

Unconventional Sources of Innovation and Sustainability: Opportunities, Challenges, and Dilemmas of Technology

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Sustainable innovation emerges and spreads in ways that have not been designed or foreseen by managers or public deciders. A thorough examination of the antecedents, consequences and diffusion of sustainable innovation shows that infrastructures and technologies play an important and often disregarded role in the way such innovation comes to light (Trischler et al., 2020; Zhang et al., 2020).

Sustainability and innovation are often analysed as a human- (employees, users or other stakeholders) driven phenomena (Jerónimo et al., 2020; Lee and Raschke, 2020). Of course, the human factor is a bare necessity, but the analyses are incomplete when they overlook the difficulties that arise and that can be overcome by a technology-oriented perspective. Few managers invest real effort in sustainability. Greening is often a marketing approach to comfort consumers or a specific group of stakeholders. Managers do not invest in sustainability as much as we thought for numerous reasons: because the cost is immediate, and the benefit appears only in the long term, the cost is borne by them and benefits shared by society, consumers are not willing to pay the additional costs for a sustainable product, government fiscal incentives are not well designed, etc. Therefore, management invests only in small, people-based operations when instead technology or infrastructure investment could help to innovate and diffuse sustainable practices.

As an example, Green Product Innovation (GPI) is defined as product innovations that are related to environmental innovation, including the innovation in products that promote energy-saving, pollution prevention, waste recycling, no toxicity, or green product designs (Zhang et al., 2020). Thus, GPI contributes to firms' sustainable competitive advantage through the development of eco-friendly technology. Those technologies improve existing knowledge bases and capacities, thereby adding to the long-term performance of firms or ecosystems that introduced them.

Unconventional sources of innovation are emerging in the literature, partly because of the limitation of the debates about how to encourage large companies to invest in sustainable innovations. Previous work highlighted the role of unconventional people on creativity and innovation (Steiner, 1995) or the specificities of unconventional entrepreneurs or entrepreneurs with unconventional ties (Pagano et al., 2018). Sometimes innovation processes have a dark side (Gebauer et al., 2013), pinpointing the limits of collaboration and creative processes to overcome legal or official limitations. It has been shown that social innovation as an innovation process follows a different journey than other types of innovation (Oeij et al., 2019).

In this Special Issue, we would like researchers to explore the key technological opportunities, challenges and dilemmas related to unconventional sources of innovation and how they contribute to the improvement of the sustainability of individuals, firms, and societies. Researchers should put forward the use of technologies (but without neglecting the human part). Technologies could be the result, the drivers, or the locus of diffusion of sustainable innovation sources.

Possible research questions comprise but are not limited to:

- ***The use of technology by migrants or individuals in developing countries.*** In recent years the use of the term *Jugaad* or reverse innovation has become popular (Agarwal et al., 2019; Burger-Helmchen and Hussler, 2020; Radjou et al., 2012). Innovation developed by migrants or people in developing countries may integrate technology and often incorporate a sustainability perspective. However, little is known about the links between the sources of innovation, technology, and sustainability when driven by survival.
- ***The use of technology for sustainable innovation in rural areas versus cities.*** Nowadays, living in a rural area does not mean to be cut off from the world. Innovations are fostered by the interaction of local knowledge and global networks even in rural areas (Tuitjer and Küpper, 2020). The sharing of knowledge occurs in specific ways (Caporuscio et al., 2020). What is the implication of unexpected generations of innovation linked to sustainability?
- ***How unconventional can teams be to obtain innovation integrating sustainable perspectives?*** Research on the composition of teams that come up with innovations indicates a need for different backgrounds and knowledge bases, but also the “imperious necessity of commonalities” (Neukam, 2017). How unconventional can a team be and still produce proper innovations?
- ***Unconventional crowds or unconventional crowd management for more sustainable innovation?*** Works on crowdsourcing have highlighted the fact that the solution often comes from unexpected sources (Afuah and Tucci, 2012; Tucci et al., 2018). Scholars show that beside the heterogeneity of a crowd, the management of the crowd has an important impact on the result (Schenk et al., 2017). For the specific case of sustainable oriented innovation, how should crowds be managed?
- ***Cultural diversity in organization as drivers of sustainability-oriented innovation?*** Employees of different cultures react differently to suitable issues or to use of technologies (Neukam and Guittard, 2018). However, the recent massive use of communication technology pushed toward more online interaction between members of the same global organizations. Does the use of online work between culturally different people and organizations favour innovation with a sustainable intent?
- ***How do users exploit technologies to develop innovation with a high degree of unconventionality?*** Users are a typical case of unconventional sources of innovation. Recent studies (e.g., Schiavone, 2020) uncovered various examples of how users of new technology generate sustainable, more efficient, innovative solutions to

