

# 7 Critical Factors for RFID Success



**O A T**

Transforming RFID Data into Value

## 7 Critical Factors for RFID Success

Innovative manufacturers are leveraging the real-time visibility RFID information provides to maximize efficiency and eliminate waste in critical operations such as component sourcing, assembly and delivery. With today's proven, cost-effective solutions, there has never been a better time to deploy RFID technology.

This paper outlines seven critical success factors to determine where RFID delivers the most value to your business, to evaluate and select solutions, and implement and scale projects across multiple facilities and trading partners. These insights are drawn from over 200 RFID deployments across several industries, including industrial manufacturing, transportation, consumer goods and retail.

1

**Deploy Proven Use Cases that Solve Real Problems.** RFID information has been proven to address many of the pressing challenges today's manufacturers face. You can benefit from others' experience and avoid reinventing the wheel.

2

**Adopt a Flexible Deployment Architecture.** One size does not fit all. Organizations of different types and implementations of different sizes require different deployment architectures. Make sure the systems you choose offer the flexibility you need.

3

**Take Advantage of Real-Time Data.** Don't just capture RFID information in a data warehouse. Take full advantage of real-time alerts and insights to reduce error rates and improve productivity.

4

**Integrate RFID Data and Events with Production Systems.** Leverage RFID data where it can add the most value: real-time intelligence for your existing ERP, MES, WMS and MRO systems.

5

**Use a Standards-Based Approach.** Adopting solutions that adhere to EPCglobal standards will ensure that your RFID-based systems can evolve and scale with minimal risk.

6

**Require Broad Device Support from the Beginning.** Regardless of your initial requirements, most organizations find they need a mix of tags and readers from multiple manufacturers. Make sure you have the flexibility to expand your implementation without being locked into a single vendor's products.

7

**Plan for Continuous Improvement.** As you gain experience with RFID, you will find new ways to tune your processes and take advantage of the information it can provide. Make sure your solution can easily adapt as your needs evolve.

# 1. Deploy Proven Use Cases

The combined experience of early RFID implementations has been incorporated into today's packaged RFID solutions. Deploying solutions that include well-defined, proven use cases can greatly reduce the time, cost, and risk of your RFID implementation.

A “use case” in this context is a pre-packaged business scenario that can be configured easily to fit your organization without time-consuming custom programming. These modules handle RFID tagging, data collection and validation for specific business workflows such as:

- Assembling a custom order
- Building a bulk order
- Confirming a shipping manifest

Specifically designed to manage high volumes of RFID data, use cases:

- Append raw RFID data with business logic, resulting in relevant, actionable information
- Configure data exchange parameters with enterprise systems
- Set rules and alerts for exception handling and data integrity
- Manage and monitor devices at the facility and enterprise level

Logic in these predefined use cases has been designed, tested, and proven in production. Because use cases are somewhat granular, a broader application (such as OATSystems' Asset Tracking) might incorporate multiple use cases.

Of course, some work will always be required to configure and adapt the use case to the specifics of your business. You will want to ensure that the modification process is productive, and can be performed using intuitive design tools with point-and-click interfaces rather than extensive custom coding. This way, business processes are under your control, without having to rely on internal or external programming resources.

## ***DID YOU KNOW ...***

*Many users of RFID systems don't take advantage of data when it can offer the most value. They collect and aggregate the information in a data warehouse for later analysis instead of putting real-time RFID data to work.*

*For example, if an order for Birmingham, Alabama, has mistakenly been placed in a shipment bound for Birmingham, England, an RFID system could alert you while the roll cage is still on the loading dock, not after it's arrived at the wrong destination. With RFID, real-time error alerting can be a routine part of your process.*

## **Look For Proven Use Cases That:**

- Have been designed with companies like yours in mind
- Anticipate the specific process steps that will need to take place in your operation
- Have been proven in production deployments
- Incorporate RFID best practices
- Do not require programming to configure, deploy or modify

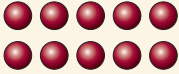
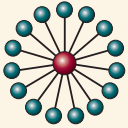



## 2. Adopt a Flexible Deployment Architecture

RFID software mediates between your business applications and the data collection process. Depending on exactly where the software is run, your system might deliver a different level of performance, or involve a different cost structure. You need to tune your software deployment architecture precisely to match your business needs, balancing several considerations including cost, scalability, application responsiveness, and failover capability.

The most flexible architectures enable you to run device management and business logic on servers, controllers, readers, or any combination of these. For example, you might choose to reduce the cost of your infrastructure by deploying business logic directly on readers reducing the number of servers needed to support your application.

Deployment strategies can change as your implementation grows to support more locations and processes:

Organization Type/ Size	RFID-enabled Process	Process Complexity	Real-time Process Control	Implementation Budget	Recommended Implementation
 Small Distributor <10 locations	Asset Tracking	Low	No	Low	- Single server - Readers at each facility - Centralized control
 Large Manufacturer >25 Trading Partners	Shipping & Receiving	High	Yes	Medium	- Single server - One controller per facility - Smart readers in critical areas: loading dock, assembly line, QA
 Fully Automated Manu- facturing Operation Any Size	Work-in-Process  Distribution	High	Yes	Medium-High (funded by reduc- tion in inventory)	Smart readers at every stage of assembly and at loading dock

Even a very large organization will probably start by RFID-enabling a single facility, product line or process, and demonstrating value before deploying more broadly across multiple plants and processes. Flexible deployment architecture can help ensure a streamlined pilot project while enabling the production implementation to scale to any size needed.

