



Circular Economy and Business Transformation in European Furniture Industry

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Abstract

In today's global landscape, industries must develop solutions to address environmental challenges, particularly emphasizing sustainable practices. The furniture industry, a significant contributor to resource depletion and environmental impact, requires immediate attention in this regard. This research focuses on exploring and establishing a framework for Circular Economy (CE) Business Models specifically designed for the furniture sector. By bridging existing research gaps, this study aims to support the adoption of sustainable Business Models aligning with EU Sustainable Development Goals (SDGs). The focus of this research is on the Sustainable Manufacturing and Eco Design Business Models. Given the limited literature available, this study seeks to enrich general understanding and provide practical insights to companies aiming to adopt more sustainable Business Models. To achieve this objective, a thorough literature review has been conducted. After initial literature review, we identified nine crucial value sources that served as the building blocks for a variable modeling framework designed for furniture industry Business Models. Transitioning from the literature review to an empirical analysis, secondary data used for quantitative desk analysis. As a result of this research, two archetypes have been identified specifically for furniture companies. These archetypes offer practical pathways for businesses aiming to transition towards sustainability. This paper contributes by providing a practical roadmap for furniture businesses to embrace CBMs. By offering validated archetypes and actionable insights, it aims to empower companies to align their strategies with sustainable practices.

Keywords: Circular Economy, Furniture industry, SDGs, Circular Business Models.

1. Introduction

In today's global landscape, industries must develop solutions to address environmental challenges, particularly emphasizing sustainable practices. The furniture industry, a significant contributor to resource depletion and environmental impact, requires immediate attention in this regard. This research focuses on exploring and establishing a framework for Circular Economy (CE) Business Models specifically designed for the furniture sector. By bridging existing research gaps, this study aims to support the adoption of sustainable Business Models aligning with EU Sustainable Development Goals (SDGs).

This research aims to address this gap by exploring possible Business Model archetypes in the furniture industry. In particular, this study allowed to locate seven different archetypes of Circular Business Models (CBMs) in the furniture industry, and the focus of this paper is on the Sustainable Manufacturing and Eco Design Business Models. This requires integrating efficient Sustainable Manufacturing and Eco Design practices into the operational framework of furniture businesses. Given the limited literature available, this study seeks to enrich general understanding and provide practical insights to companies aiming to adopt more sustainable Business Models. To achieve this objective, a thorough literature review has been conducted.

After initial literature review, we identified nine crucial value sources that served as the building blocks for a variable modeling framework designed for furniture industry Business Models. Transitioning from the literature review to an empirical analysis, secondary data from 4320 European furniture companies have been obtained from “CrunchBase.com” used for quantitative desk analysis. This process assessed their existing Business Models and their alignment with CE principles. The collected data have consequently been organized and analyzed using STATA software, employing statistical techniques such as Principal Component Analysis and Multivariate Regression Analysis among other statistical methods.

As a result of this research, seven distinct archetypes of CBMs have been identified specifically for furniture companies. These archetypes, based on the identified value sources, offer practical pathways for businesses aiming to transition towards sustainability. The research includes case studies that validate the effectiveness of these archetypes, showcasing successful implementation by some companies.

2. Literature Review

2.1. Circular Economy

The term CE was initially introduced by Stahel (1982) describing it as a self-replenishing system that minimizes material and energy input while preventing negative environmental impacts, without impeding growth and progress. There are several definitions for CE introduced by scholars during the several years: Bocken et al. (2016) defined CE as a Business Model that necessitates a shift in thinking and conducting business operations. Morsetto(2020) defined CE as “an economic model aimed at the efficient use of resources through waste minimization, long-term value retention, reduction of primary resources, and closed loops of products, product parts, and materials within the boundaries of environmental protection and socioeconomic benefits”. Kirchherr et al. (2017) after reviewing 114 CE definitions define CE as “an economic system that is based on Business Models which replace the ‘end of life’ concept with reducing, alternately reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies and consumers), meso level (eco-industrial parks) and macro level (city, region, national and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity, and social equity, to the benefit of current and future generations”.

In the literature, various perspectives highlight the positive impacts of a CE across different dimensions. One significant aspect of its positive influence is the potential to foster sustainability.

