

SUSTAINABLE BUSINESS MODELS RESEARCH: A BIBLIOMETRIC ANALYSIS

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Abstract: A variety of studies are being developed to investigate sustainable business models. This research is part of a wider one and aims at the theoretical deepening of the existing paradigms in the literature. The realization of the bibliometric analysis in the field of sustainable business models was mainly influenced by the extent of this type of business models. The data in this study were collected through the use of bibliometric tools, identifying and then analyzing the most influential and cited publications from the Scopus and Google Scholar Metrics platforms for the same time periods. The keyword phrase was searched in the databases as a first step that initiates the continuation of this analysis. This action helps to obtain valuable data for the purpose of this study. The inspiration of the topic is guided by two objectives formulated in the form of research questions: In empirical studies how is the sustainability of a business evaluated? What are the dimensions that lead to the sustainability of business models, the focus on which can reveal previously unexplored directions? We emphasize that from the total of 20 studies selected for the bibliometric analysis, 14 of them are original articles and 6 are review analyses. Some criteria or exponents of research units serve to conclude the findings and conclusions of the bibliometric analysis. The construction of a comprehensive visual analysis represented in the following figures and graphs corresponds precisely to the results achieved by this research. Then, in this framework we integrate the framework findings-results for the search for sustainable business models. The findings of this study indicate that the trend of the production of academic studies in the field of sustainability of business models is relatively positive. We aim to identify the state of research and the possibility of completing it with a current documentary or empirical analysis useful for the two countries, Romania and Albania. On sustainable business models, in the future we propose to do a case study on the evolution of the production activity system from eco-design and the effective implementation of eco-innovative practices in these two countries, in order to capitalize on the results obtained from the bibliometric analysis.

Keywords: bibliometric analysis; sustainable business models; current trends; divergent points; entrepreneurial sustainability.

JEL classification: F18; F21; O10; O47

1. Introduction

Bibliometric analysis is a research method that Hawkins (1977: 13) defines as "the quantitative analysis of the bibliographic features of a body of literature". The term

"bibliometrics" was coined in 1969 by Alan Pritchard. Pritchard (1969) in an attempt to disambiguate the term "statistical bibliography", defined bibliometrics as the application of mathematical and statistical methods to books and other media, aiming to elucidate the processes of written communication and also the nature of the development of a discipline. From the specialized literature research in the interest of our study, we highlight the fact that the term "sustainable development" was used for the first time in the Brundtland Report, which was published in 1987 by the World Commission on Environment and Development of the United Nations (Brundtland, 1985: 26).

2. Methodology and data collection

This study is guided by two objectives formulated in the form of research questions: In empirical studies, how is the sustainability of a business evaluated? What are the dimensions that lead to the sustainability of business models, the focus on which can reveal previously unexplored directions?

Analysis of most influential and cited publications by the Scopus and Google Scholar Metrics platforms, for the same time periods were used to collect the data. The research methodology includes as selection criteria: frequency of citations; academic publications; time period: 2019-2023. The aggregated results of the Scopus search for the terms "sustainable business models" are shown in Figure 1. The number of publications investigating sustainable business models has grown remarkably year-on-year, from 1,806 in 2020 to 2,613 articles published in 2023. A particular increase is also noticeable by analyzing the total annual number of citations for this field. The flow of citations has increased significantly from year to year, from 8 resulting in 2021 to 2,860 citations resulted in 2023.

This scientific expansion in the field of sustainable business models refers to the amplification of research studies but also the support offered by business practitioners for the development of entrepreneurial stability trends, possibly using sustainable business models (Figure 1).

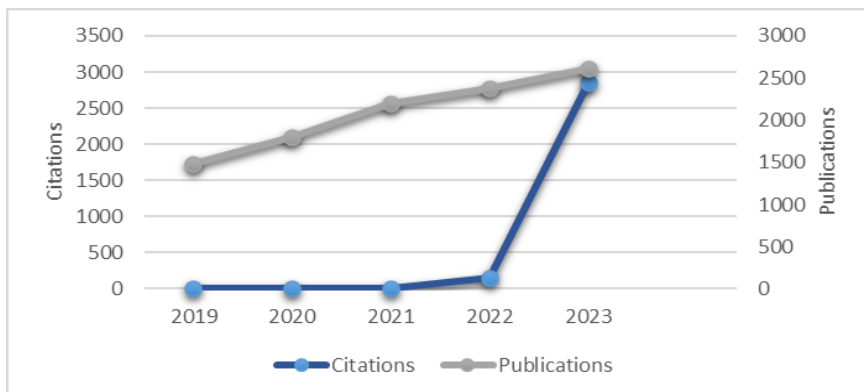


Figure 1: Annual indicators of publications and citations in the field of sustainable business models (SBM).

