Sustainable Fashion

How RFID Supports the Transition to a Circular Economy

Ramp – The Value of Visibility

Unlocking the future of sustainable fashion. Discover how RFID technology is revolutionising retail inventory management, driving a circular economy, and making sustainability the new standard.

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Executive Summary

The fashion industry stands at a crossroads, where innovation, sustainability, and responsibility converge. In this white paper, we explore the transformative role of Radio Frequency Identification (RFID) technology in shaping a future where fashion is not just about style but about substance, ethics, and care for our planet.

A New Narrative: Circular Economy

We begin by introducing the concept of a circular economy, a model that challenges the traditional linear approach of take-make-dispose. Through RFID, we envision a world where waste and pollution are designed out, products are kept in use, and nature is regenerated. It's about hope, innovation, and endless possibilities.

Technology as a Catalyst

RFID is more than a tool; it's a key to unlocking a sustainable future. From streamlining processes to reducing waste, enhancing customer experience to driving omnichannel success, RFID is reshaping retail management. It's about creating more profitable, sustainable businesses and shopping experiences that feel effortless and tailored to the individual. Moreover, we delve into the crucial topic of end-of-life textile management, discussing how RFID has the ability to scale the sorting process and make responsible recycling more practical than ever.

Charity Partnership: Thread Together

We look at the collaboration between Ramp and Thread Together, a charity committed to providing quality clothing to those in need. Through RFID, we've transformed inventory management, increased efficiency, and contributed to this amazing charity. It's a testament to what we can achieve when technology and charity combine.

Building a Business Case

Transitioning to a circular economy is not just a sustainable choice; it's a smart business decision. RFID's proven ability to increase sales and reduce stock holdings creates a compelling economic case. It's a win-win situation where businesses can improve their bottom line while contributing to a better world.
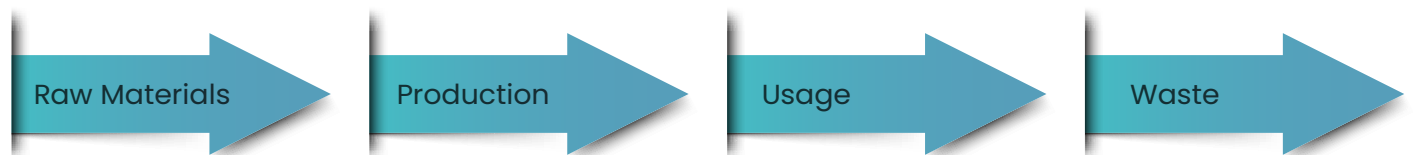
Introduction to Circular Economy

Imagine a world where everything we use, from the clothes we wear to the gadgets we rely on, follows a path that begins and ends with care for our planet. This vision is at the heart of the circular economy (CE), a transformative approach that's reshaping how we think about production, consumption, and sustainability.

A Tale of Two Economies: Circular vs. Linear

In the traditional linear economy, the story is simple but flawed: we take materials from the earth, create products, and then throw them away. It's a one-way street leading to waste and environmental harm.

Linear Economy

Raw Materials → Production → Usage → Waste

The circular economy offers a new narrative. It's a world where waste and pollution are designed out of the system, where products and materials are kept in use, and where nature is regenerated. It's not only about preserving what we have, but also about regenerating and renewing our resources. It's a story of hope and innovation.

(Reduce)

Raw Materials

(Reduce)

Production

Circular Economy

Recycling

(Reduce)

