostility. Given this atmosphere of mixed appraisals on the success of RFID, the time is right to benchmark exactly how far the technology has come and where it is headed.

In late 2007, XIO Strategies, Inc. (XIO) conducted an AIT-oriented industry survey to determine the prevalence, common uses, and process improvements enabled by AIT in the DoD supply chain arena. The following white paper discusses the RFID-related results of this survey.

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## Overview

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The term Automatic Identification Technology (AIT) refers to a suite of enabling technologies used by the United States Department of Defense (DoD), commercial enterprises, and other organizations to facilitate streamlined data processes through electronic data capture. Some of these technologies, such as barcodes, have been in use for 30 or more years while others, such as passive RFID, are relatively new to the supply chain.

For this study, we defined AIT to include Optical Memory Cards (OMC), Active RFID (aRFID), Passive RFID (pRFID), Item Unique Identification (IUID, sometimes referred to as UID), Smart Cards, and Contact Memory Buttons (CMB). These technologies have been defined by DoD as being either primary or supporting AIT technologies for the DoD supply chain. IUID, pRFID and aRFID were the most often used AIT media in this survey; however, no technology was used by more than half of the respondents.

In line with the targeted audience of the survey, 42% of the respondents were from within the DoD or its direct contractor or supplier organizations, with an additional 29% from Manufacturing or Transportation/Logistics industries. The remaining respondents generally identified themselves as Systems Integrators, Consultants, or Other. As is typical of the DoD arena, over one-half of the respondents were from organizations of greater than 2,500 employees. Additionally, 77% are currently in executive- or management-level positions. These demographics suggest that the data gathered in this survey represent the current status of AIT in the DoD supply chain.

In order to structure the questions and the resulting data from this survey, XIO divided the supply chain into the following distinct nodes or functions: 1) Receiving, 2) Manufacturing/Production, 3) Inventory Management, 4) Shipping/Transportation, 5) Customer Delivery, 6) Retail, and 7) Maintenance/Repair.

This white paper will address the RFID-related results of the AIT industry survey.

## How RFID is Being Used

At the beginning of the survey, respondents were first asked to identify which of the technologies were currently in use in their organizational supply chain. Of the technologies selected\*, the three most common were IUID, Passive RFID, and Active RFID (**See Figure 1**). XIO credits this to the following factors:

- RFID and IUID mandates requiring RFID tags on shipments and IUID Data Matrix barcodes on serially managed assets.
- Dissemination of newer contracts with DFARS clauses requiring pRFID and IUID marking.
- Demographics of the respondents: 42% of the respondents were defense contractors or DoD entities, no doubt reacting to RFID and IUID mandates

It is of note that a significant portion of the respondents (20%) are using no AIT. This suggests continued opportunity for growth within the DoD supply chain and industry.

