Radio Frequency Identification (RFID) is a form of Automatic Identification (Auto-ID) that uses a small wireless device that can be attached to objects or parts. It provides an accurate, automatic and a fast way to record and collect information about the object’s or part’s business activities. For example, you can automatically track the confirmation of deliveries into a warehouse, data can be written and stored onto the device in large quantities if required, and then can be read automatically from a distance with an RFID reader.

In the 1980’s and 1990’s, the use of RFID was often associated with building access control, automatic payments for road charges at toll booths and animal tracking. Today, as a result of massive advances in the technology’s maturity, RFID is recognized as a fundamental enable to streamline business processes, reduce inventory and increase the productivity and quality of business operations. Consequently, companies taking advantage of such capabilities can very quickly develop a competitive edge.
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RADIO FREQUENCY IDENTIFICATION (RFID) - AIRBUS BUSINESS RADAR

The history of RFID in Airbus

Airbus recognized this advantage early on and as part of its mantra for ‘Non Stop Innovation’, started piloting the technology as early as the year 2000, across its tool loans with airlines. By 2006, there were 15 projects across Airbus, each looking at promising new benefits enabled by RFID. However, it was clear that to maximize the benefits across the company, a coordinated approach was needed to avoid duplication of activities and to maximize synergies.

As a consequence, in 2007, a corporate decision was taken to launch a company-wide programme to increase visibility across the lifecycle of the aircraft, using a collection of automatic identification technologies (including RFID). This was called the Value Chain Visibility (VCV) programme. A dedicated transversal team was established to chart a company strategy, develop the optimum use of the technology and consolidate/prioritize activities across the company.

The Value Chain Visibility programme

The VCV programme is an Auto-ID inspired business transformation programme that is developing state-of-the-art streamlined business processes across the value chain through increased visibility and measurability. Its scope is the Airbus value chain, from suppliers to Airbus, between the global Airbus manufacturing sites onto airline customers and in-service partners.

The VCV programme is providing Airbus, its industrial partners and its customers with real-time automated visibility of processes, materials/asset movements and other key business events. By doing so, we move away from an analogue and paper-based value chain to what we call the “Digital Fly-By-Wire” value chain.

Airbus business radar: A digital Fly-By-Wire view of reality
The business radar concept

This may seem like a radical concept at first glance, but the following comparison illustrates the potential benefits of the industrial Fly-By-Wire value chain and Airbus’ business radar concept.

Airports use radar sensors (that use radio frequencies) to automatically track what is going on, in real-time. All the information from the radar sensors feed into the air traffic control system that informs the air traffic controllers what is happening, so they can make the right decisions faster. In other words, they have real-time visibility and measurability.

For airport and air traffic controllers, the benefits are extremely clear. Without that level of visibility, without real-time updates and without this automation, it would be extremely difficult to manage the skies efficiently and prevent incidents, given today’s volume of air traffic.

The same is true for a global industrial company that has tens of thousands moving parts albeit the ground. The more visibility a company has into its operations, the more measurability and control it can have on its processes which in turn, help improve those processes which translate into savings and quality improvements.

Radio Frequency Identification (RFID) helps us adopt the same principle in the same way that radar sensors provide visibility to airports. It is our ‘business radar’ that lets us see what is going on digitally, automatically and in real-time, so we can optimize the way we work and make the right decisions faster.

The Value Chain approach

Airbus does not wish to limit the benefits of this improvement initiative to one specific function (e.g. logistics) or even itself. This is because Airbus considers its value chain to effectively be ‘profits in motion’. These profits are not limited to any particular function but are spread all along it, the same being true for costs. Costs arise from waste that does not distinguish itself between functions, nor limits itself to company boundaries. So Airbus is focusing on the big lifecycle picture in order to make the big savings and develop an approach that maximizes the benefits to all actors across the value chain.

Due to the large scale of this lifecycle based approach, the VCV programme is split into two main categories which are the ‘Non-Flyable’ and ‘Flyable’. The ‘Non-Flyable’ category refers to all the ground-based processes and includes the supply chain, transportation, logistics, manufacturing and assembly related applications. The ‘Flyable’ category refers to all in-service processes and includes operational, maintenance and payload tracking applications.
Within each category, there is a portfolio of new streamlined processes that span the lifecycle of the aircraft. These processes were first piloted in an individual Airbus business location and then once proven, are repeatedly deployed on a large scale across the company. In this way, we re-use and standardize both, the new process and solutions across the company. It is effectively process harmonization with a top down strategy, but executed in a bottom-up fashion.