Usage
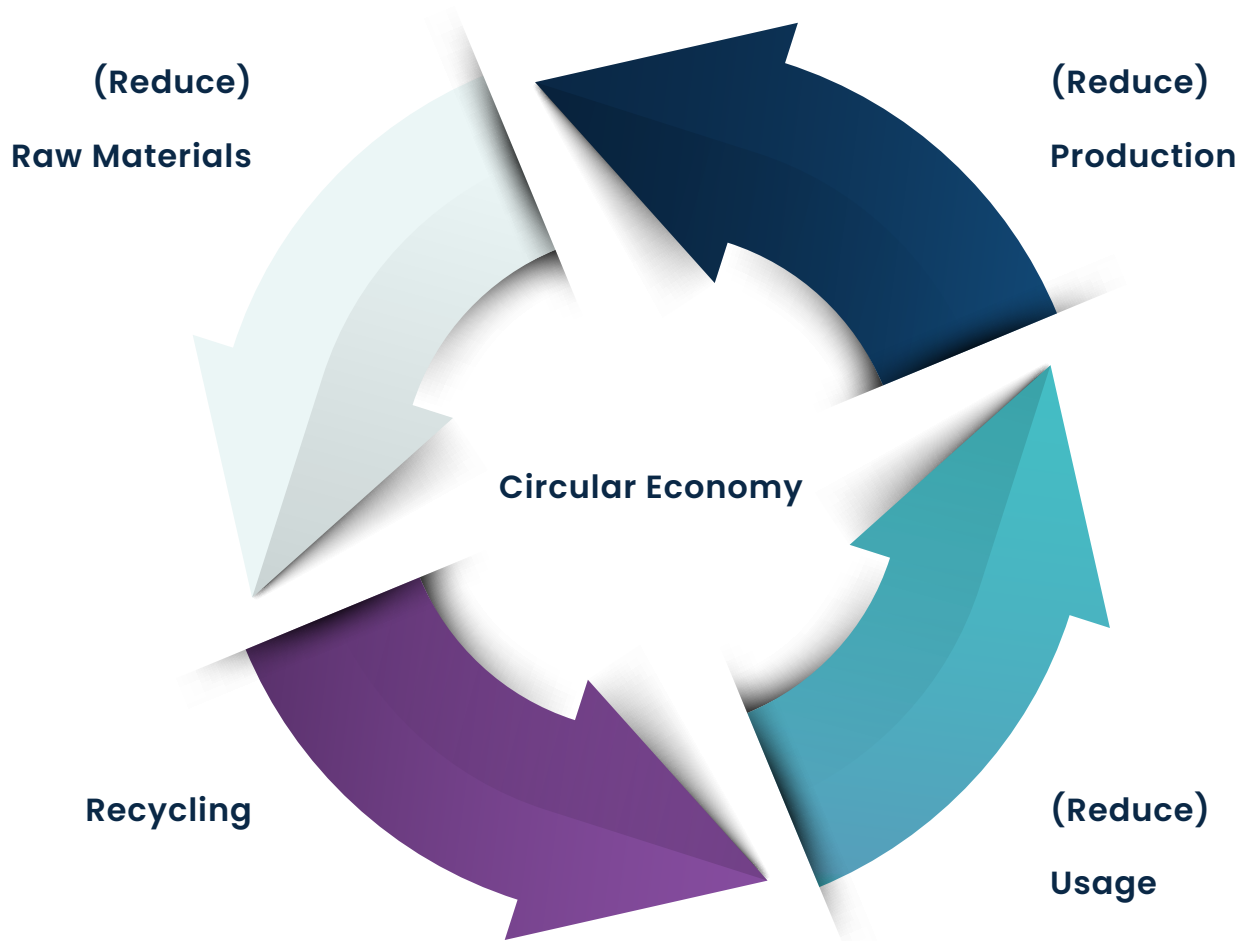
Why the Circular Economy has Become a Priority

The transition towards a circular economy has become a clear priority as the current linear economic system is reaching its physical limits. The urgent need to switch from linear to circular is driven by a mixture of social pressure, government regulations, and the finite resources available on our planet. But there are also economic benefits to a transition to a circular economy. The fashion industry alone could improve the world economy by $192 billion by 2030 if it was able to address the issues preventing it from embracing a circular economy[1]. But there is more to it than money, it's about ethics, stewardship, and the legacy we leave for future generations.

1 Chen, X., Memon, H. A., Wang, Y., Marriam, I., & Tebyetekerwa, M. (2021). Circular Economy and sustainability of the clothing and textile Industry. Materials Circular Economy, 3, 1-9.

Challenges on the Path to Transformation

Like any great shift in process, the journey to a circular economy has its challenges. Economic uncertainty, technological hurdles, and collaboration barriers might seem daunting,[2] but these are not insurmountable obstacles. They are an invitation to innovate, collaborate, and pioneer new ways forward.

