



Circular Economy Business Model: Bibliography Analysis and Future Agenda

I Wayan Edi Arsawan
Department of Business Administration
Politeknik Negeri Bali
Kuta Selatan, Badung Bali, Indonesia
wayanediarsawan@pnb.ac.id

I Made Dwi Ari Suta Atmaja
Department of Electrical Engineering
Politeknik Negeri Bali
Kuta Selatan, Badung Bali, Indonesia
arisuta@pnb.ac.id

Cokorda Gde Putra Yudistira
Department of Business Administration
Politeknik Negeri Bali
Kuta Selatan, Badung Bali, Indonesia
gedeputrayudistira@pnb.ac.id

Ni Kadek Dessy Hariyanti
Department of Business Administration
Politeknik Negeri Bali
Kuta Selatan, Badung Bali, Indonesia
dessyhariyanti@pnb.ac.id

Ni Made Kariati
Department of Business Administration
Politeknik Negeri Bali
Kuta Selatan, Badung Bali, Indonesia
dekariati@pnb.ac.id

Putu Ayu Darmayanti
Faculty of Economic and Business
Universitas Udayana
pt_ayudarmayanti@unud.ac.id

Abstract— Circular economy business model has attracted attention in last decade regarding the increasing of environmental awareness and sustainability. However, the scientific and research content of the concept is so shallow and disorganized that it is still a collection of vague ideas separated from several fields of science. This study aimed to measure the visual trends in circular economy business model. This survey identified keywords related to circular economy to find and identify related articles in the Scopus database for 500 articles published from 2018 to 2022. The findings are a visual trend of an increasing number of publications each year, academic affiliation, author, and article subject area, keywords, and authorship networks. This literature review provides evidence that circular economy business model thinking attracts academic researchers to make policy-relevant regarding environment.

Keywords— *circular economy; business model; bibliometrics analysis; visual trend*

I. INTRODUCTION

Given the importance of the role of business organizations in saving the environment, it is very important to increase attention to these efforts [1]. These efforts can be from internal organizational factors such as environmental orientation and awareness [2], environmental commitment [3], green innovation [4], and pro-environmental behavior [5]. Meanwhile, from the external side, optimizing green economic incentives [6], and green supply chain partners [7] so that organizations contribute to sustainability [8], [9].

The circular economy concept has been introduced as a strategic step to save the environment. And in the various available works of literature, the interest of researchers has increased sharply, as evidenced in recent years research on the circular economy has attracted the attention of researchers from all over the world. To bridge the research mechanism on the circular economy into a circular economy business model is very necessary. This business model change has an important impact on reducing waste from production [10], [11], increasing eco-design-based products [12], and increasing global value [13] to build the reputation and legitimacy of an organization towards the environment [14].

Circular economy topic is increase in last ten years, but this field still underdeveloped [12] due of many limitations, unexplored research topics, and still scattered only in industrial with highly readiness level [15]. Its implementation is also constrained by technology [16], [17] so that it is not optimal in increasing productivity and open innovation [18]. So, this literature gap has become a motivation for mapping bibliographic-based literature so that it can provide a broader perspective. Based on these reasons, this study aims to highlight research trends in the circular economy. The results of the research can be used as guidance in increasing the number of researches and the potential to build expertise based on interdisciplinary collaboration. So far, the trend of CE research has focused mainly on related fields, carried out on single case studies, or literature reviews without visualization. To our knowledge, there are no studies that provide a

