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Towards a Normative Framework for Conducting Business in the Circular Economy

The case of biomimetic enterprises

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Biomimicry, A New Narrative for Sustainability?

In Search of a Normative Framework for Conducting Business in the Circular Economy

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1. Introduction

The Circular Economy (CE) has generated a promise of a sustainable system solution. This promise posits that the CE is restorative and regenerative by design, because it mimics natural cycles in which all resources flow continuously in loops. However, few enterprises have been able to reinvent themselves to take full advantage of the potential of CE. For too many businesses, CE has become synonymous with recycling, which doesn't require a fundamental change in business practice. Without coupling business practice to Earth's planetary boundaries (Rockstrom, 2009), CE remains a metaphor.

It has rarely been conceptually explored how the ideal of CE translates into normative, concrete guidelines for business management. There is little understanding of how circular economy businesses are embedding sustainability impacts and integrate ecological management in their business models to ensure restorative and regenerative outcomes.

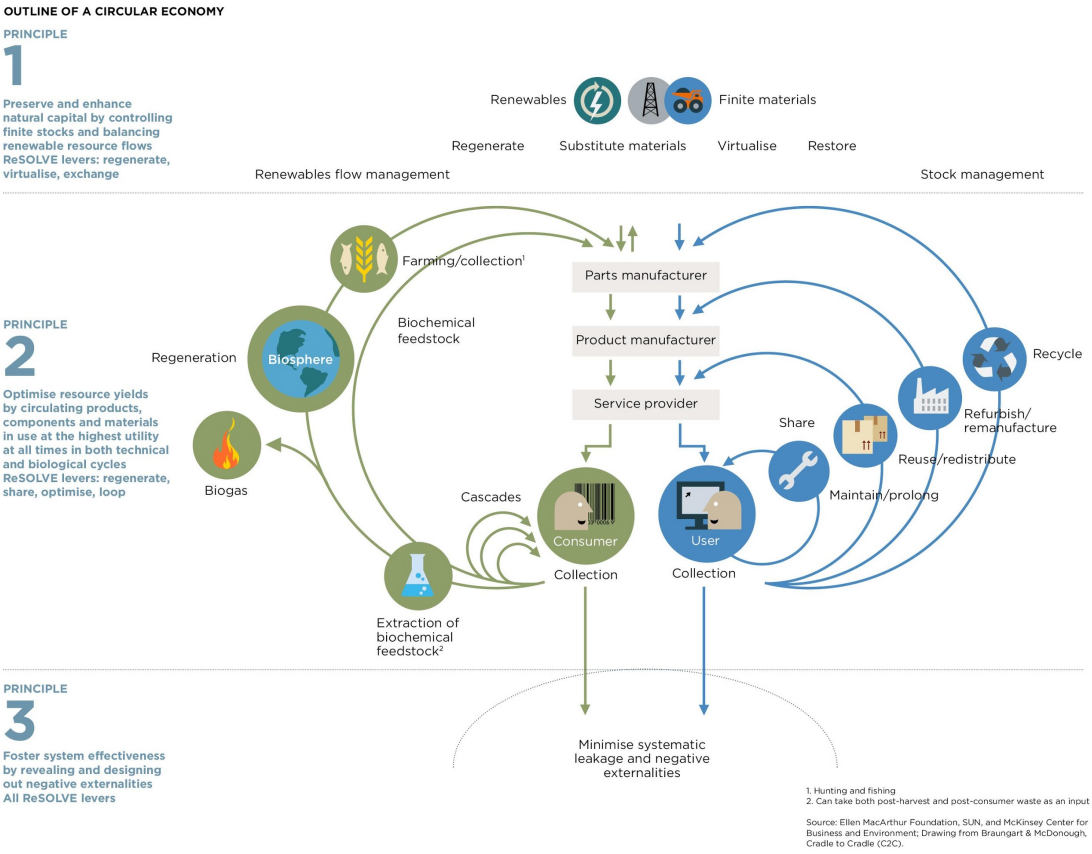
In this paper, we reflect on the question how organisations can operationalise the concept of CE in their business models and engage successfully in ecological management. To this end, we reflect on companies that mimic nature and reinvent themselves around the fundamental science of Biomimicry's Life's Principles in this paper.