The Opportunity to Innovate

The circular economy is not a distant dream; it's an exciting opportunity unfolding right now. Businesses are finding new ways to reduce environmental impacts, create value, and differentiate themselves.[3] Technologies like RFID are unlocking doors to sustainability, enabling us to track, sort, and repurpose materials like never before.[4] It is the digital revolution, including RFID, IoT, Big Data, and Blockchain Technology (BT) that is enabling this transformation.

The circular economy is more than a concept; it's a movement, a philosophy, and a promise of a sustainable future. It's a story we're all part of, and it's a story that's just beginning. As we turn the page, we find ourselves at the forefront of change, ready to embrace a world where everything is connected, where nothing is wasted, and where the potential for innovation and growth is limitless.

2 Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., & Valkokari, P. (2019). Unlocking circular business: A framework of barriers and drivers. Journal of cleaner production, 212, 90-98.
3 Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., & Valkokari, P. (2019). Unlocking circular business: A framework of barriers and drivers. Journal of cleaner production, 212, 90-98.
4 Chen, X., Memon, H. A., Wang, Y., Marriam, I., & Tebyetekerwa, M. (2021). Circular Economy and sustainability of the clothing and textile Industry. Materials Circular Economy, 3, 1-9.

Why Technology is the Key to Success

2% – 13% Reduction in Stock Holdings

In the journey towards a circular economy, technology is our compass, guiding us towards innovation, efficiency, and sustainability. Among the various technologies, RFID (Radio Frequency Identification) stands out as a powerful tool that's reshaping how we approach production, consumption, and environmental stewardship.

What is RFID?

Imagine a world where every product tells its story. Where every item in a store, or warehouse communicates its history, location, and status. This is the world that RFID is creating. By using radio waves to read and capture information stored on a tag attached to an object, RFID streamlines processes, improves accuracy, and enhances efficiency. It's like having a digital fingerprint for every product. Allowing for precise tracking and management like never before.

The RFID Advantage

RFID is not just a technology; it's a catalyst for better decision-making and waste reduction. Research shows that RFID investment leads to increased sales, improved inventory accuracy, reduced stock holdings and lower staff costs. Sales improvements have been measured ranging from 1.5% - 5.5% after RFID implementation, and stock reductions between 2% and 13%.[5]

More sales means more products are being used rather than sitting idle, contributing to a dynamic and sustainable flow of goods. RFID's ability to reduce stock holdings is a step towards reducing unnecessary buffer stock that

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5 Beck, A. (2018). Measuring the Impact of RFID in Retailing: Keys Lessons from. ECR Community Shrinkage and Onshelf Availability Group, Brussels.

could well end up as waste. By having leaner inventory, products are more likely to be sold and used rather than discarded, aligning with the circular economy's goal of keeping items in circulation as long as possible.

The precision of RFID inventory management means fewer products are overproduced or left unsold. This reduction in waste is a vital part of the circular economy, where the aim is to design out waste and pollution.

Complementary Technology

While RFID is a powerful technology, it doesn't work alone. RFID is part of a technological ecosystem that can include QR codes, the Internet of Things (IoT), and Blockchain Technology (BT). For example, combining technologies like RFID and QR codes can be incredibly powerful. RFID allows you track and trace everything in the backend like never before and QR codes are a quick and easy for customers to engage with the products. Technology is more than a tool. It's the key to successfully transitioning to a circular economy. RFID is our partner in the quest for a sustainable future, opening doors to innovation, efficiency, and environmental responsibility.

What can you store in an RFID tag?

The power of the RFID tag is in the ability to serialise every single item. With a unique ID on each item, you can tie all of the items details back to a database. These details could include:

1. **Product Details:** Including product name, model number, and a unique identification number.

2. **Material Composition:** Record the materials used in the product to aid in recycling and reuse.

3. **Manufacturing Date and Location:** Helps in tracking the origin and age of the product.

4. **Assembly Information:** Note how the product is assembled, making disassembly for recycling more efficient.

5. **Maintenance Records:** Keep track of repairs, upgrades, and maintenance history to extend product life.

6. **Usage Instructions:** Share guidelines for optimal usage and care to prolong product lifespan.

