

Research Article

Driving Sustainability – Oriented Innovation

Mattias W. Schmitt

PhD student, Allensbach University, Konstanz, Germany

*Corresponding Author

Mattias W. Schmitt

Abstract: Today the terms sustainable development and sustainable innovation are often used. But what is meant by these terms, other than that they in some ways are connected to the terms “green” and “ecological” seen in a long term perspective? How, in turn, are sustainable innovations developed? Studying the literature on the topic leads to the conclusion that there is no precise or established definition of sustainable innovation, sustainability and sustainable development.

Keywords: Innovation; innovation process; innovation project; sustainability; sustainable innovation.

INTRODUCTION

Organizations can innovate to address environmental and social problems — but they need to build the right culture. It’s no surprise that many large multinational corporations are paying increased attention to sustainability-oriented innovation. Faced with mounting challenges and pressure from governments, nongovernmental organizations (NGOs), investors, and employees to be more aware of the environmental and social impacts of business activities, companies are searching for ways to do things differently while also seeking opportunities for growth. As a result, many are attempting to tap into the creativity and entrepreneurial potential of their employees, encouraging them to develop new products, services, or business models that create value for both the company and society.

However, as traditional organizations adopt new technologies and business models, some are finding it difficult to get employees to think like entrepreneurs, which is essential to building an innovative culture that’s committed to solving environmental and social problems.

The terms “sustainability”, “sustainable development”, “sustainable solutions”, and “sustainable innovations” are frequently used, for example, in marketing and sales situations. These terms usually represent positive characteristics.

This paper discusses the background of the terms “sustainable” and “innovation”. The focus is mainly on how to develop new products and services from the point-of-view of their environmental impact ‘from the cradle to the grave’.

Today, “Sustainable Innovation” includes two terms that are popular, but rather unclear. Here, they will here be discussed individually, leading to solutions for carrying out sustainable product development.

History of “Sustainability”

In 1999, the concept of “sustainable development” was articulated in other scientific papers as “a discourse of ethics, which specifies human conduct with regard to good and evil”. (Haughton, 1999) summarized the ideas of sustainable development in “five principles based on equity: futurity – inter-generational equity; social justice – intra-generational equity; transfrontier responsibility – geographical equity; procedural equity – people treated openly and fairly; and interspecies equity – importance of biodiversity”. These discussions led to the conclusion that “the conceptual basis of sustainable development has been weak from the start”.

In 2000, the state-of-the-art of the sustainable development process was summed up as: “three elements to be sustained (Nature, Life Support, and Community) and three elements to be developed

Quick Response Code



Journal homepage:

<http://www.easpublisher.com/easiehl/>

Article History

Received: 30.11.2019

Accepted: 10.12.2019

Published: 27.12.2019

Copyright @ 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

(Bigliardi, 2009; Hult, 1998; Maier, 2018; Kiehne, 2016)

In 2001, “one of the few agreements within the sustainable development debate was that there is no clear agreement on what the term means”. Research continued as the sustainability question became more and more important because of global warming and calculations of fossil fuels reserves. Workshops were organized, but it was concluded that sustainability is “laden with so many definitions that it risks plunging into meaninglessness, at best, and becoming a catchphrase for demagoguery, at worst”.

Innovation Theory

The term “innovation” is apparently derived, from the Latin “novus”, which means new or young or novel. Unfortunately, there is no single, accepted definition of the term “innovation”. Historically, innovation was defined as the introduction of new elements or a new combination of old elements in industrial organizations (Legardeur, 2010; Rothwell, 1992; Rothwell, 1994; Schiederig, 2012; Tidd, 2001; Tidd, 2006; Vadastreanu, 2015).

Later, defined innovation as the process of bringing any new, problem-solving idea into use.

In our times, the terms “Innovation” and “Sustainability”, have both become buzzwords, with no single definition. In general, “Innovation” is a positively loaded term that brings hope in difficult times for actors in the private sector, the public sector, the idealistic (non-profit) sector, as well as for whole economies. However, it is seldom explained in terms of how to create successful innovation. Even more unclear is how to develop “Sustainable Innovations” although we might have an intuitive feeling that the expression refers to the development of something good.

According to conventional understanding, “Innovations” (independent of a definition of the term) are only done in the private sector. However, in reality, they have often been and are being developed in the public sector or in the idealistic (non-commercial) sector. For example, from the public sector we have gained the Internet (CERN), the World Wide Web (DARPA), and new teeth and prostheses made with titanium (Gothenburg University). In the idealistic sector, different open-source solutions have been and are being developed frequently (Damanpour, 1991; Maier, 2018; Damanpour, 1984; Maier, 2019; Niek du Preez, 2006; Olaru, 2013; Ribiere, 2010)

When the new solutions in these sectors mature, they often ‘migrate’ into the private sector to become commercial products. This might be why we perceive innovations as something emerging from the private sector.