### Look For A Flexible Deployment Architecture That:



- Is reasonably priced for small deployments and scalable to multiple processes, product lines and facilities
- Manages data, devices and business rules at the enterprise level
- Can run device management and business logic on servers, controllers or readers to optimize performance while minimizing costs

### 3. Take Advantage of Real-Time Data

One of the most valuable aspects of RFID-enabled processes is the opportunity to take action in real-time based on information about the movement or location of physical assets, equipment or customer orders. With real-time data, you can correct errors before they become costly problems, reducing the time and cost associated with routine verification.

Real-time alerts can be sent directly to a handheld device, web browser or stack light, providing key personnel with immediate notification when:

- A process step is missed
- An order is mis-shipped
- An asset is moved to the wrong facility
- Asset contents are due to expire

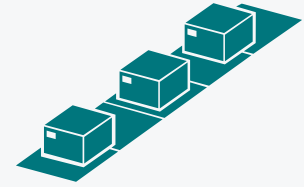
With RFID readers placed at critical distribution checkpoints—at order receipt, on loading docks, in trucks—and a rule-based system that understands the meaning of these locations (the destination of containers at each loading dock, for example), it's a relatively simple matter to identify when an item is in the wrong place and correct the problem. When automated verification and error correction becomes routine, your production team can focus on the exceptions that require their special attention.

#### Look For Real-Time Data Applications That:

- Have configurable rules and alerts to map to your existing processes
- Interface with visual and audible indicators on the factory floor, such as stack lamps and alarms
- Can trigger non-RFID devices such as programmable logic controllers
- Can be easily modified, without programming, as your needs change



#### *RFID-ENABLED WORK-IN-PROCESS*




- Integrates component, process and testing data to create a detailed, auditable history of manufacturing activity
- Provides an accurate and complete record of components and assemblies as they come together in a finished product
- Enables manufacturers to reduce manufacturing errors, asset shrinkage, and labor costs

## 4. Integrate RFID Data with Production Systems

RFID data is a new type of business data—not a new process. When you add valuable information about physical objects, your existing business processes and systems can become smarter about the status of components, units, and shipments, increasing productivity and quality throughout your manufacturing and distribution processes.

Your day-to-day business processes are supported by your existing ERP, MES, WMS, MRO systems and business activity dashboards. With the substantial time and money you have spent analyzing, selecting, and implementing these systems and designing the processes they support, you need to be able to incorporate RFID without costly retooling, or replacing existing systems. RFID should simply add value to, and not radically alter, the systems and processes you have in place.

A common approach is to keep RFID separate from your existing systems, and some companies do just that—handling RFID-based information in a silo with its own data mart. But these companies are missing valuable opportunities.

 <b>Integrating RFID with Production Systems</b>	
<b>ERP</b> Enterprise Resource Planning Systems	<ul style="list-style-type: none"><li>– Verify physical components against bill of materials</li><li>– Trigger inventory replenishment</li></ul>
<b>MES</b> Manufacturing Execution Systems	<ul style="list-style-type: none"><li>– Track physical products at each stage of testing and assembly</li><li>– Confirm custom orders match manifest</li><li>– Locate missing parts &amp; equipment</li></ul>
<b>WMS</b> Warehouse Management Systems	<ul style="list-style-type: none"><li>– Verify manifest and destination for outgoing shipments</li><li>– Prevent mis-shipments with visual/audible alarms</li><li>– Track finished goods inventory</li></ul>
<b>MRO</b> Maintenance and Repair Systems	<ul style="list-style-type: none"><li>– Verify parts &amp; equipment against service order</li><li>– Monitor installation and maintenance history</li><li>– Locate recalled or expired service parts</li></ul>

In the earliest days of RFID, integration was accomplished through time-consuming custom coding. Today, you can take advantage of others' experience as you incorporate RFID into your organization.

### Look For RFID Integration Solutions That:

- Support a Services Oriented Architecture and standards-based information interchange (Web Services, BPEL, APIs...)
- Integrate easily with your current business systems and processes
- Provide two-way data exchange for real-time alerts, as well as historical analysis



## 5. Use a Standards-Based Approach

As RFID technology matures, industry standards are playing a valuable role in the evolution of practical RFID solutions.