Source: Scopus <file:///C:/Users/Perdorues/Desktop/Scopus%20-%20Citation%20overview%202.pdf>, accessed in 23.12.2023

Using "sustainable business models" as a search key on the Scopus platform yields a total number of 2,613 scientific articles published in 2023. Using some of Scopus' built-in functions, we highlighted a total number of 2,860 citations for the year 2023 related to the investigated field in the interest of our study (Table 1).

Table 1: Time distribution of the flow of citations resulting from the phrase "sustainable business models" in the Scopus database.

Citations	<201	201	202	202	202	202	Subtotal	>202	Total
Total	3	1	0	8	150	2860	3019	166	3185

Source: Scopus <file:///C:/Users/Perdorues/Desktop/Scopus%20-%20Citation%20overview%202022.pdf>, accessed in 23.12.2023

Eventually, an extraordinary amplification of the interest in the development of sustainability in the entrepreneurial sector is highlighted. A variety of studies are being developed to investigate sustainable business models. However, it is found that bibliometric analyzes in this discipline are still limited, possibly not all dimensions of sustainable business models are covered by the analysis of published articles. The development of literature should be on such a trajectory that provokes "design thinking" and "innovative thinking" in this field.

In the elaboration of the bibliometric analysis, the Google Scholar Metrics search engine was also used, which practically offers more simplified research methods for researchers to quickly find, select and evaluate the visibility and influence of recent articles from a wide range of academic publications. Scholar Metrics provides the option to browse the most cited publications, which are ranked by five-year h-index (h5-index) and h-median (h5-median) values. The phrase "sustainable business models: a review" was searched in the Google Scholar database as a first step initiating the continuation of this analysis. To see articles as well as citations based on metrics, we use the "Metrics" option. In the interest of this study, column no. 51 "Sustainability" was selected, which corresponds to the number 185 in the h5-index column and the number 238 in the h5-median column. From the displayed publications we find a total number of 185 articles. The intention is to filter and select the scholarly materials that best match our search. The selection and research is done manually by browsing the contents of those papers which, according to Google Scholar Metrics, are among the most important in the target field. From 185 scientific articles resulting from the Google Scholar Metrics filters, we manually selected 10 scientific papers that rank first among other papers in terms of word occurrence flow and citation intensity, following in this sense also a chronological line of the studied time interval, specified for the time period of the last 5 years.

In this study, the 10 most cited scientific articles were selected from the Scopus platform and 10 scientific articles that are on top from the Google Scholar Metrics platform. Of the 20 studies selected for the bibliometric analysis, we note that 14 of them are original articles and 6 are review analyses. This bibliometric analysis corresponds predominantly to original research articles due to the fact that these articles provide a detailed account of the techniques and methods used. Original research articles due to academic qualities are the most common types of research articles. An original research paper often includes the background of the study,

defined research questions and hypotheses, methods and instruments, results, interpretation of findings and a discussion of possible implications, analytical and experimental studies, responses to surveys/interviews, or detailed observations.

Although in low numbers, research also includes review analyses. This is because reviews investigate and identify gaps in research, thereby providing important insights or valuable explanations for possible new studies.

We highlight the argument according to which the review type analyzes were considered necessary to carry out this bibliometric analysis considering their conceptual context as a whole; the importance of the fact that their content corresponds to the elaboration of bibliometric analyzes (quantitative research methods) in support of the sustainability of business models; the influx of citations; providing relevant information for deepening the study of the sustainability of business models.

3. Aggregated results of the Scopus search for the terms "sustainable business models"

The search using the Scopus platform resulted in a total of 11,741 scientific publications in the field of sustainable business models. This automatic filter eventually served to select academic papers that are first ranked by citation intensity and keyword usage flow that correspond to the purpose of this study. Then ten academic publications were selected, which, in our opinion, are of high interest according to the purpose of the study. But this purpose of study is subordinated to two objectives that we have formulated in the form of research questions: In empirical studies, how is the sustainability of a business evaluated? What are the dimensions that lead to the sustainability of business models, the focus on which can reveal previously unexplored directions?