Thus, innovations are and must be created and developed in all three sectors, although the aims of the work differ. For the private sector, the main aim is to create a sustainable profit. For the public sector, the main aim is to give better service to the people in the society.

If we think of “innovation” as a substantive - the end result of a long development project - the mission of an “innovation project” is to carry out all its activities on a micro level in an organization in order to develop, market and sell a new product and/or service with the aim that it will be used or consumed. Today, the selling price is often zero, especially in the non-profit sector. An “Innovation Process” includes the work done following this system, led by the innovation project team of an entrepreneur (Chris, 2010; Ellstrom, 2010; Leavengood, 2011).

Neither “Sustainable Development nor “Innovation” is a well-defined term. To describe *what* “Sustainable Innovation” is and *how* it is developed, the following definitions are proposed. A *Sustainable Solution* is a solution that has been developed to be a long-lasting, environmentally responsible solution for the provider (the business), the society and the users

An innovation is a new solution that has been “sold” and is used by more than one user or that is used in at least one use-situation. *The innovation process*, carried out as *an innovation project*, contains all stages from idea generation, development (R&D) and commercialization to an implemented solution on the market (Maier, 2018; Roberts, 2007; Rogers, 1962; Gann, 2007; Hobday, 2005; Huber, 2008)

Sustainability and Organization Performance

A sudden change in the current business era calls for sustainable business models. Therefore, the concept of sustainability has become essential to help firms achieve their performance targets. High sustainability helps firms to improve different processes which make them outperform competitors in the long run. Moreover, Alonso-Almeida *et al.*, suggested that sustainability practices spur a firm’s performance in a difficult time. Hence, managers are strongly recommended to enhance sustainability as it can significantly contribute to firm performance. Two competing theories try to explore the influence of sustainability on firm financial performance; one is the value creating theory and the other is the value destroying theory (Matias, 2006; Mayring, 2003; Roscoe, 2016; Galanakis, 2006; Le Corre, 2006; Maier, 2013; Mel, 2009; Rajeev, 2017).

Value creating theory demonstrates that a firm’s risk is reduced with the adoption of social and environmental responsibility. On the other hand, the destruction theory indicates that firms engaged in social and environmental responsibility lose focus on

profitability but pleases shareholders. However, sustainability is not merely an environmental practice, but it also stimulates deep processes inside organizations that significantly improve financial performance. Therefore, the internal measures of sustainability are often merged with the competitive advantage which significantly improves firm performance in emerging economies such as Pakistan. Where a company faces fierce competition, sustainability in this situation helps to improve firm performance. A recent review concludes that sustainability practices significantly improve financial performance of organizations (Miller, 1999; Naspetti, 2017; Noci, 1999; Oлару, 2013; Perrin, 2017; Piirainen, 2010; Maier, 2013, Maier, 2014; Maier, 2018; Teipal, 2013; Thomé, 2016; Tidd, 1998).

Levels of *sustainable innovation*

Both *sustainable innovation* and *eco-innovation* have been defined as covering the spectrum of levels of innovation from incremental to radical. Whilst there are no absolute or quantifiable definitions and boundaries, four main levels of innovation can be defined in the context of environmental improvement. The below is adapted from Stevels, 1997.

- Level 1 (incremental): Incremental or small, progressive improvements to existing products
- Level 2 (re-design or 'green limits'): Major re-design of existing products (but limited the level of improvement that is technically feasible)
- Level 3 (functional or 'product alternatives'): New product or service concepts to satisfy the same functional need e.g. teleconferencing as an alternative to travel
- Level 4 (systems): Design for a sustainable society.

CONCLUSION

Sustainability-oriented innovation takes many forms — everything from the development of new or improved products or services to the creation of new processes and business models that bring benefits to the environment or the society at large. While the innovations themselves may or may not be disruptive or radical, the idea is to mitigate the negative impacts of existing solutions or, even better, make a positive impact.

In describing environments that are successfully fostering sustainability-oriented innovation, most of the executives and managers we interviewed highlighted the close connection between individual purpose and corporate purpose and the importance of linking the company's long-term interests with the good of society.

A continuing issue raised at the conferences is that there is no established definition for sustainable innovation. Sustainable innovation is nevertheless a

critical dimension of sustainable development (SD) and strategies for achieving sustainable consumption and production (SCP). Innovation is the successful exploitation and commercialization of new ideas. It is far more than the common perception that innovation is only about new ideas or research and development (R&D).