7. **Certifications:** Highlight any eco-friendly certifications or sustainable practices.

8. **End-of-Life Instructions:** Provide guidance on proper disposal, recycling centers, or take-back programs.

9. **Lifecycle Data:** Record each phase, from raw materials to disposal, helping to assess environmental impact.

10. **Ownership History:** For products with multiple users, track ownership changes to help reselling or sharing.

11. **Supplier Information:** Maintain data about suppliers for potential partnerships or sourcing materials.

12. **Environmental Impact:** Include data on carbon footprint and energy consumption.

13. **Warranty Information:** Store warranty details to ensure proper maintenance and repairs.

The Value of Visibility for the Circular Economy

In the circular economy, visibility is vital. Knowing where products are, how they are used, what they are made up of, and where they end up is essential for sustainability. RFID helps solve traceability problems in supply chains, collecting data on identified product, and enabling complete information about a product's lifecycle. It's a technology that brings transparency to the forefront, allowing for value recovery through reuse, repair, and remanufacture.

RFID & End-of-Life Items

While the ultimate goal is to keep products in circulation for as long as possible, there comes a time when they reach the end of their life. One of the most significant challenges at this stage is the sorting of textiles. With a myriad of fabrics and blends, determining what can be recycled or needs special treatment is a complex task.

This is where RFID can revolutionise the process. Image a world where each garment comes with an RFID tag sewn into its label, containing all the information needed for its end-of-life management. This tag could specify the type of fabric, its recyclability, and any special treatment it requires.

By integrating RFID tags at the manufacturing stage, we can streamline the sorting process, making it easier to recycle textiles responsibly. This not only contributes to environmental sustainability but also aligns with the principles of a circular economy. It's a simple change with profound implications, turning end-of-life stage from a challenge into an opportunity for responsible resource management.

The scalability of this RFID-enabled sorting process transforms what is currently a labour-intensive, piece-by-piece task into a practical solution for managing textile waste on a large scale.

Groundbreaking Circularity Projects: The Goondiwindi Example

A promising initiative in the realm of sustainable textile management is the Goondiwindi Circularity Project. This Queensland-based project is pioneering ways to return shredded cotton products at the end of their life back to cotton fields. The dual aim? To improve soil health and offer a scalable solution to textile waste. As we mentioned earlier, the aim of the circular economy is to think not only about how to reduce the use of natural resources, but how to regenerate them for the future. The Goondiwindi Circularity Project is a fantastic opportunity to do that.

The Science and Success So Far:

Initial lab tests and field trials have shown encouraging results, including increased microbial activity in soil and successful breakdown of cotton textiles. This project is more than a local initiative, it's a blueprint for how we manage textile waste sustainably on a mass scale.

The Potential for RFID Enhancement:

Think of the impact if each garment in this project had an RFID tag sewn into the label from the start. The sorting process for end-of-life textiles could be automated, making it easier to identify which items can be returned to the soil. This would transform what is currently a labour-intensive process into a scalable solution that contributes to a more sustainable future.

"It's been found that the cotton textile waste has been successfully diverted from landfill — with no harm done to soil health or cotton yields."[6]

6   https://www.sheridan.com.au/goondiwindi-circular-cotton-project.html

Charity Partnership

Thread Together's Mission

In a word where clothing is often seen as disposable, Thread Together stands as a beacon of hope and dignity. Founded on the belief that clothing is a basic human right, Thread Together works tirelessly to deliver new clothes to Australians in need.

From the homeless to individuals recovering from natural disasters, Thread Together restores dignity by providing quality clothing without judgment. By partnering with fashion brands and retailers, they collect unsold clothing that would otherwise go to landfill and distribute it to those who need it most.