2. Problem statement: Key Challenge in implementing Circular Economy in Business

Although there is a lively debate on CE, the actual practice is still marginal, as is the adoption of circular business models (Jonker et al 2017). For a few organisations, CE is their core business, but for most organisations circularity remains a peripheral phenomenon in their business model. Circular business is currently mainly limited to recycling, energy efficiency and raw materials reduction, because closing (material and resource) cycles is considered to be a complex organisational challenge. But if the CE seeks to establish an economy that operates within the carrying capacity of the biophysical system of Planet Earth, it is questionable whether it is sufficient to simply adapt our current business practices?

Recycling can be seen as a first step towards sustainability but does not take 'full advantage' of the potential of the ideal of CE, which is characterised to be regenerative and restorative by design (Ellen MacArthur Foundation, 2015). The ultimate ideal of CE is the

decoupling of environmental pressure from economic growth. This requires a system transition, as scholars in the field of ecological economics argue (Constanza et al 2015). CE transitions based on higher circularity strategies (the inner circles in the 'butterfly diagram' below) call for more radical socio-institutional change throughout the whole product chain than transitions based on lower circularity strategies. "Lower circularity strategies, such as recycling do not trigger profound changes to our cognitive structures (our understanding of how the world works and what is considered normal), and our normative framework (that which is considered legitimate)." (Potting et al, 2017, p6). This raises all kind of fundamental questions regarding the nature of 'C' in the CE and its implications for ecological management in business life.



The Butterfly Diagram (Source: Ellen MacArthur Foundation)

What does 'circularity' actually mean, in the context of regenerative and restorative design, for economic actors? Using natural ecosystems as a metaphor for CE will yield other results then developing CE in analogy with natural ecosystems. We can metaphorically use 'running a business like an ecosystem' to extend our bounds of thinking, or see it as normative, providing prescriptive guides for designing a more sustainable world (Ehrenfeld 2004).

Biomimicry has become a source of design inspiration for a new industrial and economic paradigm that seeks to work with the laws of nature to identify solutions to sustainability challenges (Mead 2017, p 113). We suggest biomimicry as departure point for ecological management, as biomimicry views nature not only as a model for sustainable innovation but also as a measure, or standard, for sustainability (Benyus, 1997; Blok et al, 2016). In this article, we reflect on biomimetic principles, which promote operating and performing *as* nature, in order to operationalise CE in business models and ensure regenerative ecological management.

3. Case Study - Biomimicry as strategic framework for conducting business in the CE

As an example, we can think of the case of Interface, a stock market listed carpet tile company from the US. Interface has evolved its business model and its product offering using biomimicry to position itself as a market leader and as a role model for circular business (i2 & TactTiles by Interface, case study 2018).

Traditionally, most carpets are petroleum-based products, and thus not sustainable nor renewable. In 1994 Interface set the goal of becoming the world's first sustainable carpet manufacturer in the world. An Eco Dream Team was formed and a number of biomimetic principles (that govern natural processes) were translated into corporate strategies and goals for sustainability. E.g.: to eliminate all forms of waste in every area of business; to have only benign emissions and eliminate all toxic substances; to operate all facilities with 100% renewable energy and to redesign processes and products to close the technical loop through the use of reclaimed and bio-based materials. Interface also made an explicit goal to create a sustainability culture amongst their stakeholders and to create a new business model that demonstrates and supports the value of sustainability-based commerce.

This changed strategic direction led to huge breakthroughs in resource use, manufacturing processes and organisational culture. In 2020, Interface's factories will worldwide run on 87% renewable energy and raw materials will consist for about 95% from non-fossil sources. It also led to different partnerships. Suppliers who could not meet the new sustainability demands were replaced; often by ones outside their own sector. For instance, old fishing nets are now used as a resource for new carpet tiles. Philippian fishermen, who cannot fish for fish anymore because of overfishing regulation, now fish for abandoned fishing nets and make in income whilst cleaning up the ocean floor.

As mentioned before, for too many businesses, CE just means more recycling, more of what happens already. There is an expected sustainability impact, and no need for real different business practices; the business model only changes when it comes to resource use.

Interface proves it's possible to get business operations to a zero footprint and demonstrates far more is needed than setting up a recycling program. All building blocks in the business model canvas have changed over the last 20 years. Interface's next step in implementing the CE in analogy with nature, is to *functionally and literally* act as a natural ecosystem and make a positive environmental contribution.