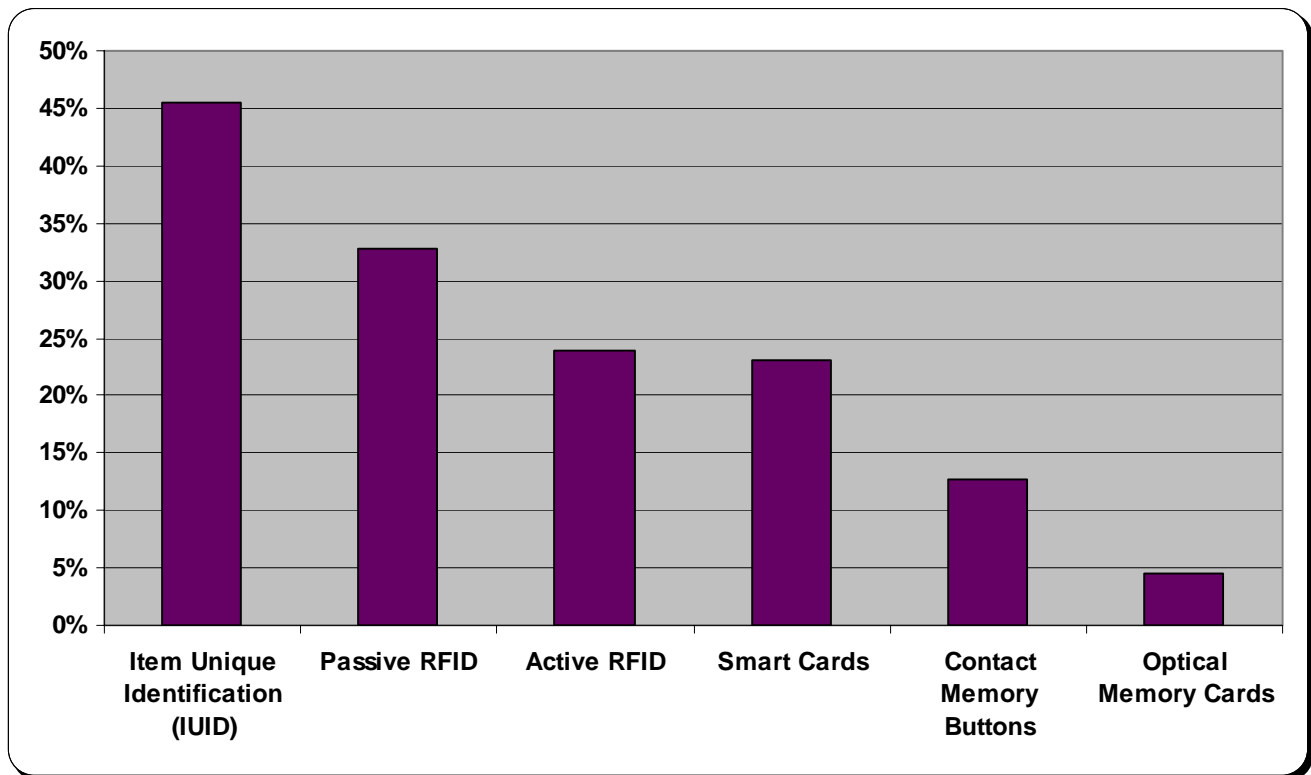


Figure 1: AIT Currently In Use

\* Respondents had the option of selecting more than one technology, so the total percentage exceeds 100%.

We next sought to identify how RFID is being used in the supply chain (*see Figure 2*). Taking a closer look at active and passive RFID, respondents indicated that the predominant use within the supply chain for both technologies is in Shipping and Transportation. This likely reflects the current usage of active and passive RFID by DoD, Wal-Mart, and their suppliers to track assets that are in-transit. However, this also indicates that there is significant room for growth in other applications using RFID within closed supply chains (within warehouses, for example). It also indicates that companies have not yet been able to tap the vast potential of item-level tracking.

