

## EXPLORING THE SOCIAL DIMENSION OF BUSINESS MODELS FOR CIRCULARITY

**ABSTRACT:** This article explores the implications of differing cognitive frames for developing business models for circularity. We argue that the circular economy might enable a sustainable development approach depending on the how the managerial practices are framed by cognitive models of sustainable business and systems thinking. Differing approaches could enable reflexive or radical-reflexive management practice and an orientation imbued by concern for others. Cognitive frames are associated with vastly different assumptions regarding the extent of separation or embeddedness between social and material worlds. Radical-reflexive approaches and a concern for others are more likely associated with new business models for circularity, while a reflective and separatist approach is more likely associated with traditional efficiency-based and functionalist models for circularity. We suggest that exposure to a functionalist approach may set the foundations for future adoption of a more reflexive worldview.

**KEYWORDS:** circular economy, sustainable development, systems thinking, business models, cognitive frames.

## EXPLORING THE SOCIAL DIMENSION OF BUSINESS MODELS FOR CIRCULARITY

The Circular Economy has been interpreted in a multitude of ways and at varying levels of analysis (Kirchherr et al., 2017). Broad approaches define circularity as a series of restorative and regenerative industrial and biological systems (Hobson, 2016) where the purpose is to redefine economic growth by decoupling it from our dependence on material resources, promoting circular instead of linear flows and maximising resource efficiencies (Ghisellini et al., 2015; Moreau et al., 2017). Business Models for Circularity (BMC) are an operationalisation of the broader approach mostly conceptualised at the organizational level and they have been conceptualized as particular strategies on a continuum from slowing to closing loops (Bocken et al., 2016) or more specific tactics such as circular supply chain, recovery and recycling, product life-extension, sharing platform and product as service (Lacy & Rutqvist, 2015).

The circular economy has been touted as being a tool to operationalise sustainable development (Sauvé et al., 2016), a broad agenda for satisfying current societal needs within the carrying capacity of the biosphere, without compromising future generation needs. Hence it has particular relevance to the Sustainable Development Goal (SDG) 12: Ensure Sustainable Consumption and Production Patterns, one of the 17 SDGs that provide a set of priorities and targets to guide countries in addressing pressing social, environmental and economic challenges. But rather than offering an economic model that can maximize human well-being as well as ecosystem functioning in accordance with SDG principles, the circular economy has been criticized as neglecting the social dimensions of sustainable development such as how BMCs contribute to societal well-being and create positive social impacts (Kolk, 2016). Studies of the circular economy have not addressed ethical issues (Moreau et al., 2017; Murray et al., 2017), nor taken a critical approach to the need for socio-cultural

transformation to achieve equitable and efficient material usage and distribution (Gregson et al., 2015; Hobson, 2016).

Importantly, these critiques highlight that despite acclaim for enabling take up of the sustainable development agenda, especially in regard to the environmental dimension, the circular economy has presented challenges around the interlinking or integration of the various environmental, economic and social priorities (Stafford Smith et al., 2017). Even at the operational BMC level, it has been noted that explicit social objectives have been underexplored, such as how humans make choices about the ‘social desirability’ of certain decisions to adopt BMCs (Sauvé et al., 2016). The social dimension of BMC comes into focus when considering the social dimensions of sustainable development, like the ethical decisions regarding material usage, implications for labour (Moreau et al., 2017) during large scale industrial transformations, and questions of how the circular economy could address intergenerational equity, societal well-being or building human capital.

This absence of the social dimension has been accentuated because circular economy interpretations have been largely influenced by industrial ecological approaches, that focus on technical issues such as optimising material flows in manufacturing systems and the cost efficiencies of addressing resource constraints. A major review drawing on Web of Science (science technology and social science data base) and Scopus for the period 1950-2015, using the keyword ‘circular economy’, revealed environmental science, sustainability science and industrial ecology as overwhelmingly dominant research categories. Indicating the low level of social science research in the area, business, economics and management studies represent as few as 15% of the total publications (Lieder & Rashid, 2016). In China there are claims that the circular economy is a means of promoting a more harmonious society, suggesting positive outcomes for labour and society more broadly (Naustdalslid, 2014) but here too, the

academic literature is overwhelmingly focused on the enviro-economic intersection (Lieder & Rashid, 2016).

Aside from research indicating that implementing the circular economy can prompt the development of innovation-related practices (Park et al., 2010), thus potentially building human capital, there is a dearth of study on both how BMCs contribute to the social dimensions of sustainable development, or how the social dimension inhibits or accelerates adoption of BMCs. A focus on the social dimension can be explored through the lens of human cognition about sustainable development and how this is articulated within decision making as people adopt BMCs. That is, by understanding how the strategies and guiding rationales for BMCs are developed and considering if related decisions are mediated by the socio-cognitive models that frame individual managers understanding of and desire to affect sustainable development and achieve the SDGs. We seek to explore the research question: how do differing cognitive frames orient managers approaches to circularity? We draw on cognitive frames of sustainable development as interpreted within differing business models and specifically regarding how and what form of systems thinking shapes decision making.