This stage included a series of research on the content of the text, according to the intensity of the keyword "sustainable business models", the analysis of specific points of view that are in a way a replica of the research interests of this paper. The trend of the production of academic studies in the field of sustainability of business models is relatively positive with a pronounced upward turn in 2023. This is seen not only by the intensity of publications, but also by the flow of citations. The specific roots of the term "sustainability" in business models appear quite quickly after we analyzed in chronological order the appearance of publications in this field. But deeper specifications in the field of sustainable business models have only recently intensified remarkably. Regardless of the fact that the platform used in the interest of this study, Scopus, is a reliable data software, the volume of citations for published articles is clearly low compared to what results in Google Scholar Metrics. This is probably due to the fact that this software requires a subscription, while Google Scholar Metrics allows free searches.

The bibliometric analysis of researchers carried out on the Scopus platform shows that the most influential researchers in the field of sustainable business models are Rusch, M., Schöggel, JP, Baumgartner, RJ.; Khan, SAR., Tabish, M., Zhang, Y.; Broccardo, L., Zicari, A., Jabeen, F., Bhatti, ZA., and the researcher must rely on them to theorize the field and surround their theories with extraordinary depth of research.

Looking at the cumulative number of publications and the increased flow of citations, we can see that the popularity and interest in the application of sustainable business models in the field of enterprises has increased sharply in 2023. This is a positive algorithm in terms of further progress and objective application of the notion of "sustainability" in business practices. The process and stages of the bibliometric study discuss the progress of sustainable business models that possibly includes, among others, the flow of word occurrence, the most influential researchers in this field and the most critical scientific articles that have an important impact on the development of this field. Eventually the selection is based on a way of reviewing the titles, abstracts, introduction, findings and conclusions of each scientific publication. The development of this study could favor the increase in the number of readers familiar with the field of sustainable business models, but also allow the scientific team to advance in knowledge, integrity, the expansion of the conceptual sphere as well as rational thinking in the field of business.

The study highlights the existence of some gaps. This is because the sustainability of business models has a wide scope of academic studies in the literature, but not all aspects have been treated to the same extent, to create new perspectives in the development of business model sustainability.

Even current new concepts dealing with the sustainability of business models can be appreciated to be little mentioned or addressed in the literature, often even with accentuated gaps due to superficial analyzes that often discuss the concept but not the essence, purpose and perspectives in knowledge, usage, analytics.

4. Aggregated results of the Google Scholar Metrics search for the terms "sustainable business models"

The search using Google Scholar Metrics resulted in a total of 185 publications, with 175 publications removed after manual inspection of publication abstracts and citation intensity. This manual filter served to select the academic papers that make up the top ten of the classification. The trend of the production of academic studies in the field of sustainability of business models is relatively positive. This results not only from the intensity of publications, but also from the flow of citations. After analysing the succession of publications in this field, the results show early research.

Data analysis performed through this database helped to obtain valuable data for the purpose of this study. This approach has been accomplished not only because of the wide access to published articles, but also because of the convenience it offers as an easy-to-use platform. Among other things, being a free platform with simplified research methods allows obtaining the expected results, a fact that can be seen by comparing the flow of citations between the articles published in the Scopus database and those published in Google Scholar Metrics. In the latter, an amplified focus of the flow of citations is observed, many times in number compared to the articles published in Scopus. The bibliometric analysis of researchers by Google Scholar Metrics shows that the most influential researchers in the field of sustainable business models are Parida, V., et al.; Alshehhi, A., et al.; and Nosratabadi, S., et al., and the researcher must rely on them for the theoretical part of the field and to understand their theories and depth of research. Looking at the

accumulated number of publications, we can see that the popularity of the application of sustainable business models in the field of enterprises has increased sharply. The process and stages of the bibliometric study discuss the progress of sustainable business models that possibly includes, among others, the flow of word occurrences, the most influential researchers in this field and the most critical scientific articles that have an important impact on the development of this field. Eventually the selection is based on a way of reviewing the titles, abstracts, introduction, findings and conclusions of each scientific publication.