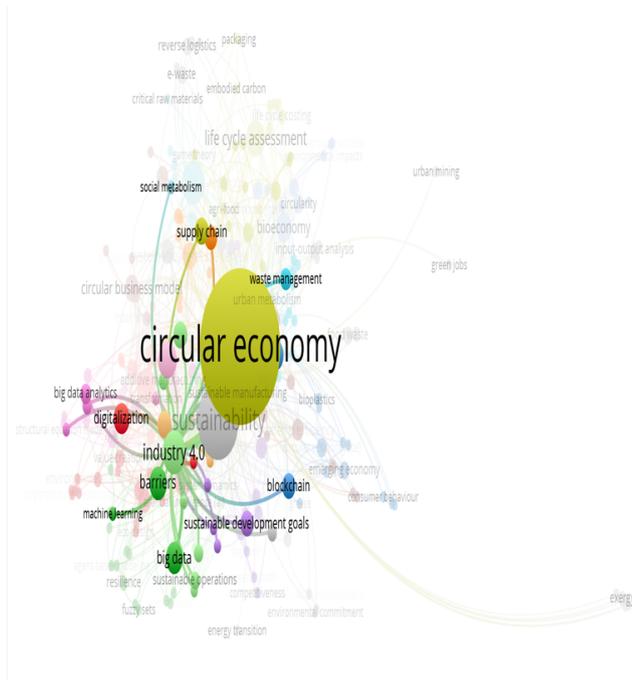


Figure 3. Network circular economy and technology

The circular economy is related to technology topics such as digitalization, industry 4.0, and big data. This shows the trend of research using big data analysis to predict the potential and opportunities for business development in the future. Given the increasing competition in the industry, big data, digitization and the application of technology are very reasonable reasons.

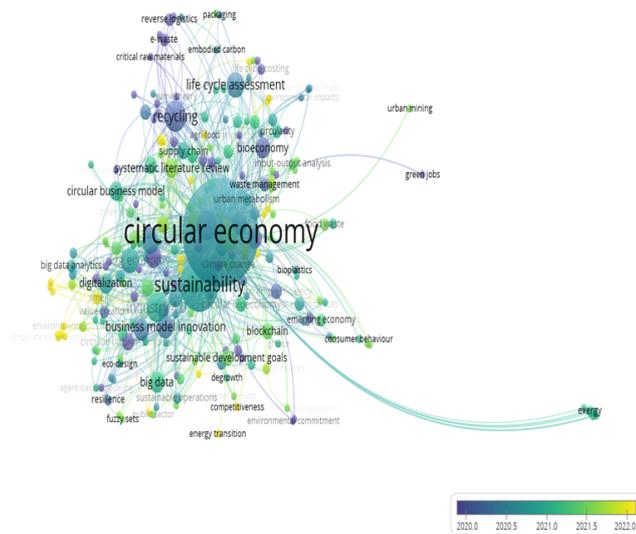


Figure 4. Overlay Visualization

Figure 4 shows the results of the overlay visualization analysis. Most of the circular economy research was carried

out in early 2021 in dark green. But many are connected with other topics so it is still a topic of interest until early 2022 as shown in the picture, the circular economy is connected with the yellow color which has small circles. This means that the topic of the circular economy is increasingly being linked to various field areas. Such as related to climate change, sustainable development goals, environmental sustainability, food waste, waste management, eco-industrial park, artificial intelligence (marked by bright green color), micro foundation, competitiveness, product recovery, energy transfer, green recovery, corporate social responsibility, social value, circular product design, environmental impact, blockchain technology (marked in yellow). Old topics related to the circular economy to be researched in 2020 are recycling, reverse logistics, business model innovation, emerging economy, economy, environmental commitment, and green jobs (marked in dark purple). The results of the analysis output also prove that the circular economy is increasingly attractive as part of the organization's efforts to improve environmental strategies. Implementation of environmentally-oriented strategies can be translated in the form of green innovation [4], green commitment [3], green human resource management and green orientation [9]. Obviously, the strategic implementation is an important pillar of the organization in environmental preservation towards sustainable development goals.

