

RFID: When a Chip the Size of a Pinhead Knows More than You Think

How Radio Frequency Identification is Redefining Processes, People, and Productivity in Organizations

Straight to the point: how many hours does your team waste each week counting inventory, looking for documents, locating equipment, or verifying the movement of materials? If that question makes you uncomfortable, the problem is most likely never your staff, but rather the absence of a technology that is already out there, readily available, and popular at organizations of every size around the world: Radio Frequency Identification (RFID).

The concept is remarkably simple. A tiny electronic tag or transponder attached to a product, garment, document, piece of equipment, or badge. When a reader comes within range, that chip automatically shares its stored information: no physical contact, no line of sight, and no pointing needed. The same principle is already in use at subway turnstiles, automated toll booths, and airport baggage tracking. Yet, –and here’s the punchline–, when integrated into an organization’s day-to-day operations, the impact is rather odd.

To make this more tangible, imagine you need to move a batch of 1,500+ garments from your headquarters to your branch offices. The shipment contains multiple product lines, sizes, colors, each with its own unique identifier. An experienced warehouse operator using a handheld barcode scanner might process 700 to 800 items per hour –and that’s being generous, since wrinkled labels, misplaced items, and manual entry errors are not uncommon. A simple verification of that shipment would easily take two hours of focused work, with a real risk of counting errors. With RFID, that same batch of 1,500 garments passes through a reader portal –believe it or not– in mere three seconds. (Yes, you read that correctly: only three seconds.) The system identifies all items at once, without anyone having to pick up, turn over, or scan each piece individually. Half a day of stock-taking becomes a routine operation, with all data automatically entered into the system without any need for manual re-entry.

This kind of efficiency is by no means limited to the fashion retail industry. As numerous studies on RFID applications have shown, the technology excels at collecting data from moving assets and unstructured processes across a wide range of sectors. In manufacturing plants, vehicles moving along an assembly line pass through RFID readers, indicating at each workstation the task to be performed next. In hospitals, ventilators and infusion pumps can be located in real time; no more frantically looking for that vital equipment. Physical copies of documents in corporate archives are cataloged and virtually impossible to misplace. In transport companies and cold storage facilities, the temperature of perishable cargo is monitored throughout the entire route, with the complete history logged directly on the tag itself. These scenarios share one common trait: information that once depended on

someone manually entering it—which was mostly unaccounted for—is now captured automatically and reliably.

The most surprising impact of that technology, however, is on people. RFID-enabled badges provide secure access to restricted areas without the need for physical keys or access codes. No more badge-sharing among colleagues. Plant managers can verify the distribution of employees to specific areas and shuffle teams as needed even before a shift begins, in such a way as to prioritize individual skills and the operational demands. This is not science fiction. It is already happening in manufacturing facilities where the system automatically allocates workers as they enter the plant. Human resource management becomes proactive rather than reactive.

Underlying it all is one same ambition: automatically replacing repetitive human effort with highly reliable information in real time. Researchers such as Curtin, Kauffman, and Riggins (2007), who examined the adoption and use of RFID technology, are emphatic: as the technical bottlenecks of RFID are solved, organizational gains emerge as the new frontier. Although their study is nearly two decades old, and although RFID itself dates back to World War II, its potential as a strategic business solution remains severely underrealized, leaving organizations with considerable opportunities to strengthen their competitive edge. More recent research by Crooks and Haddud (2025) reinforces this perspective, highlighting RFID's substantial competitive potential, particularly when combined with broader organizational capabilities. Such integration enhances reliability, quality, traceability, visibility, real-time monitoring, operational resilience, and corporate sustainability.

Technology does not replace human judgment. It frees people to apply it where it truly matters. One important caveat, however: implementing RFID without strategic planning simply replaces one problem with another. Integrating RFID with existing enterprise systems—such as ERP platforms, inventory management software, workforce attendance systems—is often the most challenging aspect of deployment, making thorough planning essential before implementation begins, not during it. Privacy considerations are equally critical. Tracking employees or customers requires transparency and full compliance with applicable regulations. Moreover, for highly simplified operations or products with very low unit value, return on investment may take longer to materialize. The smartest approach is to start where inefficiencies are most costly—where time is wasted, errors accumulate, and rework becomes routine.

The final question is simple: Which processes in your organization still depend on someone carrying a handheld scanner, on a manually completed spreadsheet, or simply on someone's ability to remember where they put something? It is precisely in this quiet, everyday friction that a microchip no larger than the head of a pin can begin to change the game.

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References

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Crooks, K., & Haddud, A. (2025). *Using radio frequency identification (RFID) technology in the pharmaceutical supply chain: The impact on competitive advantage*. *Sustainability*, 17(4), 1378.