2.2. Industry 4.0 and Advanced Technologies

The advent of technological innovation and digitalization holds significant promise for facilitating the transition towards a CE, and for enhancing the efficacy of product lifecycle management across supply chains (Kumar et al., 2020). Numerous studies have found that leveraging Industry 4.0 (I4.0) technologies can effectively support and accelerate the adoption of CE practises (Chauhan et al., 2022; Kurniawan et al., 2022). It is widely acknowledged that digital transformation plays a critical role as one of the primary catalysts in the transition to CE principles (George and Schillebeeckx, 2022; Neri et al., 2023). Several papers highlight the significance of establishing a robust connection between CE and I4.0 technologies, as it serves as a fundamental key for organizations in their transformative journey towards embracing CE principles (de Man and Strandhagen, 2017; de Sousa Jabbour et al., 2018; Stock and Seliger, 2016). Chauhan et al. (2022) has tried to find the barriers and enablers toward *digitalization-led* CE and encourage scholars to investigate in how organizations can pass these barriers and transform their businesses into a circular one. According to De Jesus & Mendonça(2018) the deployment of technology is required for the CE to be widely adopted, and the connection between CE and I4.0 involves a re-evaluation of company processes across the value chain. Several scholars investigate the new technologies that can help organizations to move toward circularity and contributed to the literature. According to Bekrar et al. (2021) and Mastos et al. (2021), Cybersecurity and Blockchain have emerged as notable areas of interest in the context of the circular transition. This is primarily because these technologies possess the capability to ensure transparency and safeguard the cyber environment. A recent case study by Khan et al. (2020) found that dynamic capabilities are critical in CE implementation. Organizations aiming to transform their businesses towards a CE must prioritize acquiring a comprehensive understanding of how, when, and through which processes to identify, comprehend, and implement I4.0 technologies. This knowledge is essential to effectively navigate the integration of new technologies into their operations in alignment with CE principles.

2.3. Furniture Industry

The furniture industry in the European Union (EU) is a significant sector that plays an essential role in the economy, generating revenue and employment opportunities. According to the EU Commission Report on Furniture Trends, the furniture manufacturing sector in EU accounted for 27% of the world's total exports in 2010, with a total value of \$66 billion (Agyeman et al., 2023). According to the statistics provided by the EU Federation of Furniture Manufacturers (UEA), discarded furniture within the EU contributes to over 4% of the overall municipal solid waste (MSW) stream. It is estimated that waste originating from commercial sources accounts for approximately 18% of the total furniture waste generated in the sector. Annually, the total furniture waste in the EU amounts to 10.78 million tons. The furniture industry in EU is a fast-growing sector that contributes to the economy through revenue generation and employment opportunities. Overall, the EU furniture industry continues to demonstrate resilience and innovation, making significant contributions to the global market. However, despite its economic importance, the furniture industry also has significant environmental impacts, including resource depletion and waste production.

The adoption of a CE model presents a promising avenue to enhance value within the sector, concurrently addressing challenges associated with resource constraints, consumer preferences, and profitability. However, effecting the transition from a linear to a circular paradigm necessitates substantive alterations across micro, meso, and macro levels of operation. This transition encompasses multifaceted changes, spanning from innovating

Business Models and reconfiguring value chains to the enactment of comprehensive policy frameworks that provide requisite support and guidance (Hartini et al., 2022).

2.4. Circular Business Models, Definitions, Drivers and barriers

Various definitions of CBMs have been discussed in the literature. Separate literature reviews conducted by Geissdoerfer et al. (2020) and Rosa et al. (2019) indicate that CBMs can be defined in different ways. Some definitions emphasize the importance of resource efficiency and the value chain. In these definitions, a CBM refers to how a company creates, captures, and delivers value by focusing on enhancing resource efficiency through strategies such as extending the useful life of products and parts, durable design, repair, remanufacturing, and closing material loops. Another group of definitions identified by Geissdoerfer et al. (2020), highlights the association of CBMs with the concept of the CE. These definitions emphasize that the role of a Business Model is to integrate CE principles into business activities and partnerships, establishing a cost and revenue structure that aligns with both sustainability and profitability. A third group of definitions, discussed by Henry et al. (2021) and Rosa et al. (2019), revolve around the competitive advantage that CBMs can provide to companies. These definitions state that circular and sharing Business Models enable companies to enhance the sustainability of their practices and create a competitive edge within and beyond organizational boundaries.