## **COGNITIVE FRAMES, SYSTEMS AND CIRCULARITY**

Recent studies have concluded that the circular economy acts as an ‘umbrella concept’ that synthesizes previous schools of thought to provide a new cognitive unit and discursive space to reimagine waste and resource management (Blomsma & Brennan, 2017). A European Union communique that was issued to formulate policies highlighted that, the circular economy .. *implies full systemic change, and innovation not only in technologies, but also in organization, society, finance methods and policies* (EU, 2015). Despite this promise of systemic change and new cognitive approaches, few studies have been concerned with how

people interpret circular economy or form decisions to develop new social practices, such as around labour, stakeholder relations or community interaction, as a result of changes in technical systems or conversely how changes in participative governance might impact on technical resource allocation systems (Moreau et al., 2017). And this is further complicated when considering how circular economy connects with sustainable development as how these concepts have been linked can differ significantly, especially how externalities are considered in production and consumption systems (Sauvé et al., 2016).

For the most part, BMC research, has been focussed at the micro level, often within a narrow macro systems approach to sustainable development or ‘weak sustainability’ (Sauvé et al., 2016) that focuses on the optimising of material flows within the economic system. In essence, BMCs work to optimise resource efficiency and minimise waste within the production and consumption loops where they have influence. Ecological systems are considered as separate but related sources of resource input to be restored or regenerated. Waste may surface in other parts of the economy as there is a lack of holistic consideration of circularity at the macro level. Externalities as social and environmental costs from one BMC may be “dissociated from the production and consumption of the goods” (Sauvé et al., 2016, 55). This approach has limited potential for understanding the entanglement of the social, material and technical flows as they intermingle in the enactment of new ways of organising circular production and consumption systems.

Research investigating interdependencies between human well-being and ecological ecosystems suggested sustainable development is in the interrelationships between social and ecological systems (Dietz, Rosa & York 2009). Dodds, for example, argues that achieving sustainable development requires understanding a wider system dynamic that reflects “the complex relationship between states of the world and states of the mind...the social

construction of preferences, and the way in which cultural norms condition the satisfaction associated with a particular state of the world. These interlinkages...suggest that important aspects of social, economic and ecological systems are co-determined.” (1997, p, 107). Predominantly, the BMC discourse has not sufficiently addressed recognition of the embedded systems approach whereby business, society and nature are viewed as interdependent nested systems (Allen et al., 2019; Marcus et al., 2010). This is beyond a semantic shift but signals a reconceptualization of how people enact sustainable development toward a recognition that human constructed technical systems of production and exchange (such as the economy) must be sustained within the material capacity of Earth Systems (Griggs et al. 2013). This is a transformative ‘strong sustainability’ approach whereby natural resources are valued as being non-substitutable and that any usage within production and consumption systems is ecologically regenerative or restorative (Hobson, 2016). According to Perey et al. (2018), this not only involves a revaluation of waste as a resource, but also an ethical shift in serving an “obligation to nature” associated with an integrated systems perspective. The CE discourse has not sufficiently addressed recognition of the embedded systems approach whereby business, society and nature are viewed as interdependent nested systems (Allen et al., 2019).

Allen et al. (2019) draw on sociomateriality literature (e.g. Orlikowski, 2007) to reveal more embedded ways of understanding human interconnectedness with ecology, or the adoption of an ecocentric worldview. Sociomateriality theory conceptualises how social and material (i.e. environmental, technical, industrial) worlds are entangled or intersect and iteratively shape each other through daily practices and lived experiences of people. According to Leonardi (2013, p. 61), drawing on Latour (e.g. 1987), ‘no phenomena can be adequately described unless scholars abandon artificial distinctions between lines of thought, and direct their attention to the empirical reality that people, ideas, objects, artefacts, nature,

and the like are all joined together in an intricate network of associations that develop momentum over time'. Our cognition of the intersection between worlds can enable people to shift their thinking toward more transformative ways of understanding their relationships between ecology and how we socially construct systems of value, production and consumption. Thereby we can shift away from an anthropocentric, separatist systems worldview, toward a more ecocentric and embedded systems worldview. Allen et al. (2019) claim that such changes in systems cognition require fundamentally differing forms of inquiry, where by the former is reflective as the environment is viewed as an external entity and decisions regarding the use of natural materials, resources and energy can be reflected upon in a cause and effect cognitive framework. The later ecocentric and embedded systems approach is associated with radical-reflexivity whereby people and the environment are enmeshed and entangled, they interact and constitute one another, so that any decisions regarding natural materials, resources and energy are directly valued as intrinsic for human and ecological existence.

There is now wide literature on how cognitive frames can act as filters and cause managers to select certain approaches over others to address workplace challenges around sustainability (Hahn et al., 2014; Van der Byl & Slawinski 2015; Miron-Spektor et al., 2018). These studies represent a 'micro-turn' in sustainability research that focuses on individual's decision making and their cognitive frames as influential in the adoption of sustainability practices beyond business as usual (Gröschl, S, et al., 2019). One way approaches to BMC can be understood is to assess how people make and form decisions, their cognitive frames that differentially orient managerial approaches to sustainable development, and if and how ecological and social systems are enmeshed or separated within the determination of value. Furthermore, if the dominant view of BMCs has been reflective and within a separatist systems approach, how people can move toward adoption of radically-reflexive approaches is

not well understood.

