

EPC Network Technology

Overview

The EPC Network is an open standards-based system that will make organisations more effective through real and timely visibility of information about items in the supply chain. This new, open global standard combines low-cost RFID technology, existing communications network infrastructure, and the Electronic Product Code (a number for uniquely identifying an item) to create cost-efficient, real-time, accurate information about the location of items, the history of items, and the number of items in the supply-chain. It is based on research conducted through the Auto-ID Centre with the support of more than 100 leading companies.

EPC Network Will Deliver Value

The EPC Network will enable organisations to be more responsive to customer and consumer needs through more efficient, supply chain operations. This will, in turn, drive business value through increased revenue, decreased costs, and increased asset utilisation. There are strong business cases for implementing the EPC Network in the heart of the supply chain of many industries today. For example:

- > **Warehousing and Distribution:** The EPC Network will lower warehousing and distribution costs and expedite deliveries by enabling faster and more accurate shipping and receiving processes and enhancing picking and packing operations.
- > **Health care:** The EPC Network could help eliminate counterfeit drugs by enabling more accurate tracking and tracing capabilities.
- > **Government:** The EPC Network provides a standard to apply across the government sector that will enable broader item identification and better tracking of high-value assets. Particularly in the area of national defence, this means getting necessary material and supplies to the proper location when they are needed most.
- > **Consumer Goods:** The EPC Network will increase product availability in the retail store, reducing out of stocks and better meeting the needs of consumers. The technology enables retailers to locate items in their back-store operations and improve replenishment and inventory management between retailers and manufacturers.



How the EPC Network Works

The EPC Network is comprised of five fundamental elements:

1 Electronic Product Code (EPC)

The Electronic Product Code (EPC) is the next generation of product identification. Like the GTIN (Global Trade Item Number) contained within a bar code, the EPC is divided into numbers that identify the manufacturer, product, version and serial number. But, the EPC uses an extra set of digits to identify unique items. The EPC is the only information stored on the EPC tag. This keeps the cost of the tag down and provides flexibility, since an infinite amount of dynamic data can be associated with the serial number in the database.

2 EPC Tags and Readers

The EPC Network is an RFID-based system that uses radio frequency to communicate between readers and tags. The EPC (a number for uniquely identifying an item) is stored on a special tag. These tags will be applied during the manufacturing process. In turn, using radio waves, the tags will communicate their EPCs to readers which will then pass the information along to a computer or local application system.

3 Object Name Service (ONS)

The vision of an open, global network for tracking goods requires some special network architecture. Since only the EPC is stored on the tag, computers need some way of matching the EPC to information about the associated item. That's the role of the Object Name Service (ONS), an automated networking service similar to the Domain Name Service (DNS) that points computers to sites on the World Wide Web.

4 Physical Markup Language (PML)

The Physical Markup Language (PML) is a new standard language for describing physical objects. When finalised, it will be based on the widely accepted eXtensible Markup Language (XML). Together with the EPC and ONS, PML completes the fundamental components needed to automatically link information with physical products. The EPC identifies the product; the PML describes the product; and the ONS links them together. Standardising these components will provide universal connectivity between objects in the physical world.

5 Middleware (Savant)

Middleware (Savant) is software technology designed to manage and move information in a way that does not overload existing corporate and public networks. Middleware uses a distributed architecture, meaning it runs on different computers distributed through an organisation, rather than from one central computer. Middleware is organised in a hierarchy and act as the nervous system of the new EPC Network, managing the flow of information.



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