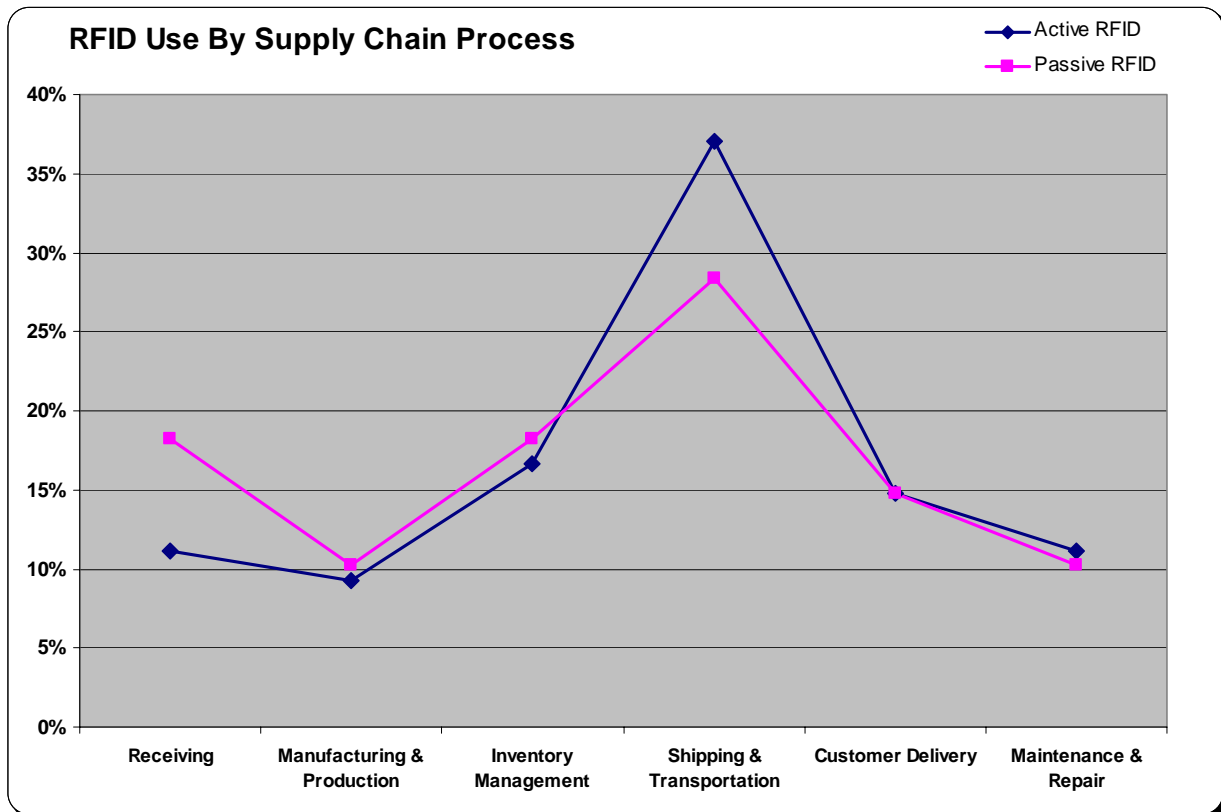


Figure 2: RFID Use by Supply Chain Process

Respondents also indicated that the most prevalent data stored on both active and passive RFID tags is identification data (**See Figure 3**). This is not surprising for passive RFID, which has limited data storage capacity and carries little more than license plate identification data. However, it is interesting to note that aRFID, which generally has much larger data storage capacity, is also being used primarily for identification data. This trend may indicate that organizations are still conducting pilot programs before rolling out more complex uses of aRFID.