Their newest biomimetic innovation is called "Factory as a Forest"; in which the company is attempting to make their factory as ecologically productive as the local ecosystem. They measure the ecosystem services of the original local ecosystem next door to the factory, get the metrics (# CO2 stored, # air cleaned, # biodiversity supported, etc.) and use these ecological performance standards as the benchmark for business operation.

Clearly this case study of ecological management demonstrates changes in Interface's business model in both value creation, value proposition and value capture.

4. Method

In this paper we look conceptually at the implications of the ambitions of CE for companies and their business processes in general, and for their business models in particular. To this end we reflect on (published) cases of organisations that use nature both as a model (for innovation) and as a measure/standard for sustainability to implement circular business practice. How is biomimicry as a strategic framework being adopted by organisations to operationalise the CE? We provide a philosophical reflection on how ecological management can help develop (circular) business models that respect and meet ecological limits and boundaries to ensure restorative and regenerative outcomes.

We bring biomimicry and CE literature in dialogue with business model (innovation) theories to inform ecological management at the individual organisation level. We reflect on how (biomimetic) organisations use ecological perspectives such as the planetary boundaries (Rockstrom, 2009) and ecological performance standards as metrics for regenerative business management, in order to create net-positive results. In doing so, we develop a new normative framework for sustainability and for circular business model innovation.

Realigning and integrating planetary boundaries with business models will help business practice to fully employ the potential of the CE – which is to become net-positive - and move beyond recycling and eco efficiency and the metaphor of ecosystems.

Word count: 1395

Literature

Benyus, J. Biomimicry: Innovation Inspired by Nature. HarperCollins. 1997.

Blok, V., Gremmen, B. Ecological Innovation: Biomimicry as a New Way of Thinking and Acting Ecologically. Journal of Agricultural and Environmental Ethics, 2016, 29:203-2017

Constanza, R., Cumberland, J.H., Daly, H., Goodland, R., Norgaard, R.B., Kubiszewski, I., Franco, C. An Introduction to Ecological Economics. Second edition, 2015. CRC Press. Taylor & Francis Group. Boca Raton.

Ehrenfeld, J. (2004) Industrial ecology: a new field or only a metaphor? Journal of Cleaner Production 12(8–10): 825–831.

Geissdoerfer, M., Savaget, P. Bocken, N.M.P., Hultink, E. The Circular Economy – A new sustainability paradigm? Journal of Cleaner Production. Volume 143, 1 February 2017, Pages 757-768.

Ghisellini, P., Cialani, C., Ulgiati, S. A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. Journal of Cleaner Production. Volume 114, 15 February 2016, Pages 11-32.

Harman, J. The Shark's Paintbrush: Biomimicry and How Nature Is Inspiring Innovation. 2013. Nicholas Brealey, London, UK.

i2 & TactTiles, Interface. The commercialization story behind the modular carpet tile that mimics the forest floor to reduce material waste, and more. A Biomimicry Case Study. Published by Synapse by Biomimicry 3.8 Written by Biomimicry Business Intelligence. https://synapse.bio/blog//the-carpet-company-that-mimicked-the-forest-floor

Jonker, J., Stegeman, H., Faber, N.R. en Kothman, I. (2017). Eén zwaluw voorspelt veel goeds; resultaten van het landelijke onderzoek 2016-2017 naar Business Modellen voor de Circulaire Eonomie. Doetinchem: Stichting OCF 2.0

Mead, T., Jeanrenaud, S. The Elephant in the Room: Biomimetics and Sustainability? Bioinspired, Biomimetic and Nanobiomaterials. Volume 6 Issue 2, June 2017, pp. 113-121

Potting, J., Hekkert, M., Worrell, E. Hanemaaijer, A. Circular economy: Measuring innovation in the product chain. © PBL Netherlands Environmental Assessment Agency The Hague, 2017. PBL publication number: 2544

Rockström J, Steffen W, Noone K et al. (2009) A safe operating space for humanity. Nature 461(September): 472–475.

Wubben, E.F.M., Runge, N.A., Blok, V., "From Waste to Profit. An interorganisational perspecive on drivers for biomass valorization", Journal of Chain and Network Science, Vol. 12 (3), 261-272