But Thread Together's mission goes beyond providing clothing. They protect the environment by keeping clothing in circulation and reducing fashion waste. Recognised by the fashion industry as the most ethical solution to fashion excess, they are a testament to what charity, innovation, and compassion can achieve.
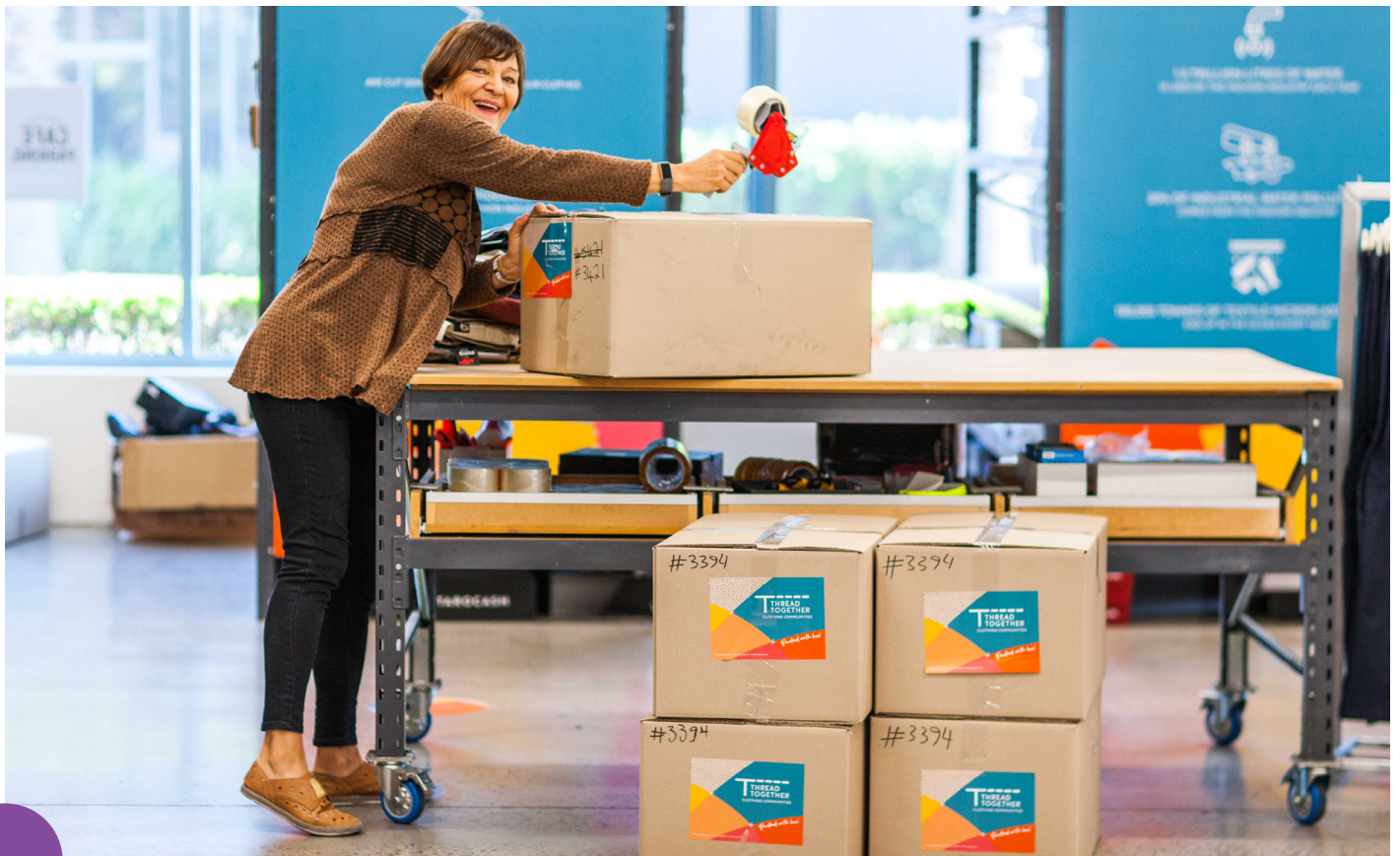
Ramp's Work with Thread Together: Combining Technology & Charity

Ramp's collaboration with Thread Together is a story of innovation meeting compassion. By harnessing RFID technology, Ramp has transformed Thread Together's operations, enabling the charity to tag donated products with ease, providing real-time visibility of stock, sizes, and locations.