- Non-Flyable:

  So far, Airbus has deployed almost 20 industrial projects in the ‘Non Flyable’ category that range from warehouse logistics to tooling management, to the work in progress tracking. All these projects, without exception, have shown very strong financial benefits in the order of millions of Euros per year, with pay back periods in most cases of less than one year. The tangible benefits induced by the higher level of automation include a reduction in inventory and capital assets, improved productivity and quality.

- Flyable:

  In March 2006, a two day RFID specific Customer Focus Group was held with 34 airlines and MRO (Maintenance, Repair & Overhaul) organisation participants. Airbus presented its ideas and the attendees provided feedback and their view of priorities. Their inputs have formed the cornerstone of the ‘Flyable’ project.

  The results from an opportunity and pilot analysis across a range of in-service processes with key airlines and MRO partners were found to be better than expected. All the projects had a payback period of less than 12 months with medium to strong savings. But one of the critical enablers for these savings was the high memory UHF (Ultra-High Frequency) passive RFID tags on parts.

As a result of this analysis, Airbus became the first aircraft manufacturer to request its suppliers to add permanent RFID tags to approximately 3,000 parts on each of its new A350 XWB aircraft. These RFID tags are designed to remain with the parts throughout their entire lifecycle, in order to enable process automation and enhance the process visibility for airlines, suppliers and MRO organisations.

For example, consider the line side maintenance domain. When a mechanic replaces a faulty unit with a replacement unit, he will be able to digitally scan the faulty and replacement units in order to complete his work order via a mobile RFID handheld reader. He will also be able to remotely upload this information into his Maintenance Information System (MIS) without the need to fill in any paperwork and later type it into his MIS. As a result, the overall process is much faster, the quality of data in the databases significantly improved and there is less administrative work.
External services

Airbus has been approached by a number of companies, both in aerospace and outside, for support on RFID projects. Part of the added value is clearly to benefit from the first-hand experience of the Airbus team and the proven portfolio of processes and solutions that have already been deployed within Airbus’ industrial environment.

A successful example is the collaboration with Air Portugal’s Maintenance and Engineering (TAP M&E) department in Lisbon, Portugal. TAP M&E and Airbus’ team jointly studied and deployed a RFID solution for tracking parts in an engine repair shop. Work is now ongoing to expand to two additional areas of TAP M&E’s tracking operations (for tooling and life-vests).

The benefits

There are two categories of benefits, short and long term. In the short term, RFID helps us automate processes. Automation:

a) Improves productivity,
b) Makes processes faster which reduces cycle times and inventories,
c) Helps avoid manual errors which therefore improves quality. So overall faster processes, less inventory, less efforts and better quality.

In the long term, RFID can help identify areas where processes can be improved and is therefore an enabler for continuous improvement.

Notes

If you would like further details about what Airbus is doing and how RFID can benefit your company, please contact us. We would be more than happy to invite you to our Value Chain Visibility Industrial Showroom in Toulouse, France, where you can touch and see firsthand how Airbus is using the technology to deliver improvements and savings across its global manufacturing sites.
Other EADS companies

The solid RFID successes within Airbus, together with the spirit of innovation across the EADS group (of which Airbus is one company), has resulted in companies within all the group are also interested in using RFID to enable savings. So, in order to capitalize on the experience and lessons learnt, the different companies within the EADS group are re-using and building on the past of Airbus’ RFID work.

Airbus employee receives the highest award for Radio Frequency Identification (RFID) activities

Carlo K. NIZAM received the distinguished Don Percival award in recognition of his outstanding contribution to the advancement of Automatic Identification (Auto-ID) solutions at the AM conference in November 2010 in Chicago, U.S.A. The award was handed over by the Association for Automatic Identification and Mobility (AIM) which is the international global association for automatic identification and mobility technology. AIM was particularly impressed with Airbus’ wide vision for RFID and how far and fast Airbus had pushed the boundaries for the application of the technology. “To be recognised by your own company is one thing,” Carlo says. “To be recognised by the Auto-ID industry as a whole as best-in-class takes it to another level”.

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Conclusion

Airbus is using RFID as a ‘business radar’ to improve its business processes through better visibility and taking a lifecycle based approach through a single corporate programme, that aims to maximize benefits to all actors across the value chain. As part of this lifecycle based approach, Airbus has developed and deployed a full portfolio of RFID processes and solutions. The new A350 XWB aircraft will embed RFID capabilities from day one on 3000 of its parts and be able to take advantage of the portfolio of processes that have already been developed. Airbus is ready to support its airline customers and industrial partners to benefit from its proven industrial experiences.