History of RFID

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RAIN RFID

It all started decades ago. As radars were developed in the 1930s, military aviation was first to deploy the technology in larger scale during the World War II. Backscattering radios were particularly utilized to identify friendly aircrafts by modulating backscattered radar signal. Putting military technology aside, the first scientific landmark paper "Communication by Means of Reflected Power" was presented a bit later by Harry Stockman in 1948.

In the late 1960s Checkpoint and Sensormatic were founded. Both of these companies went on to develop Electronic Article Surveillance (EAS) systems that basically use passive 1-bit RFID tags. EAS is arguably the first and most widespread commercial use of RFID that still lives strongly today.

In the 1970s Los Alamos Scientific Laboratory, Northwestern University, was applying RFID technology to track nuclear materials. A spin-off company from this Los Alamos laboratory, Identronix, and other persons from the same research team founded Amtech (that later became part of Transcore) that went on to commercialize automated toll payment systems in the 1980s. This was already 915 MHz but the tag carried only a limited amount of information.

At that time another application field of RFID was the tracking of livestock. Originally the technology was used to monitor cows that were on medication, but the usage soon expanded. These applications utilized low frequencies at around 125 kHz that conveniently enabled small tag size. On the commercial side Texas Instruments launched the TIRIS system that is still in use today.

High Frequency technology at 13.56 MHz soon followed and brought greater read range and higher data transfer rates. In Europe Mikron (later a part of Philips, now NXP) launched the legendary MIFARE. Today MIFARE, along with many of its variants, serve as the basis of NFC and payment cards.

In the early 1990s IBM worked on RFID UHF technology and made pilots with Walmart. However, the technology never made it commercial. IBM went on to sell the related patents to Intermec (now part of Honeywell). In late 1990s Auto-ID Center at MIT was established and led by Professors David Brock and Sanjay Sharma. Their grand idea was to store most of the relevant information in a database, not in the tag itself. This greatly simplified the use case of tag to focus on identification alone. Auto-ID center passed its research responsibilities to Auto-ID Labs in 2003, at which time also EPC Global was established.

All these steps paved the way that increased compatibility, performance and reliability of UHF RFID systems. Emerging global standards, such as EPC Class 1 Gen2 in 2004, further encouraged the first major organizations, such as Walmart, Tesco and the US Department of Defense, to issue mandates demanding their suppliers to become RFID compliant on all their shipments. Immaturity of the RFID value chain in the late 2000s, unhealthy venture capital financing and patent disputes lead to a few years of hesitation and delays in the large scale adoption of RFID, but in the 2010s major roll-outs by Macy's, Hudson's Bay Company, Marco Polo and a number of others have turned this technology into a commodity especially in retail and industrial applications.

There is no stopping RFID now. It has already become a part of our everyday life in the form of tickets, labels, access control, and payments. Today we use RFID even without knowing that we use RFID. In 2014 Smartrac, Impinj, Google and Intel joined forces to establish the RAIN alliance to further boost the global adoption of UHF RFID technology. The alliance was announced in April 2014, and by the end of the year roughly 50 companies from 4 continents had joined the alliance.

For more history, download the AIM Paper— "**The history of RFID-Shrouds of Time**"

ABOUT RAIN RFID ALLIANCE

The RAIN RFID Alliance is an organization founded in April 2014 to promote awareness, increase education and support the universal adoption of UHF RFID technology. RAIN members are manufacturers, distributors, resellers and researchers working with the EPC Gen2 UHF RFID specification, incorporated into the ISO/IEC 18000-63 standard.

RAIN RFID is a wireless technology that connects billions of everyday items to the Internet, enabling businesses and consumers to **identify**, **locate**, **authenticate** and **engage** each item. For more information, visit www.RAINRFID.org.

The RAIN RFID Alliance is part of AIM Global, the worldwide authority on automatic identification, data collection and networking in a mobile environment. AIM is dedicated to accelerating the growth and use of Automatic Identification and Mobility technologies and services around the world. For more information, visit www.aimglobal.org.

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If you're interested in having your company become a member of RAIN or have any questions about the RAIN alliance, please send RAIN an e-mail: info@rainrfid.org