The Business Model of a company is crucial for its success and sustainability in the market (Frishammar and Parida, 2018). It encompasses the various elements that determine how a company creates, delivers, and captures value (Wang et al., 2015). One perspective on Business Models is that they consist of three essential elements necessary for a firm to operate: benefits or values for customers and business partners, revenue sources, and logistics arrangements (Witek-Hajduk and Zaborek, 2016). To effectively design a Business Model, it is important to consider both the backend and frontend elements (Teece, 2018). The front-end elements of a Business Model include the value proposition, which defines the unique value that the company offers to its customers (Witek-Hajduk & Zaborek, 2016). Furthermore, the front-end elements include key activities, which are the core processes and activities that the company performs to create and deliver its value proposition (Witek-Hajduk & Zaborek, 2016). On the other hand, the back-end elements of a Business Model include key resources, which are the physical, intellectual, and human resources that the company utilizes to execute its key activities and deliver its value proposition (Klein et al., 2017), and the distribution and communication channels that the company uses to reach its customers and deliver its value proposition (Ghezzi, 2012). Moreover, the backend elements include customer relationship, which refers to the way the company interacts and maintains relationships with its customers in order to ensure customer satisfaction and loyalty (Witek-Hajduk and Zaborek, 2016). Additionally, the backend elements of a Business Model include cost structure, which refers to the costs incurred by the company to operate and deliver its value proposition (Execution Models, 2004). The concept of Business Models and its components has been extensively explored in the literature. To address the growing interest in CBMs, researchers have started exploring the key elements and dynamics of such models (Witek-Hajduk and Zaborek, 2016).

In conclusion, the barriers of transforming from a linear to a Circular Business Model include insufficient resources, limited awareness, regulatory complexities, supply chain issues, organizational resistance, market demand constraints, and lack of collaboration among stakeholders. Sarja et al. (2021) emphasize the struggle businesses face in understanding the potential of CBMs, leading to uncertainties in business decisions and long-term objectives.

3. Data Collection and Methodology

To better understand the current situation of CE in furniture industry, this research started from a systematic literature review. According to the results of the Literature Review, researchers identified 9 value sources that seem to promote CE strategies in furniture industry. These value sources are shown in Table 1.

Table 1: Defining value sources into variables

Defined Variable	Value Sources
SouVal_1	Retaining the Product Ownership (RPO) and selling a service
SouVal_2	Adding services that reduce the product consumption
SouVal_3	Designing superior product based on Product Life Extension
SouVal_4	Designing product for easy recycling (Design for Recycling)
SouVal_5	Designing different/superior eco-products using environmentally friendly materials
SouVal_6	Reducing product/service price through supply chain integration such as Industrial Symbiosis
SouVal_7	Reducing product/service price through environmental manufacturing processes (sustainable manufacturing)
SouVal_8	Reducing product/service price thanks to the use of recycled materials
SouVal_9	Promoting technologies for supply chain integration that favors CE

Source: Authors

By using the identified value sources, the components of the Business Model have been structured, encompassing business type (B2B or B2C), customer segment, customer relationship, revenue model, key resources, activities, and partners/suppliers. These components were systematically organized within an Excel file. Subsequently, secondary data have been obtained from the Crunchbase website, presenting information on 4320 furniture businesses in the EU. After excluding companies that did not initiate any CE practices or any effort for sustainability based on the information on their website and irrelevant companies or those that were shut down and unaccusable, the dataset has been refined to encompass 936 companies. A subsequent desk analysis has been conducted to examine the Business Models of each company. The findings from this analysis have been compiled into an Excel file, facilitating quantitative examination. The STATA software, version 17.0, has been used to conduct the quantitative analysis and find the relationship between dependent variables (Business Model sections) and independent variables (value sources). This desk analysis allowed us to gain a comprehensive understanding of the current state of the furniture industry in the EU and its approach to the CE. The focus has been on key cycles, such as maintenance, repair, reuse, refurbishment, re-purposing, and recycling, as highlighted by Petrache in 2019. By systematically exploring these aspects, valuable insights have been obtained about how companies in the EU perceive and integrate CE principles into their operations.

To identify patterns and relationships among variables in a dataset, two widely used techniques have been adopted, i.e. Principle Component Analysis (PCA) and Multivariate Regression. PCA is a dimensionality reduction technique commonly applied in data analysis. It allows us to identify the most important variables in a dataset by reducing the original set of variables

into a smaller set of uncorrelated variables known as principal components. These principal components capture the majority of the variance in the dataset and can be used to understand the underlying patterns or structure. Multivariate Regression, on the other hand, is a statistical modeling technique used to predict or explain the relationship between a dependent variable and multiple independent variables. Using Multivariate Regression, it was possible to determine the significance of specific parameters among datasets and assess the impact of independent variables on the dependent variable. By combining PCA and Multivariate Regression, a comprehensive understanding of the patterns and relationships within a dataset have been obtained. This combined approach allows the identification of important variables through PCA and the exploration of how these variables contribute to the dependent variable through Multivariate Regression. This helps to overcome the issue of multicollinearity, where independent variables in a regression model are highly correlated with each other, leading to unreliable interpretations of their importance.