5. Findings and discussions

This analytical framework serves to build a more comprehensive visual structure represented in the following figures, referring to the conclusions drawn from the study. The bibliographic analysis highlights, among other things, precisely the concentration of definitions in the studied literature. Regarding the probability or intensity of in-depth knowledge, expressed in creative definitions of sustainability, from the analysis of the 20 scientific articles studied, it appears that in 18 of these 20 academic publications ≤ 1 (one or more) definitions are indeed used, probability determined for each item.

There is a positive trend in innovative insight, in-depth skills and scientific research related to the expansion of sub-fields that make up sustainable business models. We conclude that the literature tends to summarize rational thinking in definitions worthy of in-depth knowledge of sustainability in business models.

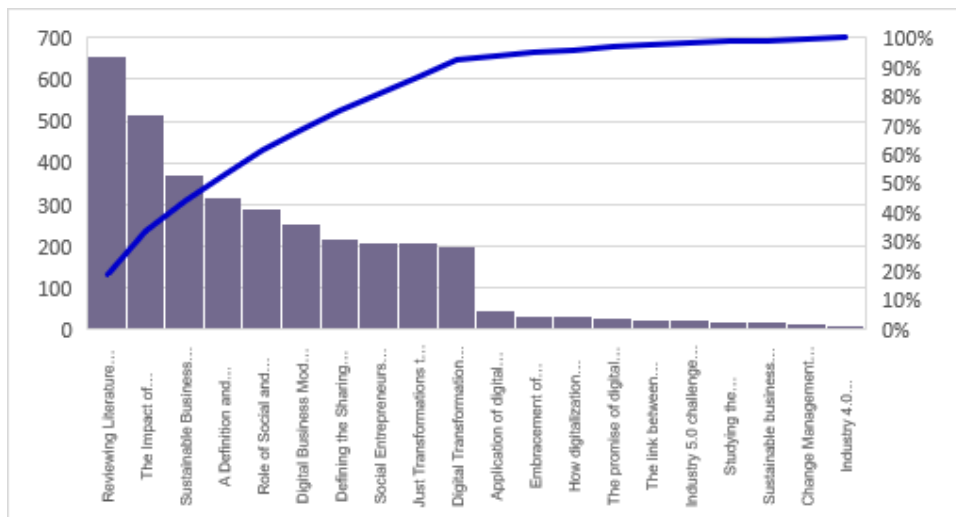


Figure 2: Frequency of citations for the ten scientific articles included in the study
Source: Author's analysis, based on Scopus and Google Scholar Metrics

We refer that from our reviewed range of 20 academic articles in total that essentially correspond to the field of sustainability of business models, we find that ten of them have been articulated < (in more than) 100 citations (Figure 2).

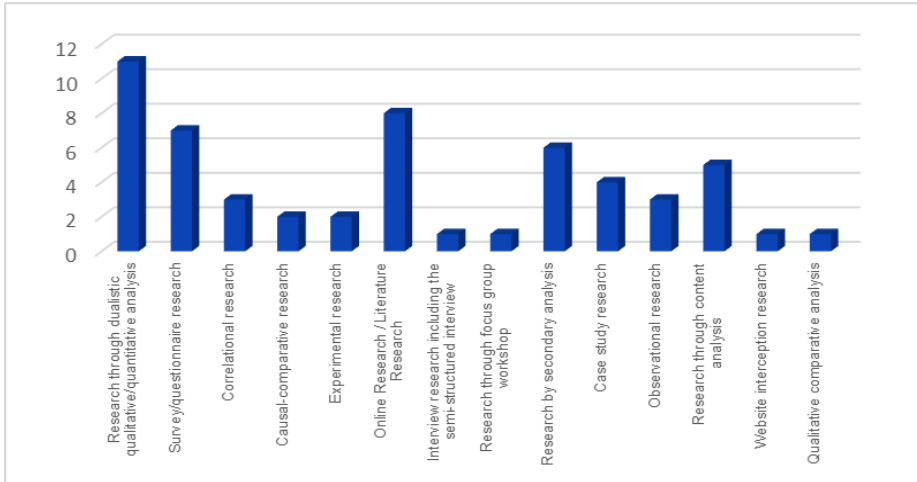


Figure 3: The weight of the data modeling methods used in the development of academic publications

Source: Author's analysis, based on Scopus and Google Scholar Metrics

We conclude with the opinion that the most used tool for academic deepening consists precisely in the dualistic analysis of data through the quantitative and then qualitative selection of the content of scientific publications (Figure 3).