## **DEVELOPING INTEGRATED SYSTEM COGNITIVE FRAMES**

Moving towards an integrated systems approach and conceptualising interdependencies between ecosystems and human production and consumptions systems represents a foundational shift in human cognition. One approach to explore such change brings together developmental models proposed by a number of authors (e.g. Benn et al., 2018; Schaltegger et al., 2012; Van Tulder, et al., 2014; Winn & Angell, 2000), to analyse how managers address socio-economic as well as material or environmental concerns, whereby moving further along the model is dependent upon increased integration between them until the ideal stage is reached where social and material worlds are seen as inextricably linked, interdependent and interconnected. Drawing from these models, Figure 1 presents a possible framework for examining empirical data in order to explore how adoption of differing approaches to BMC can be associated with the linking of social and environmentally sustainable business practices. Essentially, these differing cognitive frames are founded on vastly different assumptions regarding individuals' interactions with and relationship to material, ecological worlds. Key distinctions are made between efficiency, strategic and the ideal sustainable organization stages, seen as a progression from mere compliance, where for example, society is not recognized as an other, or equal part in negotiation process for industrial development, which mostly depends on the government policy and investors.

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Insert Figure 1 about here

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The first cognitive frame is based on a separation thesis, an anthropocentric view where people consider their activities separate from but related to ecological and social systems. These sustainable business models are termed the compliance and efficiency stages

by Benn et al. (2018) and as the defensive level of sustainable business by Schaltegger (2012). Through this frame managers are motivated to ensure their activities are not in breach of legislative and regulatory policies and they are motivated to achieve eco-efficiency measures and to reduce negative impacts on the environment, employees and society more generally, rather than redesigning their business processes so that negative impacts are eliminated. It loosely overlaps with Dyllick and Muff's (2016) 'Business Sustainability 1.0: Refined Shareholder Value Management'. Here BMCs are influenced by industrial ecology approaches with an overarching aim to manage and optimize the use of material resources as a distinctive capability, separated from social resources such as labour, community support and well-being. Managers may adopt a reactionary orientation most likely motivated by business as usual concerns to defend their reputation and seek approval from their stakeholders.

The second approach is termed Strategic proactivity by Benn et al. (2018) and Schaltegger (2012), this approach focusses on taking business opportunities that relate to sustainability outcomes. As Horisch et al. (2014) point out, this approach overlaps with stakeholder management, so circularity is framed as a matter of ensuring effective practice towards stakeholder collaboration so that the use of material resources can be optimized. Companies at this level will consider their impact on society (Dahlsrud, 2006) and will engage with a range of stakeholders in order to reduce the negative impact of their interactions with them, thus framing the management of material and social resources and issues as a more interconnected, strategic issue. It aligns with Dyllick and Muff's (2016) 'Business Sustainability 2.0: Managing for the Triple Bottom Line', where relationships are established across all stakeholders and links to the definition of socially sustainable organizations that they manage human capital through establishing fair and trusting relations with all stakeholder (Dyllick & Hockerts 2002, p132). Manager cognitive approach may be

more oriented toward a willingness toward genuine improvements in social and environmental performance considering their interdependence with material scarcity and their impacts of their activities on Earths Systems.

Finally, the third approach is considered an ‘ideal type’ where managers are applying transformational strategies (Borland et al., 2016; Benn et al., 2018), redesigning their business practices to eliminate negative effects, operating in an open living system economy. Principles of circularity are relevant here because the aim would be to establish perfect closed loop cycles (Borland et al., 2016). Borland et al., argues for the need for managers of these companies to deploy specific dynamic capabilities enabling the firm to redirect its operations. These capabilities include sensing the environment and stakeholders so as to build trust and enable innovation. Benn et al. (2018) argue this level of sustainable business represents integrated approaches to economic, environmental and social sustainability as the firm, as an economic entity, is embedded in both social and natural systems. In other words, circularity is framed as requiring fully integrated social and material practices and concerns. Addressing the need to link micro and macro levels of sustainability concerns at this level, firms take actions that contribute back to the wellbeing of society and to ensure the impacts of business on the natural environment are regenerative, such as through proactive partnerships, collaboration, advocacy and educational initiatives. This model accords with the ‘sustainable organization’ (Stubbs & Cocklin, 2008). Dyllick and Muff’s (2016) ‘Business Sustainability 3.0: Truly Sustainable Business’ framework where strategies for developing BMC are driven by outside-in objectives to enable circularity within biospheric bounds. This final frame embodies a cognitive frame whereby managers are motivated by their concern for others and their activities are driven by desires to solve social and environmental problems (Schaltegger & Burrit, 2018). From this perspective an organization is embedded within society and operates within Earth Systems bounds.

## DIFFERING SYSTEMS THINKING APPROACHES

Further delving into the underlying assumptions of these differing cognitive frames, the various approaches to BMCs can be understood as managers cognitively sharpening their practice within differing systems thinking approaches. Systems theory has long been applied to sustainable development, in recognition that it concerns the co-evolution of human and natural systems (Meadows, 1972; Norgaard, 1994). Systems thinking has been widely accepted as a key capability for progressing sustainability in education and in organizations (Bansal & Song, 2015; Porter, 2008; Molnar & Mulvihill, 2003). The framework developed in this paper provides a means for assessing the approach managers of BMC adopt in relation to systems thinking.