There is no precise or established definition for sustainable innovation, reflecting the more general difficulty in defining the concepts of sustainability and sustainable development. Arthur D. Little (2004) defined 'sustainability-driven' innovation (2/04) as 'the creation of new market space, products and services or processes driven by social, environmental or sustainability issues.' As with general innovation, there is an emerging recognition that sustainable innovation is not just about new concepts but is about commercialization of technologies, products and services and about entrepreneurship.

It can also be about the adoption of new processes and systems at societal level. Sustainable innovation is a process where sustainability considerations (environmental, social, financial) are integrated into company systems from idea generation through to research and development (R&D) and commercialization. This applies to products, services and technologies, as well as new business and organization models.

The term sustainable innovation is used throughout this booklet for consistency with the name and scope of the conferences, which have sought to address the social and ethical as well as environmental and financial dimensions of sustainability. An alternative and equivalent term is *eco-innovation*.

BIBLIOGRAPHY

1. Bigliardi, B., & Ivo Dormio, A. (2009). An empirical investigation of innovation determinants in food machinery enterprises. *European Journal of Innovation Management*, 12(2), 223-242.
2. Chris, E. (2010). *Innovation management; a management literature review of innovation processes models and their implications*.
3. Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of management journal*, 34(3), 555-590.
4. Damanpour, F., & Evan, W. M. (1984). Organizational innovation and performance: the problem of "organizational lag". *Administrative science quarterly*, 392-409.
5. Ellström, P. E. (2010). Practice-based innovation: a learning perspective. *Journal of Workplace learning*, 22(1/2), 27-40.
6. Galanakis, K. (2006). Innovation process. Make sense using systems thinking. *Technovation*, 26(11), 1222-1232.

7. Gann, D., & Dodgson, M. (2007). Innovation Technology: How new technologies are changing the way we innovate. NESTA-National Endowment for Science, Technology and the Arts, London;cited 2015 June 10].
8. Hobday, M. (2005). Firm-level innovation models: perspectives on research in developed and developing countries. *Technology analysis & strategic management*, 17(2), 121-146.
9. Huber, J. (2008). Technological environmental innovations (TEIs) in a chain-analytical and life-cycle-analytical perspective. *Journal of Cleaner Production*, 16(18), 1980-1986.
10. Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. *Journal of marketing*, 62(3), 42-54.
11. Kiehne, J., Olaru, M., Sven, J. I., & Maier, D. (2016). Does Globalization drive Innovation? Evidence from the European Union.
12. Le Corre, A., & Mischke, G. (2006). The Innovation Game. A New Approach to Innovation Management and R&D, *Springer US*.
13. Le Corre, A., & Mischke, G. (2006). *The Innovation Game. A New Approach to Innovation Management and R&D*, Springer US.
14. Leavengood, S. A. (2010). Identifying best quality management practices for achieving quality and innovation performance in the forest products industry.
15. Legardeur, J., Monnier, B., & Choulier, D. (2010). New projects evaluation method for the 24h of innovation. *Proceedings of ERIMA*, (2010), 177-185.
16. Maier A., Brad, S., Nicoară, D., & Maier, D. (2013). Innovation by developing human resources, ensuring the competitiveness and success of the organization, Proceedings of 2nd World Conference on Business, Economics and Management–BEM 2013, April 25 – 28 2013, Antalya, Turkey.
17. Maier, A., Keppler, T., & Maier, D. (2014, May). Innovation the new trend in today's challenging economy. In *The Bucharest University of Economic Studies, The 13th International Conference on Informatics in Economy, Education, Research & Business Technologies. Bucharest, Romania* (pp. 15-18).
18. Maier, D., Olaru, M., & Maier, A. (2013, September). Integrating concepts of innovation and creativity-a key to excellence in business. In *sn The 8th European Conference on Innovation and Entrepreneurship. Brussels, Belgium* (pp. 19-20).
19. Maier, D. (2018). Integration of management systems-key issues for the sustainable development of an organization. *International Journal of Advanced Engineering and Management Research*, 3(6).
20. Maier, D. (2018). Product and process innovation: a new perspective on the organizational development. *International Journal of Advanced Engineering and Management Research*, 3(6).
21. Maier, D. (2018). Quality and innovation as a source of sustainability in construction, *International Journal of Advanced Engineering and Management Research*, 3(6), <http://ijaemr.com/view2.php?issue=6>
22. Maier, D. (2018). Study on the concerns of Romanian enterprises in the field of innovation in the context of implementing an integrated qualityenvironment-security management system. *International Journal of Advanced Engineering and Management Research*, 3(6).
23. Maier, D. (2018). The Romanian national innovation performance in the EU context. *International Journal of Advanced Engineering and Management Research*, 3(6).
24. Maier, D. (2019). Researchers approaches on innovation process in the construction sector, *International Business Information Management Association (IBIMA) 34th IBIMA Conference, 13-14 November 2019, Madrid, Spain*.
25. Matias, H.C., & Coelho, D.A. (2006). *Innovation in the Organisation of Management Systems as a Means of Survival and Growth of SMEs*.
26. Mayring, P. (2003). Qualitative Content Analysis, 8th ed.; Beltz Verlag: Weinheim, Germany.
27. De Mel, S., McKenzie, D., & Woodruff, C. (2009). *Innovative firms or innovative owners? Determinants of innovation in micro, small, and medium enterprises*. The World Bank.
28. Miller, M.L., & Morris, L. (1999). *Fourth Generation R & D: Managing Knowledge, Technology and Innovation*, John Wiley & Sons, Inc., Canada.
29. Naspetti, S., Mandolesi, S., Buysse, J., Latvala, T., Nicholas, P., Padel, S., ... & Zanoli, R. (2017). Determinants of the acceptance of sustainable production strategies among dairy farmers: Development and testing of a modified technology acceptance model. *Sustainability*, 9(10), 1805.
30. Du Preez, N. D., Louw, L., & Essmann, H. (2006). An innovation process model for improving innovation capability. *Journal of high technology management research*, 17, 1-24.
31. Noci, G., & Verganti, R. (1999). Managing 'green'product innovation in small firms. *R&d Management*, 29(1), 3-15.
32. Olaru, M., Hohan, A., Maier, A., & Maier, D. (2013). Metrics for innovation of product–the basis for continuous improvement of an organization. *organization*, 8, 9.
33. Olaru, M., Maier, D., Maier, A., & Nicoară, D., (2013). Establishing the basis for the development of an organization by adopting the integrated management systems: comparative study of various models and concepts of integration, 2nd World Conference on Business, Economics and Management–BEM 2013, April 25 – 28 2013, Antalya, Turkey.