This partnership has led to unprecedented improvements in Thread Together's operations:

1. **Improved Environmental Impact:** By streamlining the donation process, more clothing items can be kept out of landfill, contributing to environmental sustainability.
2. **Efficient Inventory Management:** Managing inventory has been transformed into a smooth operation, allowing donated items to be processed and located effortlessly.
3. **Increased Operation Efficiency:** With accurate inventory data, Thread Together can respond promptly to clothing needs, ensuring timely distribution.
4. **Optimised Use of Resources:** The solution minimises time and effort spent on manual stocktaking, freeing up resources for other critical tasks.

The best thing we can do for a circular economy is keep items in circulation in their original form for as long as possible. Recycling is great, but it should be the last resort. Charities like Thread Together are doing amazing work in the community for people in need and Ramp are proud that their RFID solutions are able to contribute to this.

RFID Benefits the Business and the Customer

Improving Customer Experience

In the competitive world today, customer experience is the cornerstone of success. RFID technology is transforming the way businesses interact with customers, creating a seamless and personalised shopping journey. Imagine walking into a store where the staff can instantly locate the exact item you want. Or better yet, getting suggestions from a smart mirror in the changing room, and having someone on the shop floor bring you the items in the right size and colour. RFID makes this and more possible, boosting sales and customer satisfaction.

RFID allows for 25X faster stocktakes, enhancing inventory accuracy and reducing human errors. This leads to significant reductions in inventory holdings, releasing tied-up working capital, and boosting financial agility. RFID isn't just about efficiency; it's about creating more profitable businesses and creating shopping experiences that feel effortless and tailored to the individual.

Omnichannel Success Strategies

In a world where consumers demand convenience and flexibility, RFID is the key to unlocking omnichannel success. Strategies like Buy Online, Pick Up in Store (BOPIS) are no longer optional; they're expected.

RFID enables network-wide inventory availability for online sales, significantly boosting omnichannel strategies.

Whether it's click-and-collect or buy online and return instore, RFID ensures that the customer's journey is smooth, efficient, and satisfying. It's about meeting the customer where they are, providing options that fit their lifestyle, and making every interaction a positive one.

A lack of inventory visibility means stores are holding extra stock to avoid disappointing their customers. Because only 20% Australian retailers have fully integrated their online and instore experiences[7], there is a lot of future waste sitting around in stores in the form of buffer stock.

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7   https://insideretail.com.au/wp-content/uploads/2023/07/Re-energising-the-customer-and-employee-experience.pdf

Building a Business Case for a Circular Economy

Transitioning to a circular economy (CE) is not just an ethical choice; it's a smart business decision. RFID's proven ability to increase sales and reduce stock holdings creates a compelling economic case for starting the transition to a more circular economy. By reducing capital outlay and improving staff productivity, RFID helps offset the cost of transition to a more circular economy. It's a win-win situation where businesses can improve their bottom line while contributing to environmental sustainability. RFID, especially when combined with other technologies like QR codes, create value for both the business and the customer, building a future where commerce and conservation go hand in hand.

25X Faster   **98%+ Accuracy**   **Increased Sales**

Conclusion

A Future of Sustainable Fashion with RFID

The journey towards a more sustainable future is not a solitary one. It's a path we walk together, guided by innovation, compassion, and a shared vision of a world where nothing is wasted. RFID technology stands at the forefront of this journey, opening doors to possibilities that extend beyond mere efficiency.

From transforming the customer experience to unlocking omnichannel success, RFID is reshaping the way we think about retail and sustainability. It's a tool that turns inventory management into an environmental statement.

But the story doesn't end there. Through partnerships with charities like Thread Together, RFID is proving that technology can be a force for good, turning the challenge of excess into an opportunity for change. It's a testament to what we can achieve when we combine innovation with ethics, technology with humanity.

The future is not something that simply happens to us; it's something we create. The transition to a circular economy is not just a trend; it's a necessity, a responsibility, and an opportunity. And it's an opportunity that's within reach.

If you're a retailer looking to take the next step in embracing a sustainable future, the time to act is now. RFID technology is not just a solution; it's a partner in building a world where business success aligns with environmental stewardship.

Join us in this exciting journey towards a future where fashion is not just about style but about substance, ethics, and care for our planet. Let's turn the page together and write a new chapter in the story of sustainability.

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