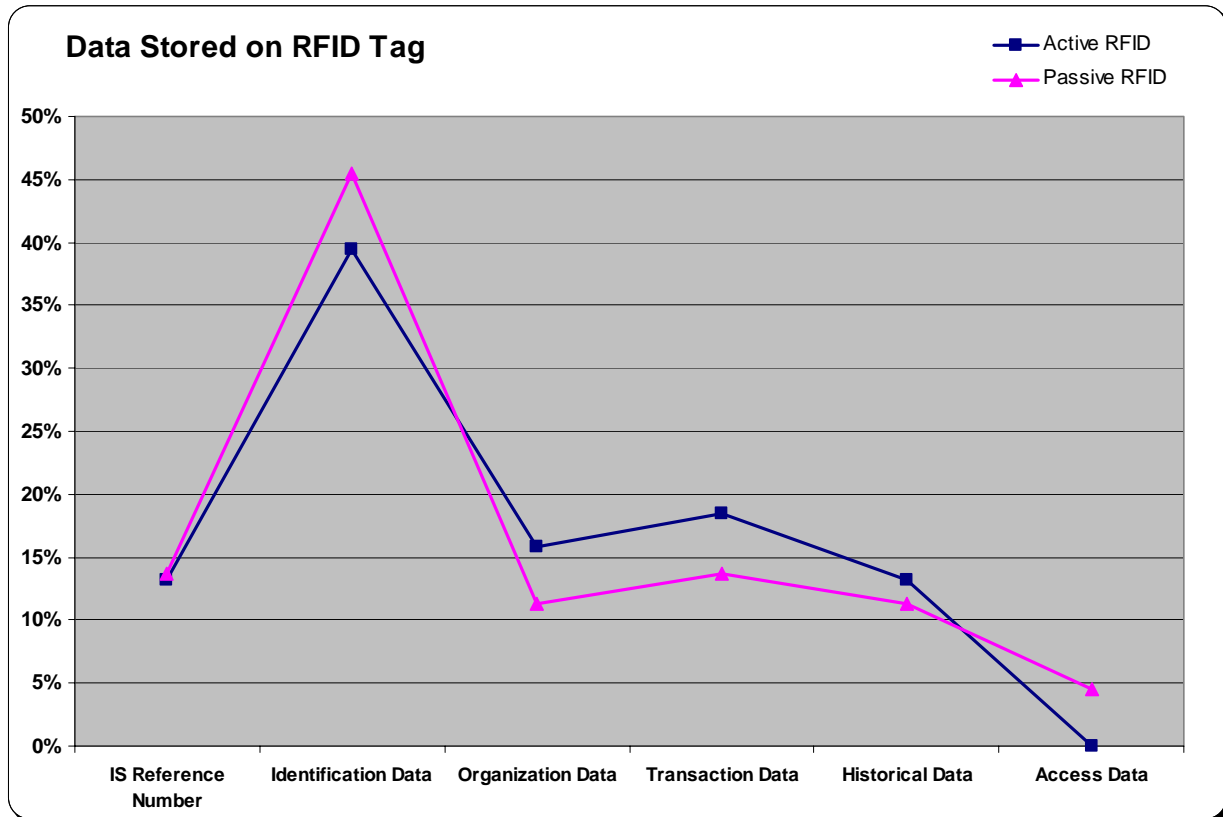
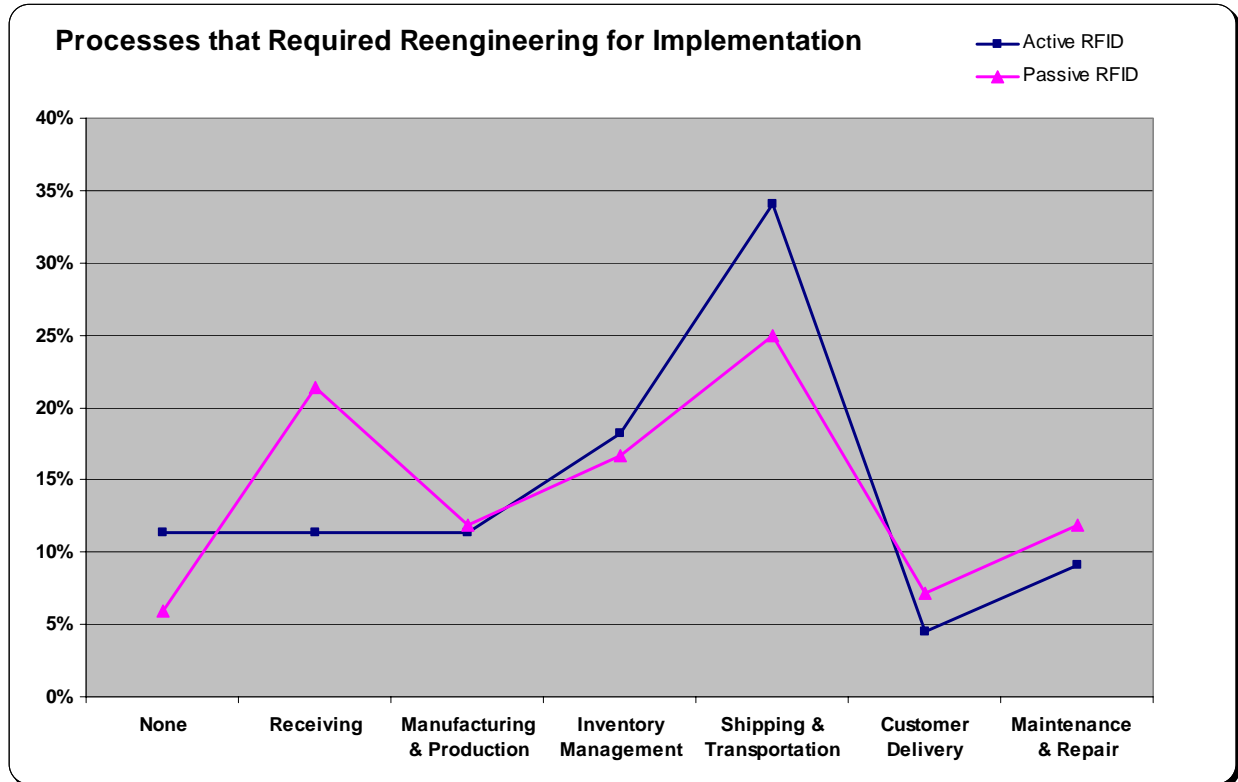


Figure 3: Data Stored on RFID Tag

**Process Improvement**

When asked which processes required reengineering for implementation, respondents once again indicated Shipping and Transportation (*see Figure 4*). While likely just as complex a process as any other in the supply chain, the emphasis on Shipping and Transportation reflects the focus on in-transit visibility that is evident in previous answers. It may also positively indicate that companies choosing to implement RFID are trying to go beyond “slap-and-ship” solutions to reap return on investment and additional business benefits.



