Redefining Product Lifecycle Management in a Circular Economy

Abstract

Increasing demand for products has caused an increase in the demand for resources. However, dwindling natural resources result in high input and conversion costs. Companies can move to a circular economy by implementing the 5R approach (reduce, reuse, repurpose, remanufacture, and recycle). This shift will drive sustained growth, and impact how Product Lifecycle Management (PLM) capabilities are .derusaem dna ,detnemelpmi ,den ed

Philips, has begun to treat lighting as a service, like electricity or the Internet.[1] The company now sells lighting as a service to business customers who only pay for the use of light, while it takes care of the technology risk and investment in hardware.

Such innovation not only requires new strategies but also demands new skills and capabilities.

Emerging Business Models Change the Game

Some leading organizations are adopting and framing strategies to support a circular economy (CE), while others are piloting business models around it.

A circular economy is:

- An alternative to the linear 'take, make, and dispose' model.
- Regenerative, closes loops and keeps products, components, and materials at their highest utility at all times to eliminate waste.
- A framework built on various schools of thought such as Cradle to Cradle, biomimicry, industrial ecology, natural capitalism, and performance economy.

Key Trends of a Circular Economy

Key trends that directly influence the realization of a circular economy include:

- **Promoting the 'product as a service' concept:** Visionary manufacturers are adopting the concept of product as a service (PaaS). This model ensures that the product is used elsewhere if it has not reached end-of-life, and if it has, its parts can be recycled or reused.
- **Encouraging reconditioning and remanufacturing:** Redeployment of products results in additional income. Original Equipment Manufacturers (OEMs) are discovering creative ways of offering reconditioned products at nearly half the price, with the same warranty.
- **Enabling product transformation:** This new approach to design focuses on reuse, remanufacturing, reconditioning, and recycling in an organization.
- **Improving recycling:** Affordable and user-friendly technology is making it easier to extract core materials from products, and ensure better and faster recyclability.
- **Cultivating reuse:** Many products such as books and clothes are discarded before they reach end-of-life. Social media is making it possible for sellers and buyers to connect and trade in a safe and cost-effective manner, exponentially increasing reach.

Conflict minerals such as coltan, cassiterite, gold ore, and wolframite are natural resources obtained from conflict areas and sold to fund combat operations and to create other products.

Making the Case for a Circular Economy

Components and materials flow through various lifecycles until they fulfill their useable life.

Currently, the demand for commodities is growing exponentially and this trajectory is unsustainable over the long term. Natural resources are rapidly depleting due to increased manufacturing needs. The availability of resources needed for different industries is also constantly shrinking. This could soon lead to severe environmental, economic, and social repercussions.

There is also a growing trend of managing conflict minerals through policy decisions and reporting. In essence, increasing scarcity of resources and rising costs are the key drivers of a circular economy.

Challenges to Adopting a Circular Economy

Organizations need lifecycle and real-time product information to plan and design scenarios that enable optimal reduction, reuse, remanufacture, recycle, and repurpose strategies.

However, owing to a CE poses challenges such as:

- insufficient value chain collaborations
- Disconnected internal change management
- Sub-optimal policy conditions
- Shortage of next generation technological support
- Lack of awareness
- Untimely or unavailable systematic information systems

Another significant constraint is the continued unwillingness of governments to use suitable economic and financial instruments to complement the preferred governance and administrative approaches required for implementing a circular economy. Insufficient financial support from banks and inadequate public tax incentives further prevent enterprises from adopting more environmentally-friendly technologies.

As a result, manufacturers find little or no economic incentive in saving tightly controlled resources such as energy, material, and water. Even if these resources become more expensive, they are able to transfer the cost to consumers in the form of higher price markups.