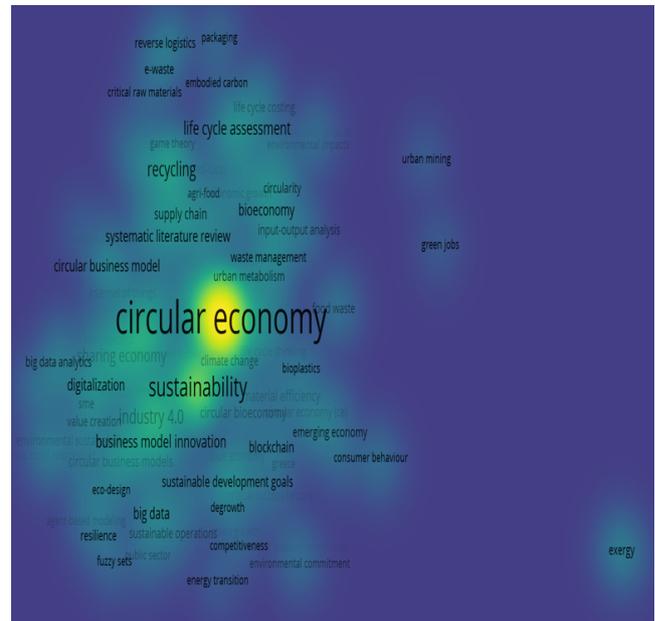


Figure 5. Density Visualization

From Figure 5 it can be seen that the circular economy has the lightest color while other topics do not, with an even distribution. Only the topic of sustainability is a little clear. This means that research on the topic of the circular economy is mostly related to sustainability and research in 2010-2022 on the circular economy is associated with many things, not just a few topics.

From the results of the three visualizations, currently, research on the circular economy has been extensively investigated concerning various topics not only in science but also in social science. Research on the circular economy in industry 4.0 leads to the use of big data, blockchain technology, artificial intelligence, and digitalization. Of the four topics, blockchain technology is the latest topic related to the circular economy where the results of the overlay visualization show that research on the topic will be conducted in 2022. While most research related to the circular economy from 2018-2022 is on sustainability which can be seen from the results of network analysis and density visualization. Thus, looking at the composition of the three outputs of the analysis above, research on the circular economy business model is an area of research that has the potential to continue to grow in the future. Given the increasing demands of businesses oriented to saving the environment [9], the circular economy business model is a strategic step to implement environmental awareness, commitment and environmental strategies. The expected impact is that organizations increasingly understand patterns of saving the environment to build sustainable development [17].

IV. CONCLUSIONS

This study aims to measure visual trends regarding the circular economy business model and technology. The findings of this systematic literature review provide evidence that thinking about how technology impact on circular economy business model attracts attention from academic researchers through the visualization of related topics. The results of the study also found many opportunities to explore future research. This study has a limitation, namely that it does not measure the contribution and impact of the research seen from the quotations. The analysis is based solely on the Scopus dataset drawn specifically on ScienceDirect, while there are more relevant papers not indexed by Scopus, for that, future research may analyze from other database sources.

ACKNOWLEDGMENT

Thank you to the Ministry of Education and Cultural of the Republic of Indonesia, the Directorate of Research and Community Service (DRPM) for the research grant for the year 2022, and Politeknik Negeri Bali for providing this research opportunity.