Stating it as "a new trend that combines both quantitative and qualitative data in a single research project, in an effort to reconcile both methods", this analytical method simultaneously radiates in line with the productive results that define sustainability in business models (Antwi, et al., 2015: 217).

We formulate the opinion that currently the use of inductive and deductive reasoning is considered one of the most appreciated prospecting methods by researchers. This is because it allows them to highlight argumentative details that serve the improved sustainability of business models. Not only that, but it allows them to make constructive generalizations, thus providing valuable explanations for further research in the future.

The bibliographic research shows that the resource-based view (RBV) is an influential approach in the analysis of studies that correspond to the field of sustainable business models (Figure 4). We note that the resource-based view (RBV) provides a framework for developing organizational competence by effectively capitalizing on internal rather than external factors. This data analytics tool states that sustainable competitive advantage can be more easily achieved by exploiting external opportunities in combination with existing resources in a new way than by trying to acquire new capabilities for each different opportunity. This shows that the best approach is to analyze internal and external factors and combine both points of view to achieve and maintain a more sustainable organizational performance as well as a competitive advantage.

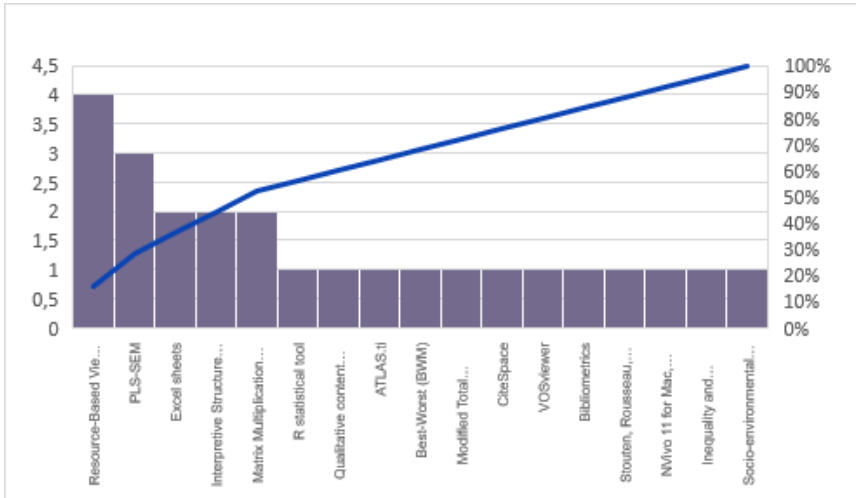


Figure 4: The weight of data analysis tools used in academic development publications

Source: Author's analysis, based on Scopus and Google Scholar Metrics

The realization of this bibliometric analyzes also affect an evaluation of the types of case studies used in the reviewed publications. The types of case studies were classified into 9 groups (Beltramello, et al., 2013: 32): "Waste recycling systems; Models based on greener products and processes; Optimizing efficiency through Information and Communications Technology (ICT); Systems based on alternative energy; Functional models of sales and management services; Industrial symbiosis; Green neighborhoods and cities; Innovative financing schemes; Sustainable mobility systems". Analyzing the field of entrepreneurial activity and the relevant categories for each original article or review type analysis examined in this bibliometric study, we find that they refer to one or a combination of overlapping categories, which we have presented in the graph below (Figure 5).