4. Data Analysis

By employing PCA, the value sources from 9 to 7 have been narrowed down. The two excluded sources have been integrated with other variables that showed notable correlations with them.

Value source 1 and value source 2 have been merged based on component 2, as the eigenvectors of component 2 exceeded the threshold of 0.5, which was deemed significant. Also, value source 7 and value source 9 have been merged together based on component 6. These combinations created the combined value sources namely: CombinedSouVal_12 and CombinedSouVal_79, which have been then defined into the dataset for Multivariate Regression. Following the Multivariate Regression analysis, variables with positive and negative coefficients that exhibited a P-value below the defined threshold of 0.1 have been filtered. This threshold is considered significant, considering the economics and dynamics inherent in the dataset. Through the detailed methods outlined, the value sources and Business Model sections have been refined to identify patterns based on coefficients. Following the Multivariate Regression analysis, a total of 7 archetypes based on value sources have been identified. For this research, the focus has been on 2 of these archetypes to be explained in detail and the Business Model relating to these archetypes has been depicted into Canvas Business Models to have a better understanding of the archetypes. The Canvas Business Model, introduced by Osterwalder and Pigneur, is a widely used tool for strategic business planning. As discussed in literature review, Business Models consist of nine key elements, and this helps in visualizing and innovating them. Customer Segments and Value Propositions outline the target audience and the unique value offered, while Channels details the methods of delivering this value. Customer Relationships focuses on interaction, Revenue Streams on income generation, and Key Resources on critical assets. Key Activities encompasses essential tasks, and Key Partnerships involves external collaborations. The model provides a holistic view, aiding businesses in optimizing their strategies and operations (Osterwalder and Pigneur, 2010; Johnson et al., 2008; Blank and Dorf, 2012). These visualized archetypes can fulfill the aim of this research and conceptualization of CBMs in the furniture industry.

5. Results

The delineated archetypes comprise a set of seven specific strategies that provide guidance for furniture companies embarking on the journey towards CE. These strategies not only outline the essential steps but also emphasize the requisite changes in their Business Models.

This strategic framework is designed to ensure a more streamlined and efficient transformation process, allowing companies to navigate the complexities associated with embracing circular principles in the furniture industry.

The modeling and coding process of variables are shown in Table 2.

Table2: Variable modeling and coding

Variable	Definition
CSB2C 1	Mass market one to all
CSB2C 2	Mass Market customized: one to one
CSB2C 3	Niche market
CSB2B 1	Retailer or partners
CSB2B 2	Another actor not selling to customer
CR 2	Customer communities
CR 3	Product/service configuration
CR 4	Customer relations IT tools
Chan 1	Own brand
Chan 2	Own physical channels (shops)
Chan 3	Own web-site channels
Chan 4	Not own channels, wholesalers
Chan 5	Other channels (partners/retailers)
Chan 6	After sales services
RevMod 1	Asset sale
RevMod 2	Subscription fees
RevMod 3	Commissions
RevMod 4	Advertising
ResActPart_1	Are there agreements with suppliers for circularity?
ResActPart_2	Are there agreements with customers for circularity?
ResActPart_3	Are there agreements with other kind of partners for circularity?
ResActPart_4	Is the company involved in eco-activity?
ResActPart_5	Does the company possess patents or new technology that are environmental performant?

Source: Authors

Throughout the analysis, the results of the Multivariate Regression show the correlations between each business model section and the seven identified archetypes will be elucidated. Based on this analysis, seven archetypes have been created to guide companies in shifting towards CBMs in the furniture industry. Each archetype is built around key value sources, providing practical insights to make the transformation process smoother. These archetypes not only help companies overcome challenges, but also offer actionable steps to cut costs and streamline the entire process. In simple terms, they serve as practical roadmaps, empowering companies to understand and navigate the transformation process effectively. However, for the purpose of this research we will only focus on two main archetypes,

5.1. Archetype 1

This archetype is based on combined value sources 7 and 9 (CombinedSouVal_79) which is “Sustainable Manufacturing”. In the Multivariate Regression analysis, examining the relationship between B2B and various value sources, CombinedSouVal_79 emerges as a significant predictor for B2B within the specified model.