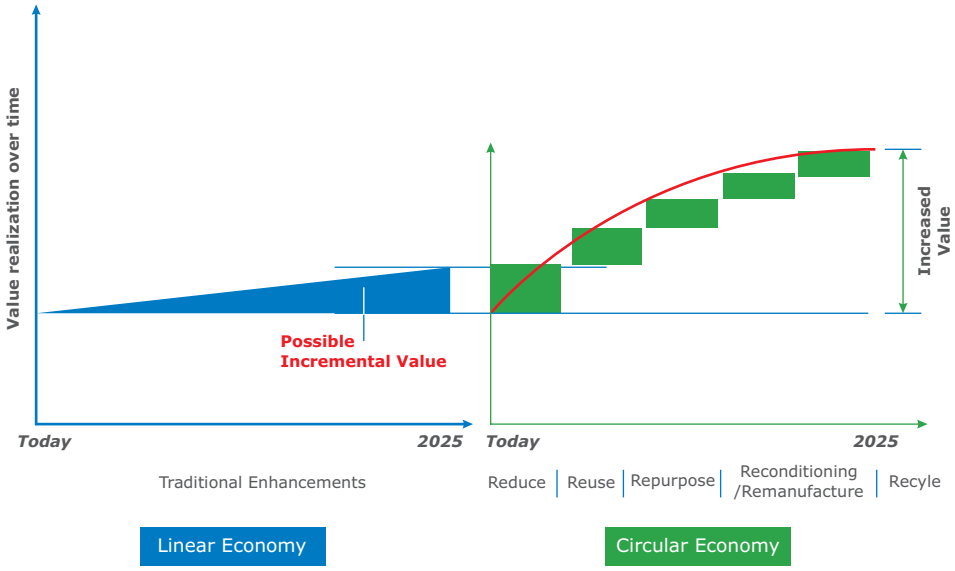
Implementing Circular Economy Principles within an Organization

While companies are aware of the importance of moving to a CE, they fail to act on the assumption that they will not be impacted. To facilitate the move towards a circular economy, businesses must proactively:

- Bring the concept of circular economy into executive dashboards
- Make products circular by design
- Create a fundamental change in mindset
- Harness technology to transform PLM

Three Steps to Implementing a Circular Economy

1. **Embrace social media, gamification, and certification:** Organizations can create awareness about the circular economy and exponentially spread the message.
2. **Prepare to adopt circular economy principles:** Organizations can prepare to adopt circular economy practices by leveraging supporting technology, getting reverse logistics right, and improving information availability for collaboration and decision-making.
3. **Realize the potential of a circular economy:** Organizations need to establish transparent business models that provide incentives to adopt circular economy initiatives.



Value Potential of Products in the Circular Economy Approach

Conclusion

Customers, OEMs, and organizations—all benefit by going circular. Over 100 global companies have already partnered with the Ellen MacArthur Foundation to put circular economy concepts into practice as a business proposition, and not merely as a CSR initiative.2 Companies that rethink PLM to minimize waste can greatly enhance their competitive advantage.

In this age of natural resource scarcity and the rising need for sustainability, organizations can carve out a leadership position in the marketplace by innovating circular economy practices to gain resource efficiency, deliver superior customer value, and revolutionize their operations.

References

[1] Ellen MacArthur Foundation, Towards The Circular Economy - Volume 3, January 2014, accessed on June 1, 2015, http://www.ellenmacarthurfoundation.org/business/reports/ce2014, Page 18

[2] Ellen MacArthur Foundation, Towards The Circular Economy Volume 3, January 2014, accessed on June 1, 2015, http://www.ellenmacarthurfoundation.org/business/reports/ce2014, Pages 6 and 68

About The Authors

Edzil Gonsalves

Edzil Gonsalves is a lead New Product Introduction (NPI) consultant with the manufacturing innovation and transformation group at TCS. He has over 25 years of experience in areas such as product development, supply chain and program management.

Babu K Nagiligari

Babu K Nagiligari is an NPI consultant with the manufacturing innovation and transformation group at TCS. He has over 11 years of experience in manufacturing, supply chain, engineering, and project management.

Vikram Shah

Vikram Shah is an NPI consultant with the manufacturing innovation and transformation group at TCS. He has over 14 years of experience with Fortune 500 companies in automotive and off highway equipment manufacturing.

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Visit TCS' Manufacturing unit page for more information

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