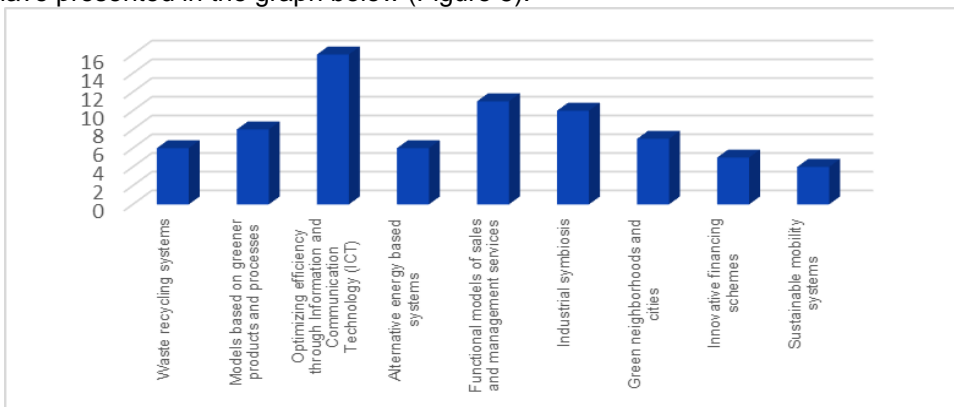


Figure 5: Application of case studies, analyzed by category

Source: Author's analysis, based on Scopus and Google Scholar Metrics

More digital and agile products/processes account for the largest share of case studies. We found that scholars are currently predominantly interested in the digital culture aspects of sustainable development. The analytics of building greener or multi-green-innovative business models is a growing interest. While most studies have focused on digital and technology considerations, very limited literature has focused on understanding the concept of environmental, ecological and social entrepreneurship. It is interesting to note that from the studies focused on digital innovation and technology development, a considerable number of academic studies impartially deal with important concepts for the development of sustainability of business models in accordance with the protection of the ecological system. Researchers deal with these concepts in a generic way, but without exploring all the components as a whole. The minimalist involvement of the specialized literature in the substantial treatment of the essence and dynamics of the development of socio-ecological sustainable business models best shows where the research attention for the business perspective needs to be paid. We conclude that actions taken to radically change the environment in which businesses operate through technology and digital often cause limitations in the development of socio-ecological systems of entrepreneurship. This approach prevents their expansion into more stable and sustainable trajectories. At the same time, this is due to the attention paid mainly to digital development, turning it into a mandatory principle for business development. By perceiving digital as the most important tool for business progress, the implications for the development of the ecological system are quite omitted. Also, the significant impact of technology on business behavior is the reason for excluding social considerations from decision-making processes in client-entrepreneur relationships. These literature analytic tools allow us to draw conclusions on a considerable number of scientific articles, thereby identifying current research trends and divergent ones to suggest future research directions.

6. Conclusions

- The study highlights the existence of gaps. This is due to the fact that the sustainability of business models has a wide scope of academic studies in the specialized literature, but not all aspects have been treated to the same extent to create new perspectives in the development of the sustainability of business models and outline a suitable landscape of possible areas of future research.
- The research showed that there is more than a conformist thinking in almost every scientific publication which allows the development of analytical strategies in the future, as well as the expansion of innovative areas that support the progress of business stability towards sustainability.
- Regarding the first research question, the study showed a significant relationship between sustainability and the philosophy of the resource-based perspective, since RBV is a strategic management approach that refers to explanations of the long-term success of companies based on resources. The natural environment in the RBV approach has challenged companies to review natural resources with their limits. This is the impetus for companies to generate more value and gain a stable development. But

at the same time, we suggest that companies should consider including green-innovation-initiatives as a means of achieving sustainable competitive advantage.

- The demarcation of the integration of induction and deduction of the digital has become increasingly appreciated in the field of entrepreneurial sustainability, somehow omitting the diffusion of social sciences that are particularly relevant for a better understanding of the behaviors and stance of business towards sustainability.
- Regarding the second research question, the intention of this work is to review the current scenario of SBM, to highlight application domains and to find emerging research areas. The academic approach that refers to the success and familiarity of sustainable business models in all fields of application is closely related to the ever-increasing use of technology and recently updated innovation. Some areas of application left in the shadow, which otherwise we can call tentative growth potential, in our opinion can ensure higher stability rather than entrepreneurial expectations and ambitions. It is worth noting the view that rigorous treatment of the subdominant trends that make up business models can ensure more focused sustainability than the macro-use of mega-trends. Among the trends treated in a minimalist way, we emphasize social responsibility, climate change, circular economy, energy transition, social justice, population dynamics, resource efficiency. This development will create the ability to generate new business models with more dynamic and robust perspectives in effectively establishing entrepreneurial comfort.
- The complex treatment of all the subfields that make up the business models serves as a carousel of maneuvers, whose action takes business models out of tension, bringing them to the zone of comfort, stability and sustainability.
- We note also that literature reviews should more widely address probability sampling for a number of benefits that enable a more qualified study setting. In turn, these benefits are articulated through the production of deductive reasoning when the population is usually diverse, which somehow does not allow the one-sidedness of the conclusions to be challenged.
- On sustainable business models, in the future we propose to do a case study on the evolution of the production activity system from eco-design and the effective implementation of eco-innovative practices.

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