34. Perrin, A., Wohlfahrt, J., Morandi, F., Østergård, H., Flatberg, T., De La Rúa, C., ... & Gabrielle, B. (2017). Integrated design and sustainable assessment of innovative biomass supply chains: A case-study on miscanthus in France. *Applied Energy*, 204, 66-77.
35. Piirainen, K., Kortelainen, S., Elfvengren, K., & Tuominen, M. (2010). A scenario approach for assessing new business concepts. *Management Research Review*, 33(6), 635-655.
36. Rajeev, A., Pati, R. K., Padhi, S. S., & Govindan, K. (2017). Evolution of sustainability in supply chain management: A literature review. *Journal of Cleaner Production*, 162, 299-314.
37. Ribiere, V. M., & Tuggle, F. D. (2010). Fostering innovation with KM 2.0. *Vine*, 40(1), 90-101.
38. Roberts, E. B. (2007). Managing invention and innovation. *Research-Technology Management*, 50(1), 35-54.
39. Rogers, E.M. (1962). *Diffusion of Innovations*; Free Press of Glencoe: New York, NY, USA.
40. Roscoe, S., Cousins, P. D., & Lamming, R. C. (2016). Developing eco-innovations: A three-stage typology of supply networks. *Journal of Cleaner Production*, 112, 1948-1959.
41. Rothwell, R. (1992). Successful industrial innovation: critical factors for the 1990s. *R&D Management*, 22(3), 221-240.
42. Rothwell, R. (1994). Towards the fifth-generation innovation process. *International marketing review*, 11(1), 7-31.
43. Schiederig, T., Tietze, F., & Herstatt, C. (2012). Green innovation in technology and innovation management—an exploratory literature review. *R&D Management*, 42(2), 180-192.
44. Tejpal, G., Garg, R. K., & Sachdeva, A. (2013). Trust among supply chain partners: a review. *Measuring Business Excellence*, 17(1), 51-71.
45. Thomé, A.M.T., Scavarda, A., Ceryno, P.S., & Remmen, A. (2016). Sustainable new product development: A longitudinal review. *Clean Technol. Environ. Policy* 2016.
46. Tidd, J., & Bessant, J. R. (2018). *Managing innovation: integrating technological, market and organizational change*. John Wiley & Sons.
47. Tidd, J. (2001). Innovation management in context: environment, organization and performance. *International journal of management reviews*, 3(3), 169-183.
48. Tidd, J. (2006). *Innovation Models*, Science and Technology Policy Research Unit, Paper 1, *Imperial College London*.
49. Vadastreanu, A. M., Maier, D., & Maier, A. (2015, April). Business success by improving the innovation management. In *Proceedings of the 14th International Conference on Informatics in Economy International Conference on Informatics in Economy, Education, Research & Business Technologies*.