**Figure 4: Processes that Required Reengineering for Implementation**

Despite these positive indicators, however, respondents are lukewarm when asked to rank how RFID improved each process. As demonstrated below (**see Table 1**), responses varied from “Great” to “No Improvement”, with the majority of respondents seeing “Some Improvement” in most of the processes. This may indicate that there is more work to be done to reengineer business processes and achieve the greatest ROI possible from the technologies.

<b>Active RFID</b>				
<b>Supply Chain Process</b>	<b>Great improvement</b>	<b>Some improvement</b>	<b>Little improvement</b>	<b>No improvement</b>
Receiving	0%	83%	17%	0%
Manufacturing/ Production	25%	50%	25%	0%
Storage/ Inventory Management	14%	57%	29%	0%
Shipping/ Transportation	22%	44%	22%	11%
Customer Delivery	0%	100%	0%	0%
Maintenance/ Repair	0%	100%	0%	0%

<b>Passive RFID</b>				
<b>Supply Chain Process</b>	<b>Great improvement</b>	<b>Some improvement</b>	<b>Little improvement</b>	<b>No improvement</b>
Receiving	18%	64%	18%	0%
Manufacturing/ Production	38%	38%	13%	13%
Storage/ Inventory Management	23%	54%	15%	8%
Shipping/ Transportation	27%	47%	13%	13%
Customer Delivery	29%	43%	29%	0%
Maintenance/ Repair	50%	38%	13%	0%

**Table 1: Active and Passive RFID Improvements to Processes**

When asked to separate specific ROI from process improvements, the responses were less ambiguous. Somewhat surprisingly, approximately half of the companies did not establish ROI baseline targets. This may be explained by companies implementing RFID only to meet mandates, and not for their own business benefit. The majority of respondents, however, indicated that process improvement objectives were established and were either met or exceeded. The focus on formal process improvement is encouraging, since industry leaders have demonstrated that ROI is generally achieved through business process reengineering efforts that integrate active and/or passive RFID.

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## Summary of Results

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RFID has and will continue to make its mark on targeted areas of the DoD supply chain, particularly those technologies and applications that have been mandated by DoD. However, it is clear that there are areas within the supply chain that have not been widely explored to effectively leverage the potential benefits of RFID, particular areas of the supply chain outside shipping and transportation. We believe these areas present targeted opportunities for organizations to apply the lessons learned from both initial internal efforts and published successes in other organizations to realize further operational benefits. Despite the hype surrounding the conceptual benefits of item level tracking with RFID, these applications also continue to remain elusive. As RFID technology continues to mature and organizations explore the possibilities of improving other supply chain processes, we expect the impacts of RFID will be even more significant.

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## Recommendations

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XIO believes there are several initiatives that can improve the probability of successful RFID deployment, including:

***Leveraging the benefits of lessons learned, both from within the organization and from the outside community.*** The collection of lessons learned is a staple of good project management and key to successful deployment of RFID technology. If your organization is conducting multiple pilot programs, create a cross-project team to discuss any problems encountered or anticipated and share lessons learned. Be sure to research outside your organization as well. While your application may be unique to your company, any problems you encounter most likely will not be. If possible, share your experience. An increasing pool of knowledge and talent can only serve to benefit those deploying RFID in the DoD supply chain.

***Embracing the benefits of a formalized change management program.*** Change Management is a structured approach to address the “human side” of organizational transformation. Anticipate possible resistance to change and mitigate it by involving staff early and often, communicating the benefits, and providing resources for staff with questions. By proactively managing changes in technology, process, or business objectives that affect your staff behavior, you will be better prepared to deploy RFID and will meet with greater success.

***Incorporating a relevant training program into the deployment plan to ensure staff is ready to maximize the benefits from RFID.*** Even with all the portals plugged in, the software installed, and beacons at the ready, your RFID implementation is not complete until your staff has been thoroughly trained. The most advanced RFID technology will fail if it isn’t effectively put to use by the person on the ground. By underestimating the importance of this crucial step, you may undermine your own programs and reduce or negate the ROI from these strategic initiatives.

***About XIO Strategies, Inc:*** XIO Strategies, a McLean Virginia-based woman-owned business, specializes in providing end-to-end supply chain management and change management consulting services to government, military and commercial organizations. XIO works with organizations both large and small to effectively support technology deployment, conduct research and training, create marketing materials, and manage communications programs during periods of change. Through our work in policy planning, process analysis and deployment of the next generation of AIT tools, the XIO team strives to optimize supply chain processes so they are poised to propel our clients forward.