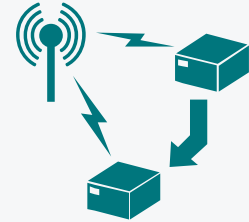
EPCglobal is a vendor-neutral organization leading the development of industry standards for an Electronic Product Code™ to support the use of RFID in world trading networks. While a significant portion of the work undertaken by EPCglobal applies to inter-enterprise RFID standards, this group has also published important architecture standards for data exchange within organizations. Companies wishing to take advantage of RFID technology should look for hardware and software products that adhere to EPC standards for several reasons:

- Standards incorporate best practices for architecting scalable RFID-based solutions.
- When multiple vendors adhere to a vendor-neutral standard, customers benefit from products that can interoperate easily.
- As standards evolve compliant products will keep pace with technological advances
- By using standards for intra-enterprise RFID, companies position themselves for straightforward adoption of inter-enterprise RFID at some future date, to strengthen relationships with trading partners

The most mature standards area is hardware: RFID tags and readers. With the use of standards-compliant hardware, a company can use tags and readers from multiple vendors confidently, and software vendors can more easily support a diverse range of devices. Beyond hardware, though, you should also ask vendors how their software products conform to EPC standards. These standards help ensure that different software components from different vendors will work together, and that a single vendor's solutions adhere to architectural best practices.

Learn more about EPCglobal at [www.epcglobalinc.org](http://www.epcglobalinc.org).

### RFID-ENABLED ASSET TRACKING



- Enables manufacturers to track and instantly locate assets, contents, and component parts across the entire supply and distribution chain
- Automates visual inspection and order verification
- Enables manufacturers to reduce error rates and asset shrinkage, fill orders more efficiently, reduce inventory costs, and improve customer satisfaction

### Look For Standards-based RFID Solutions That:

- Conform to EPC standards for device management, data filtering collection and data capture
- Provide real-time data exchange to EPC Information Services (EPCIS) Accessing Applications
- Interface with 3rd-party EPCIS data repositories



## 6. Require Broad Device Support from the Beginning

Today's manufacturers can choose from many different RFID tag formats and readers, based on the products being manufactured, sourcing and distribution processes, physical conditions, and the lifespan over which the tag must continue to function. The fact that a given reader might be integrated into a manufacturing assembly line, mounted on a loading dock or a moving vehicle, installed outdoors in a parking lot, or embedded in a small handheld device will determine a specific set of functional requirements.

One company might use several different types of tags and readers—even for a single plant. Even if you are starting with a small RFID implementation, you need to be able to choose the best devices for your application, and to know that as your device requirements change, your RFID solution will adapt and grow with you. For this reason it's appropriate to expect that any application you choose will support a broad range of devices from different manufacturers.

### Look For RFID Solutions That Support:



- Multiple tags and readers from different manufacturers
- Active and passive tags
- Non-RFID devices commonly used on the factory floor, such as programmable logic controllers
- Large-scale, dense reader deployments, minimizing cross-reads
- A device management interface for adding, configuring, monitoring, updating, and maintaining devices across multiple processes and facilities

*“Most supply chains are riddled with blind spots. Most (supply chains) don’t react to a problem until it hits the customer—and by then it’s too late.*

*Spotting problems sooner makes them easier to avoid. And leaves you with many more options.”*

– Deloitte & Touche  
USA Manufacturing Practice

## 7. Plan for Continuous Improvement

No manufacturing operation is static. Companies constantly review and revise their processes in response to new products, new customers, new distribution channels, new locations, or technical innovations in the manufacturing process. Because RFID information is part of your business processes, your RFID implementation will need to adjust along with your business. You may need to tag and track new types of items, capture additional information about them, or provide tracking information to trading partners.

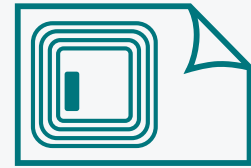
In the early days of RFID, companies had a limited choice: select a stand-alone, packaged application whose hard-coded logic might not meet business requirements exactly, or engage in lengthy and costly custom development. Neither of these approaches offered a productive way to adapt over time. Today, a company adopting RFID can have the best of both worlds, with easily configurable solutions that can be tuned without custom programming and up and running within days, instead of months.

### Look For Configurable RFID Solutions That:

- Provide simple point-and-click interfaces to create and modify RFID-specific business processes – without custom programming
- Include analytics capability to uncover patterns and potential process improvements
- Can manage and customize processes across your organization from a single interface



### INTEGRATED TAGGING



- Incorporates RFID tagging into the manufacturing process with industry-standard label applicators and printers
- Detects errors without human intervention
- Enables manufacturers to increase tagging accuracy and reliability while minimizing cost

## Conclusion:

Innovative manufacturers in Aerospace, Automotive, Electronics, Heavy Equipment and other industries recognize the strategic value of RFID and are expanding early deployments to address a broader range of business objectives. By following the seven critical success factors outlined here, your company will be well-positioned to integrate RFID into its operations, improving efficiency and enhancing profitability.

## About OATSystems

OATSystems has helped more than 100 companies take advantage of Auto-ID to streamline operations, enhance customer satisfaction and increase bottom line results. OAT is the recognized Auto-ID solution leader with software that empowers businesses to achieve both cost savings and competitive advantage. As a pioneer in the development of Auto-ID technology, OAT has been setting the standard in RFID for nearly a decade and has provided real-time enabled solutions to leading companies such as Airbus, Chevron, Best Buy, Tesco, Kimberly-Clark, Cephalon, Shell and others.

Contact OATSystems today at [www.oatsystems.com](http://www.oatsystems.com) or 781-907-6100 and get ready to take control of your operations.

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