Classifying approaches to systems thinking is another way of comparing how differing cognitive approaches to BMC can progress sustainable development. Sustainability, sustainable development, sustainable business and the circular economy are widely accepted as systems-based concepts, where it has been long recognized that the “whole is more than the sum of parts” (Bertalanfy, 1968, p. 55). Systems thinking has been described by Checkland (1999, p. 48) as ‘consciously organized thinking using systems ideas’. Figure 2 provides a categorization of the different approaches to systems thinking drawing on a modified framework developed by Porter and Cordoba (2009), based on the Burrell and Morgan (1979) functionalist/ interpretative distinction, Checkland’s (1981) soft systems theory and on complexity theory (e.g. Stacey, 1996), as well as on other academic references to critical systems theory (e.g. Flood, 1990; Mele et al., 2010). We acknowledge these are very broadly scoped characteristics defining these approaches and the work of numerous other theorists underpinning these generalities.

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Insert Figure 2 about here

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These different approaches to systems thinking are implicit in Allen et al.'s (2019) attempt at understanding how management practices may adopt differing reflexivities through a sociomateriality lens. Essentially the managers operating within a functionalist perspective are reflective, whereby the environment is understood as an exogenous force, a system outside of human activities, treated objectively. Approaches to BMC will remain within a paradigm of business as usual with additional efficiencies sought by designing and managing practices that optimize material usage. Alternatively, adopting a radical-reflexive perspective, with an ecocentric approach (Allen et al. 2019), means that managers will be sensitised to their embeddedness within ecological systems, able to question their current practices and adapt to live within the balance of ecological and material systems. In this approach the social and material or ecological elements are entangled. so that the environmental and social worlds shape each other: agency is mutual and in a state of becoming as consistent with complex adaptive systems. Therefore, the various cognitive frames and management practices (described in Figure 1) can be further elaborated by understanding how differing conceptualizations of systems thinking frame managers approaches to developing and managing BMCs.

Functionalist systems approaches typify much of the sustainable business academic and consultant literature regarding circular economy. The material world is framed within technical sustainability frameworks, such as on life cycle analysis, based in the assumption that all inputs and processes are knowable and predictable of rational human behaviour. Organizations in the efficiency phases according to Figure 1 would be largely managed

according to the functionalist approach to systems thinking, wherein the environment is seen as ‘an exogenous force’, separated from social systems of production and consumption, with natural materials conceptualised as resources. Management practice would be reflective (Allen, et al., 2019), focussing on ‘a logical analysis of external situations and events’. Existing management framings of the circular economy as the latest technical solution to address SDGs would not be challenged.

In the interpretative approach, much more attention is paid to understanding the multiple viewpoints of different stakeholders, although attaining an agreed upon outcome is still seen as the objective. Social constructions determine boundaries. We suggest this approach would most likely be linked to the strategic and ideal phases, as collaboration and partnerships formed to construct positive dialogues around restoration tend to see much more focus on inquiry and ongoing learning and change for sustainability actions such as circularity. Managers are based in a reflexive ontological approach (Allen et al., 2018, p. 789) where they are co-creators of their situations, positioning ‘the environment as emergent human and material interaction’. Managers are more likely to ask questions about their current business practices as they interact and relate to the material and environmental dynamics within which they create business activity. Managers engaging with circular economy concepts will be reflexively engaging with underlying assumptions regarding availability of material resources and traditional modes of production and consumption, so that a BMC approach fundamentally changes their current practices. Such reflexive practice is conducive to transformative learning that can enable change around circularity, including how it may also address social issues associated with equitable distribution of wealth and access to material resources.

A complex adaptive systems approach prioritises the phenomena of self-organization, emergence and bottom up change to come to the fore (Porter & Derry, 2012). ‘Sustainability thinking’ frames management approaches that are more suited to the ‘multidimensional and nonequilibrium conditions’ of today’s business world (Porter and Derry, p. 35) . In this approach to management practice, the focus is on the development of stable patterns rather than the availability of all information. Managers may see the ‘environment and people as embedded’, prompting ‘*radical reflexivity*’ that disrupts technocentric ways of conceptualising the circular economy. In this state of radical reflexivity, managers’ usual ontological and epistemological assumptions are challenged so that they ‘question and deconstruct’ the separation between BMC and the socio-ecological systems within which they operate. Such perspectives are more likely to enable a shift towards regenerative systems of consumption and production and BMC designed for sufficiency or degrowth aligning with sustainable development. Thus is enabled the fully developed intermingling of social and material within the cognitive framing of circular economy.

## **SYNTHESIZING BMC THROUGH SYSTEMS THINKING**

Since how circularity is framed is evident in managerial practices and reflects different systems thinking approaches, BMCs can be classified accordingly. In Table 1 we provide examples of BMCs that reflect different framings of the relationships between business activities, materials and waste with suggestions of the systems thinking approaches that would frame how the managers engage with stakeholders and Earths Systems. We have drawn these examples of BMC from extant case-based research (e.g. XXXX 2018; XXXX., 2018; XXXX., 2019).

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Table 1 demonstrates how these models can be applied in understanding how various examples of cognitive framing of BMC, sustainable organization practices and systems approaches can inform the entanglement between material and social aspects of sustainable development. The example sustainable business practices are not exhaustive, but rather offer atypical cases and help to signify the differences between the cognitive frames.

