

# The Right Environment

RFID is not always better than bar codes. It all depends on the deployment environment.

May 1, 2006—One common question that often arises whenever a discussion of RFID and bar codes occurs is: "What is the advantage of RFID over bar codes?" The usual answer is that unlike bar codes, an RFID tag does not require an unobstructed line of sight, can be read through various materials and possesses other performance characteristics that make it better able to identify objects without human intervention. However, this answer bears further consideration.

First of all, the non-line-of-sight advantage and the ability to read through materials are not universally true. In fact, it is typically the exception in most manufacturing environments, as anyone who has been involved in the installation of RFID on a consumer packaging line knows well.

Second, the wrong question is being asked. The question should not be, "What is the advantage of RFID over bar codes?" but rather, "In which environments is RFID more effective and efficient than bar codes, and vice versa?" The answer is that RFID is more effective and efficient in unstructured and/or uncontrolled environments, while bar codes are better suited for controlled environments.

I define an uncontrolled environment as one where one can not control the orientation of the data carrier and/or RFID reader to optimize system performance. In a controlled or structured environment, on the other hand, one has the ability to control the orientation of the data carrier and/or the reader.

Some examples of uncontrolled environments include airline baggage systems, military operations warehouses and supply chains from the point where a product leaves a manufacturer through a retailer's warehouse.

Most manufacturers operate in structured environments. They have a finite number of package sizes, and product tends to travel on fixed conveyor lines. This is why manufacturers are having difficulty finding a business case for RFID.

There are still plenty of structured environments in the supply chain for which bar codes are more effective and efficient than RFID. The point of sale (POS), where consumers pay for the goods they buy, is a perfect example.

The vision for the Electronic Product Code (EPC) is to have a unique number for every product with Internet-accessible information about that product. That goal can be met with a range of technologies: RFID, bar codes and even key entry. It is going to be a long time, however, before the ability to read RFID tags, or even bar codes, becomes universally feasible. Insisting on RFID at this time as the only data carrier to meet EPC requirements—or U.S. Food and Drug Administration regulations, for that matter—will only impede the achievement of the EPC vision.

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