combat the COVID-19 crisis. The question of what the technological conditions and needs leading to this specific type of user-generated unconventional innovation are requires further attention.

- ***Does unconventional imply unofficial?*** Pushing innovation can be done secretly even in huge firms. Bootlegging is developing in many firms, often to develop riskier projects, more radical innovation (Stephan and Bubenzer, 2019). However, no research investigates if those under-the-radar innovation projects are greener than the official ones. Is bootlegging a way to push innovations that are more sustainable than the official agenda of firms?
- ***Do unconventional innovators more frequently depend on their hierarchical position?*** Different hierarchical levels could have different predispositions to push innovation in ways that colleagues do not expect. From CEA to middle managers to front-line employees, they all have access to different information and can exploit different opportunities. Beyond innovation management practice, the hierarchical position may not be neutral (Mol and Birkinshaw, 2009).
- ***Places and networks for unconventional sustainable innovation.*** The literature studying the importance of places or networks for encouraging innovation recognizes the importance of communities and networks of practice (Akhtar et al., 2019; Füller et al., 2007). Those networks and places influence knowledge flows (Park and Vertinsky, 2016) on innovation and creativity (Mehouachi et al., 2016). However, the positive influence of networks of places and knowledge hubs of bringing forward sustainable innovation is not yet fully known and necessitates further investigation (Figge et al., 2002; Wagner et al., 2019)
- ***Unconventional under time and money pressure.*** Many researchers complain about insufficient financing while others seem to get too much (Dosi et al., 2006). It is true that financial control during the innovating processes is challenging (Bollinger, 2020) and that specific methods are needed for unconventional innovations (Stefani et al., 2019). Financial resources and time are among the scarce resources every entrepreneur and innovator face (Sirén et al., 2020). Does scarcity in those resources favour unconventional innovation or does it imply only marginal innovation? Do we need plenty of resources to produce innovations that are sustainable and consume fewer resources in the future?
- ***Business model revolution with unconventional innovation.*** The evolution of business models is dictated by several factors. In complex settings, the role played by ecosystems and platforms often outweigh other factors (Massa et al., 2018). This is true also for social innovation as well as sustainable endeavours (Gasparin et al., 2020). The technology perspective in those setting is a necessity, but how can unconventional innovation be integrated into business models?
- ***Responsible digital innovation as a force for social value.*** Digital innovation requires the consideration of responsible business principles in the areas of labour relations, corporate citizenship, stakeholders, and environments. While many leading companies jump on the bandwagon of digital transformation without scrupulous ethical considerations, negative consequences of technology use have been seen continuously for individuals, organizations, and societies as a whole (e.g., the system-design failure of Uber's self-driving car and Amazon's sexist AI recruiting tool) (Wang et al., 2020). To address this, it is essential to explore how digital innovation can be navigated to achieve social value through the convergence of technology and humanity.

Submission format and timelines:

Papers submitted to the Special Issue will be subject to the Journal review process and submission guidelines.

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Selected authors submit revision: 1st February 2022

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