## **DISCUSSION**

Our analysis leads us to suggest firstly that how circular economy is conceptualised so that social, economic and environmental dimensions are integrated in pursuit of a holistic approach to sustainable development, depends on how particular cognitive frames orient interpretation of circular economy in relation to sustainable business. For example, through an efficiency frame these different dimensions are treated independently. This separation view has underpinned much of the circular economy literature as adopted from an industrial ecology perspective. Managers adopt a reflective perspective and are motivated to adopt BMCs if there is a cost-benefit advantage. This can be strongly contrasted with the CAS approach whereby the dimensions intermingle, and managers adopt radical reflectivity where they will be developing BMCs that, for example, are inclusive and regenerative, as well as supporting human wellbeing in terms of labour conditions and creative opportunities.

Thus in highlighting the different cognitive frames that managers might apply to make sense of the circular economy and develop differing approaches to BMC, we might see that even if organizations set out initially to address only the resource efficiency applications of circular economy, the fact that this in itself means increased stakeholder interaction and collaboration may mean the organization moves towards a position where social activities/ actions/ purpose become more important as managers move beyond reflective to reflexive to

radical reflexive practices that allow for holistic or embedded approaches to sustainable business where social and material concerns are entangled.

Secondly, we suggest that these diverse cognitive frames reflected in different levels of sustainable business according to Figure 1 are associated with different approaches to systems thinking that can be described as functionalist, interpretative and CAS systems thinking (Porter & Cordoba, 2009). A technical, functionalist systems thinking perspective underpinning the efficiency sensemaking of circularity is likely to not be accompanied by the perceived need to critically interact openly in dialogue with stakeholders with the intent of shifting meaning around what the circular economy means for an integrated approach to sustainable development. That is not to say the managers of these organizations would not see their role in terms of social responsibility but this is communicated in terms of financial priorities, rather than communicating the value of a social initiative such as labour rights or community-based concerns of firm impacts.

Managers may not consciously follow different systems approaches but to move from reflective to reflexivity, the parameters of functionalist systems thinking that underpin the separation of BMC performance from the ecological matters related to material scarcity for instance, must be acknowledged. Even the foundation of a functionalist approach to BMC entails acceptance that material inputs and outputs can be identified and monitored, and the efficient usage optimized to improve business performance. That said, to reach an approach to the circular economy that integrates social and ecological issues into management practice needs to involve all three sets of systems perspectives. Such companies would recycle, remanufacture or reuse as according to circular economy principles but they also actively engage in meaning making internally and externally around awareness raising for sustainable business and its ethical implications, taking a normative rather than instrumental stance in

their position on the circular economy. For example, they would engage in peer to peer interactions and the formation of learning networks.

Hence we suggest that what would distinguish organizations which demonstrate the more holistic approach to sustainability that positions them in the strategic or ideal sustainable business level is a cognitive frame that allows for a radical-reflexivity, and an open systems perspective manifest in willingness to actively and critically engage with a wider range of stakeholders in meaning making around shared responsibility for sustainability outcomes. Interpretative systems thinking can be at play, as managers would need to have the capacity to facilitate a disruption of their traditional linear business model, such as an organization with a remanufacturing arm. Smaller organizations may initiate their businesses around a radical reflexivity and rethinking of the traditional linear approach to business and waste management. With these organizations, renegotiation of meaning would be an ongoing process as they work to redefine their business model in dialogue with stakeholders.

## **FURTHER CONTRIBUTIONS**

This paper also attempts to address a further limitation in circular economy research to date. Along with the need for a new methodological approach to examine impacts on the social dimension, the strong advocacy-based tone of much of the literature on the circular economy has tended to limit critical analysis. Gregson et al. (2015) for example, in referring to the circular economy, commented that ‘the concept is an endlessly recited ideal’ (p. 22) in need of ‘critical interrogation’ (p. 22). These authors make the point that at least in the EU, the circular economy is a moral economy, involving moral judgements about how materials should be used and distributed within the bounds of the biosphere. The material and social are co-constructed and mediated through ethical decisions that are embedded in norms regarding the function of the economy. This work implies the need to examine circular economy approaches

by means of a framework that deals with ethical, moral or socially responsible elements and to explore as we have done, what the circular economy means for the social as well as the material world. Rather than ignoring the social dimension of sustainable development, participating in the circular economy involves managers in juggling competing claims and priorities, and managing the tensions associated with sustainable business is clearly illustrated by the circular economy (Hahn et al., 2014).

## **FUTURE RESEARCH**

Working from the principle that as the impact of the circular economy on sustainable development will be influenced by the actions taken by individual participating organizations, we could take a qualitative, narrative approach to explore manager perspectives on how and why their organization participates adopts the BMC. Adoption of BMC requires individuals reframe their assumptions and beliefs about sound business practices. From a systems perspective they need to make sense of a new way of working that in functionalist terms offers advantages, but adoption of this new approach is not an incremental change to their current business model. The problem they confront is one of sense-making (Weick, 1995) and to understand how they either resist dealing with this problem or interpret how they may adapt their business models to align with a circular economy is best explored through the narratives they constructed to interpret the possibilities the problem presents, to justify their solutions and to reify their 'new' business model.