REFERENCES

- [1] Y. Liu and Y. Bai, "An exploration of firms' awareness and behavior of developing circular economy: An empirical research in China," *Resources, Conservation and Recycling*, vol. 87, pp. 145–152, 2014, doi: 10.1016/j.resconrec.2014.04.002.
- [2] F. Saleem, S. S. Qureshi, and M. I. Malik, "Impact of environmental orientation on proactive and reactive environmental strategies: Mediating role of business environmental commitment," *Sustainability (Switzerland)*, vol. 13, no. 15, 2021, doi: 10.3390/su13158361.
- [3] T. Galkina, "International ECOpreneurship: Environmental commitment and international partner selection of Finnish firms from the energy sector," *Journal of International Entrepreneurship*, vol. 19, no. 2, pp. 300–320, 2021, doi: 10.1007/s10843-021-00286-8.
- [4] I. W. E. Arsawan, V. Koval, G. Duginets, O. Kalinin, and I. Korostova, "The impact of green innovation on environmental performance of SMEs in an emerging economy," in *E3S Web of Conferences*, 2021, vol. 255, p. 1012.
- [5] J. G. York, "Pragmatic sustainability: Translating environmental ethics into competitive advantage," *Journal of Business Ethics*, vol. 85, no. SUPPL. 1, pp. 97–109, 2009, doi: 10.1007/s10551-008-9950-6.
- [6] B. Clemens, "Economic incentives and small firms: Does it pay to be green?," *Journal of Business Research*, vol. 59, no. 4, pp. 492–500, 2006, doi: 10.1016/j.jbusres.2005.08.006.
- [7] J. Liu, Y. Feng, Q. Zhu, and J. Sarkis, "Green supply chain management and the circular economy: Reviewing theory for advancement of both fields," *International Journal of Physical Distribution and Logistics Management*, vol. 48, no. 8, pp. 794–817, 2018, doi: 10.1108/IJPDLM-01-2017-0049.
- [8] K. W. Green, L. C. Toms, and J. Clark, "Impact of market orientation on environmental sustainability strategy," *Management Research Review*, vol. 38, no. 2, pp. 217–238, 2015, doi: 10.1108/MRR-10-2013-0240.
- [9] B. Sezen and S. Y. Çankaya, "Effects of Green Manufacturing and Eco-innovation on Sustainability Performance," *Procedia - Social and Behavioral Sciences*, vol. 99, pp. 154–163, 2013, doi: 10.1016/j.sbspro.2013.10.481.
- [10] M. Singh, M. Brueckner, and P. K. Padhy, "Environmental management system ISO 14001: Effective waste minimisation in small and medium enterprises in India," *Journal of Cleaner Production*, vol. 102, pp. 285–301, 2015, doi: 10.1016/j.jclepro.2015.04.028.
- [11] Y. A. Fatimah, K. Govindan, R. Murniningsih, and A. Setiawan, "Industry 4.0 based sustainable circular economy approach for smart waste management system to achieve sustainable development goals: A case study of Indonesia," *Journal of Cleaner Production*, vol. 269, p. 122263, 2020, doi: 10.1016/j.jclepro.2020.122263.
- [12] C. V. H. Schmidt, B. Kindermann, C. F. Behlau, and T. C. Flatten, "Understanding the effect of market orientation on circular economy practices: The mediating role of closed-loop orientation in German SMEs," *Business Strategy and the Environment*, no. July, pp. 1–17, 2021, doi: 10.1002/bse.2863.
- [13] F. Granek, "Business value of toxics reduction and pollution prevention planning," *Journal of Cleaner Production*, vol. 19, no. 5, pp. 559–560, 2011, doi: 10.1016/j.jclepro.2010.09.012.
- [14] N. Soewarno, B. Tjahjadi, and F. Fithrianti, "Green innovation strategy and green innovation: The roles of green organizational identity and environmental organizational legitimacy," *Management Decision*, vol. 57, no. 11, pp. 3061–3078, 2019, doi: 10.1108/MD-05-2018-0563.
- [15] N. P. S. Suryantini, I. Wayan Edi Arsawan, N. P. A. Darmayanti, S. Moskalenko, and T. Gorokhova, "Circular economy: Barrier and opportunities for SMEs," *E3S Web of Conferences*, vol. 255, 2021, doi: 10.1051/e3sconf/202125501017.
- [16] B. Zhang, S. Yang, and J. Bi, "Enterprises' willingness to adopt/develop cleaner production technologies: An empirical study in Changshu, China," *Journal of Cleaner Production*, vol. 40, pp. 62–70, 2013, doi: 10.1016/j.jclepro.2010.12.009.
- [17] X. Agnello, J. Naveen, M. Ravichandran, and J. Balamurugan, "Clean Technology and its Efficacy: Strategies of Environmental Management," *Journal of Environmental and Social Sciences*, vol. 2, no. 2, pp. 110–116, 2015, [Online]. Available: <http://opensciencepublications.com/fulltextarticles/ESS-2454-5953-2-110.html>
- [18] B. Surya, F. Menne, H. Sabhan, S. Suriani, H. Abubakar, and M. Idris, "Economic growth, increasing productivity of smes, and open innovation," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 7, no. 1, pp. 1–37, 2021, doi: 10.3390/joitmc7010020.
- [19] N. J. van Eck and L. Waltman, "Software survey: VOSviewer, a computer program for bibliometric mapping," *Scientometrics*, vol. 84, no. 2, pp. 523–538, 2010, doi: 10.1007/s11192-009-0146-3.
- [20] L. Xie, Z. Chen, H. Wang, C. Zheng, and J. Jiang, "Bibliometric and Visualized Analysis of Scientific Publications on Atlantoaxial Spine Surgery Based on Web of Science and VOSviewer," *World Neurosurgery*, vol. 137, no. February, pp. 435–442.e4, 2020, doi: 10.1016/j.wneu.2020.01.171.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