## REFERENCES

- Allen, S., Cunliffe, A.L. & Easterby-Smith, M. (2019). Understanding Sustainability Through the Lens of Ecocentric Radical-Reflexivity: Implications for Management Education. *Journal of Business Ethics*, 154, 781-795.  
DOI 10.1007/s10551-016-3420-3
- Andersen, M.S. (2007). An Introductory Note on the Environmental Economics of the Circular Economy. *Sustainability Science*, 2(1), 133-140.  
<https://doi.org/10.1007/s11625-006-0013-6>
- Benn, S., Dunphy, D. & Griffiths, A. (2014). *Organizational Change for Corporate Sustainability* 3rd edition, London and New York: Routledge.
- Benn, S., Edwards, M. & Williams, T. (2018). *Organizational Change for Corporate Sustainability* 4th edition, London and New York: Routledge.
- Blomsma, F. & Brennan, G. (2017). The Emergence of Circular Economy: A New Framing Around Prolonging Resource Productivity. *Journal of Industrial Ecology*, 21(3), 603-614. DOI: 10.1111/jiec.12603
- Bocken, N.M.P., de Pauw, I., van der Grinten, B. & Bakker, C. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, 33(5), 308-320. <https://doi.org/10.1080/21681015.2016.1172124>
- Borland, H., Ambrosini, V., Lindgreen, A. & Vanhamme, J. (2016). Building Theory at the Intersection of Ecological Sustainability and Strategic Management. *Journal of Business Ethics*, 135, 293–307. DOI 10.1007/s10551-014-2471-6
- Burrell & Morgan, (1979). *Sociological Paradigms and Organizational Analysis*. London: Gower.
- Checkland, P. (1981). *Systems thinking, Systems practice*, Chicester, John Wiley.

- Dietz, T., Rosa, E.A. & York, R. (2009). Environmentally Efficient Well-Being: Rethinking Sustainability as the Relationship between Human Well-being and Environmental Impacts. *Human Ecology Review*, 16 (1), 114-123.
- Dodds, S. (1997). Towards a 'science of sustainability': Improving the way ecological economics understands human well-being. *Ecological Economics*, 23 (2), 95-111.  
[https://doi.org/10.1016/S0921-8009\(97\)00047-5](https://doi.org/10.1016/S0921-8009(97)00047-5)
- Dyllick, T. & Muff, K. (2016). Clarifying the Meaning of Sustainable Business: Introducing a Typology From Business-as-Usual to True Business Sustainability. *Organization & Environment*, 29(2), 156–174. <https://doi.org/10.1177/1086026615575176>
- Edwards, M., Benn, S., Angus-Leppan, T., & Perey, R. (2019). Enacting sustainable entrepreneurial action for a circular economy. In, Lindgreen, A., Vallaster, C., Maon, F., Yousafzai, S., & Palacios Florencio, B. (Eds) *Sustainable Entrepreneurship: Discovering, Creating and Seizing Opportunities for Blended Value Generation*, Routledge.
- EU (2015). Commission to the European Parliament, *Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions towards a Circular Economy: a Zero Waste Programme for Europe*. Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1415352499863&uri=CELEX:52014DC0398R%2801%29>
- Flood, R. (1990). Liberating Systems Theory: towards critical systems thinking. *Human Relations*, 43(1), 49–75. <https://doi.org/10.1177/001872679004300104>
- Fox, J. (2012). The Economics of Well-Being: Have we found a better gauge of success than GDP?. *Harvard Business Review*. 9 (1-2), 79-83. Available at:  
<https://hbr.org/2012/01/the-economics-of-well-being>

- Ghisellini, P., Cialani, C. & Ulgiati, S. (2015). A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114(7), 11-32. <https://doi.org/10.1016/j.jclepro.2015.09.007>
- Gregson, N., Crang, M., Fuller, S. & Holmes, H. (2015). Interrogating the circular economy: The moral economy of resource recovery in the EU. *Economy and society*, 44(2), 218-243. <https://doi.org/10.1080/03085147.2015.1013353>
- Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström J., Öhman, M.C., Shyamsundar P., .....Noble I. (2013). Policy: Sustainable development goals for people and planet. *Nature* 495 (7441), 305-307. Available at: <https://www.nature.com/articles/495305a>
- Gröschl, S., Gabaldón, P., & Hahn, T. (2019). The co-evolution of leaders' cognitive complexity and corporate sustainability: The case of the CEO of Puma. *Journal of Business Ethics*, 155(3), 741-762. Doi: [10.1007/s10551-017-3508-4](https://doi.org/10.1007/s10551-017-3508-4)
- Hahn, T., Pinkse, J., Preuss, L. & Figge, F. (2014). Cognitive frames in corporate sustainability: managerial sensemaking with paradoxical and business case frames. *Academy of Management Review*, 39 (4), 463-487. <https://doi.org/10.5465/amr.2012.0341>
- Hobson, K. (2016). Closing the loop or squaring the circle? Locating generative spaces for the circular economy. *Progress in Human Geography*, 40(1), 88-104. <https://doi.org/10.1177/0309132514566342>
- Jackson, T. & Marks, N. (1999). Consumption, sustainable welfare and human needs-with reference to UK expenditure patterns between 1954 and 1994. *Ecological Economics*, 28(3), 421-441. [https://doi.org/10.1016/S0921-8009\(98\)00108-6](https://doi.org/10.1016/S0921-8009(98)00108-6)
- Kirchherr, J., Reike, D. and Hekkert, M., (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221-232.
- Kolk, A. (2016). The social responsibility of international business: From ethics and the environment to CSR and sustainable development. *Journal of World*

- Business*, 51(1), 23-34. <https://doi.org/10.1016/j.jwb.2015.08.010>
- Lacy, P., & Rutqvist, J. (2015). Waste to wealth: the circular economy advantage. Springer.
- Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers Through Society*, Harvard University Press.
- Lieder, M & Rashid, A. (2016). Towards Circular Economy implementation: a comprehensive view in context of manufacturing industry. *Journal of Cleaner Production*, 115, 36-51. <https://doi.org/10.1016/j.jclepro.2015.12.042>
- Lombardi, D.R. & Laybourn, P. (2012). Redefining Industrial Symbiosis. *Journal of Industrial Ecology*, 16(1), 28-37. <https://doi.org/10.1111/j.1530-9290.2011.00444.x>
- Marcus, J., Kurucz, E. , Colbert, B.(2010). Conceptions of the Business-Society-Nature Interface: Implications for Management Scholarship. *Business and Society*, 49(3), 402-438. <https://doi.org/10.1177/0007650310368827>
- Mele, C., Pels, J., & Polese, F. (2010). A brief review of systems theories and their managerial applications. *Service Science*, 2(1-2), 126-135.  
[https://doi.org/10.1287/serv.2.1\\_2.126](https://doi.org/10.1287/serv.2.1_2.126)
- Miron-Spektor, E., Ingram, A., Keller, J., Smith, W. K., & Lewis, M. W. (2018). Microfoundations of organizational paradox: The problem is how we think about the problem. *Academy of Management Journal*, 61(1), 26-45.  
<https://doi.org/10.5465/amj.2016.0594>
- Moreau, V., Sahakian, M., Van Griethuysen, P., & Vuille, F. (2017). Coming full circle: why social and institutional dimensions matter for the circular economy. *Journal of Industrial Ecology*, 21(3), 497-506. <https://doi.org/10.1111/jiec.12598>
- Murray, (2017). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context, *Journal of Business Ethics*, 140, 369-380.  
<https://doi.org/10.1007/s10551-015-2693-2>

- Naustdalslid, J. (2014). Circular economy in China – the environmental dimension of the harmonious society. *International Journal of Sustainable Development & World Ecology*, 21(4), 303-313. <https://doi.org/10.1080/13504509.2014.914599>
- Norgaard, R. (1994). The co-evolution of environmental and economic systems and the emergence of unsustainability, in England, R. (Ed.), *Evolutionary Concepts in Contemporary Economics*, University of Michigan Press, Ann Arbor, MI.
- Orlikowski, W. (2007). Sociomaterial practices: exploring technology at work. *Organization Studies*, 28(9), 1435-1448. <https://doi.org/10.1177/0170840607081138>
- Park, J., Sarkis, J. & Wu, Z. (2010). Creating integrated business and environmental value within the context of China's circular economy and ecological modernization, *Journal of Cleaner Production*, 18(15), 1494-501. <https://doi.org/10.1016/j.jclepro.2010.06.001>
- Perey, R., Benn, S., Agarwal, R. & Edwards, M., (2018). The place of waste: Changing business value for the circular economy. *Business Strategy and the Environment*, 27(5), 631-642. <https://doi.org/10.1002/bse.2068>
- Porter, T.B. (2008). Managerial applications of corporate social responsibility and systems thinking for achieving sustainability outcomes. *Systems Research and Behavioral Science*, 25(3), 397-411. Porter, T.B. (2008). Managerial applications of corporate social responsibility and systems thinking for achieving sustainability outcomes. *Systems Research and Behavioral Science*, 25(3), 397-411.
- Porter, T., & Córdoba, J. (2009). Three views of systems theories and their implications for sustainability education. *Journal of Management Education*, 33(3), 323–347. <https://doi.org/10.1177/1052562908323192>
- Porter, T. & Derry, R. (2012), Sustainability and Business in a Complex World. *Business and Society Review*, 117 (1), 33–53. <https://doi.org/10.1111/j.1467-8594.2012.00398.x>

- Perey, R. Benn, S., Agarwal, A. Edwards, M. (2018).-The place of waste: Changing business value for the circular economy. *Business Strategy and the Environment*, 27(5), 631-642. <https://doi.org/10.1002/bse.2068>
- Schaltegger, S., Lüdeke-Freund, F. & Hansen, E. (2012). Business cases for sustainability: the role of business model innovation for corporate sustainability. *International Journal of Innovation and Sustainable Development*, 6(2), 95-119. <https://doi.org/10.1504/IJISD.2012.046944>
- Stacey, R. D. (1996). *Complexity and creativity in organizations*. San Francisco, CA, US: Berrett-Koehler Publishers.
- Stafford-Smith, M., Griggs, D., Gaffney, O., Ullah, F., Reyers, B., Kanie, N., ... & O'Connell, D. (2017). Integration: the key to implementing the Sustainable Development Goals. *Sustainability Science*, 12(6), 911-919. doi: [10.1007/s11625-016-0383-3](https://doi.org/10.1007/s11625-016-0383-3)
- Sauvé, S., Bernard, S. and Sloan, P., (2016). Environmental sciences, sustainable development and circular economy: Alternative concepts for trans-disciplinary research. *Environmental Development*, 17, pp.48-56. <https://doi.org/10.1016/j.envdev.2015.09.002>
- UN (2014). The road to dignity by 2030: Ending poverty, transforming all lives and protecting the planet. *Synthesis report of the Secretary-General on the post 2015 sustainable development agenda* UN General Assembly A/69/700 4 December.
- Stubbs, W. & Cocklin, C. (2008). Conceptualizing a 'sustainability business model'. *Organization & Environment*, 21(2), 103–127.
- Van Tulder, R., Verbeke, A. & Strange, R. (2014). Taking stock of complexity: In search of new pathways to sustainable development. In Rob Van Tulder, Alain Verbeke, Roger Strange (Eds) *International business and sustainable development* Emerald: Bingley, UK, 1-20.
- Voinov, A. & Farley, J. (2007). Reconciling sustainability, systems theory and discounting. *Ecological Economics*, 63(1), 104-113. <https://doi.org/10.1016/j.ecolecon.2006.10.005>

Weick, K. E. (1995). *Sensemaking in Organizations*. Thousand Oaks: Sage

Winn, M.L. & Angell, L. (2000). Towards a process model of corporate greening.

*Organization Studies*, 21(6), 1119-1147. <https://doi.org/10.1177/0170840600216005>

**Figure 1: BMC Cognitive Frames and Sustainable Business Practices**

<b>Sustainable Business Practices: BMC Framing</b>	<b>Typical social actions</b>	<b>Typical environmental actions</b>
Efficiency	<ul style="list-style-type: none"> <li>-Reducing wasted human resources (e.g. high turnover, low commitment, low level teamwork)</li> <li>- Community information programs to reduce negative feedback</li> <li>-Reducing negative cost- related impacts on society</li> </ul>	<ul style="list-style-type: none"> <li>-Reducing negative cost-related impacts on the environment</li> <li>- Recycle, remanufacturing. Several possibilities for waste reuse have been already identified</li> </ul>
Strategic proactivity	<ul style="list-style-type: none"> <li>- Fair and trusting relations with all stakeholders</li> <li>- Attempt at radical transparency</li> <li>- Initiatives designed to motivate employees such as voluntarism and engagement in decision making around CE</li> </ul>	<ul style="list-style-type: none"> <li>-Renewable energy based innovations.</li> <li>- Innovations around sharing assets</li> <li>-Reuse and focus on keeping material longevity</li> </ul>
Ideal sustainable organization	<ul style="list-style-type: none"> <li>- Clarifying and implementing social purpose of organization</li> <li>- Advocacy and educational initiatives around CE and sustainability</li> </ul>	<ul style="list-style-type: none"> <li>-Advocacy and educational initiatives around CE and sustainability</li> <li>- Designing out waste and regenerative use of natural materials</li> <li>- Moral obligation towards natural environment</li> </ul>

**Figure 2: Systems thinking approaches applied to managers**

	<b>Functionalist</b>	<b>Interpretative</b>	<b>Complex Adaptive Systems</b>
<b>Principles</b>	<p>All aspects of systems are self-evident and knowable.</p> <p>Decision making is rational and neutral</p> <p>Linear cause and effect.</p> <p>All inputs, processes, and outputs may be quantified and optimized</p>	<p>Meaning is subjective, socially constructed, and not self-evident.</p> <p>Systems and boundaries in conflict require further critical inquiry.</p>	<p>Densely connected networks of agents, self-organization, and emergence.</p> <p>Ongoing learning and bottom up evolution.</p>
<b>Implementation</b>	<p>Quantify all elements of the system, including intangibles.</p> <p>Determine mathematical linkages and cause and effect.</p> <p>Optimize system functioning.</p>	<p>Self-inquiry, self awareness, appreciative inquiry.</p> <p>Dialogue and democratic debate.</p> <p>Surface assumptions, explore tensions between conflicting interpretations.</p>	<p>Build and empower learning networks and bottom up processes.</p> <p>Provide appropriate Incentives for productive bottom up interventions.</p> <p>Disturbing norms and patterns of interaction</p>

Adapted from Porter and Cordoba, (2009)



**Table 1: Examples of BMC practices categorized according to sustainable business, systems thinking and sociomateriality approach**

<b>Sustainable Business Category</b>	<b>Example BMC business practices</b>	<b>Systems thinking approach</b>	<b>Example systems thinking approach</b>	<b>Social/ Material Entanglement: Reflective/ Reflexive practice</b>
Efficiency	Provides warehousing and logistics services at a cheaper and more convenient rate through leveraging their idle logistics operations and expertise.	Functionalist	Offers advice on reducing packaging and improvements to handling of the goods they manage with the aim of saving costs for their clients through better waste management practices. Offsets carbon associated with operations and sources renewable energy sources.	Reflective
Strategic	Undertakes assessment of restaurant waste for clients and facilitates the redesign of processes using closed-loop logic.	Functionalist Interpretative	Engaging customers and other stakeholders in learning and dialogue.  Challenges the meaning of waste in business operations constantly being reviewed.	Reflexive
Ideal	Dairy products manufacturer applying organic and regenerative farming principles. Production process involves recycled packaging, the use of renewable energy and the diversion of waste heat from their machinery to sterilise milk. Sustainability value set that guides decision making and practices – integrated social and environmental purpose	Functionalist Interpretative Complex adaptive systems	Self awareness and reflection in experimenting with their own nutrient production and returning some of their farmland back to pre-colonial bushland. Dairy emerged because they challenged the big grocery retail monopoly that is forcing farmers to provide milk at prices below cost of production. Engages with customers and community in challenging extant business model – raising awareness regarding localised and regenerative practices.	Radical reflexivity