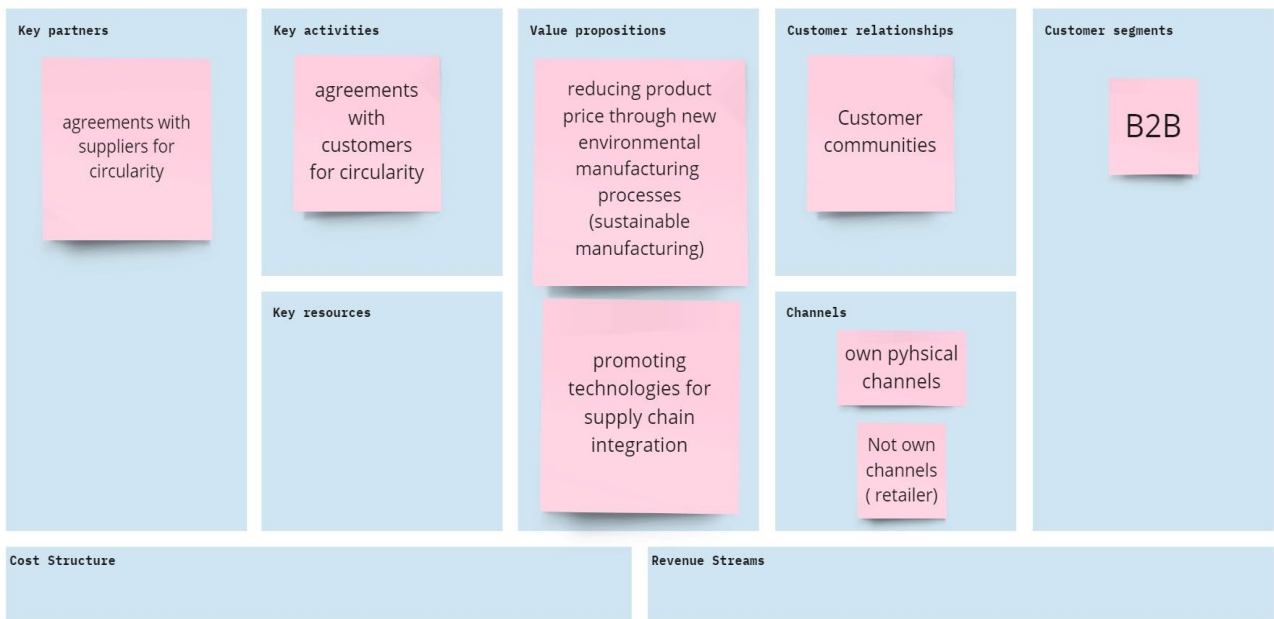
The coefficient of 0.1555546 indicates that a one-unit increase in CombinedSouVal_79 is associated with a 0.1555546 unit increase in B2B. This relationship is statistically significant,

supported by a t-statistic of 2.60 and a p-value of 0.009, signifying its robustness at the 0.1 significance level. The coefficient for CombinedSouVal_79 is 0.1545889, suggesting that a one-unit increase in CombinedSouVal_79 is associated with a 0.1545889 unit increase in CSB2B_1. This relationship is statistically significant, as evidenced by a t-statistic of 2.75 and a p-value of 0.006, affirming its robustness at the 0.05 significance level. The Regression results for CR_2 and CombinedSouVal_79 indicates a significant relationship.

The positive impact of CombinedSouVal_79 on both channels underscores the relevance of sustainable and combined values in shaping customer relationships and business dynamics within the B2B context. This insight can inform strategic decisions in customer relationship management, emphasizing the importance of sustainability values in fostering positive interactions and alignment with the overarching business archetype. The relationship between ResActPart_1 and ResActPart_2 with CombinedSouVal_79 is evident in the provided Regression coefficients. For ResActPart_1, CombinedSouVal_79 exhibits a positive coefficient of 0.1279132, indicating a statistically significant positive association between the activities represented by ResActPart_1 and the archetype represented by CombinedSouVal_79. For ResActPart_2, CombinedSouVal_79 shows a positive coefficient of 0.0631095, suggesting a positive association. These coefficients imply that ResActPart_1 has a more pronounced and statistically significant impact on CombinedSouVal_79 compared to ResActPart_2. Interpreting the results, the focus of this research led to archetype 1. Subsequently, the various sections of the CBM relating to this archetype have been consolidated and developed its corresponding Canvas model in Figure 1.

Figure 1: Archetype 1

The Business Model Canvas - Sustainable Manufacturing



The Multivariate Regression analysis reveals a coherent pattern among B2B, CSB2B_1, Chan_3, Chan_4, ResActPart_1, and ResActPart_2, all converging with CombinedSouVal_79. This archetype signifies a strategic focus on sustainable manufacturing, aligning with CE principles, and aiming to reduce product/service prices. The positive relationships between these variables indicate sustainable manufacturing practices, are associated with improvements in B2B transactions, customer satisfaction, and various responsive actions.

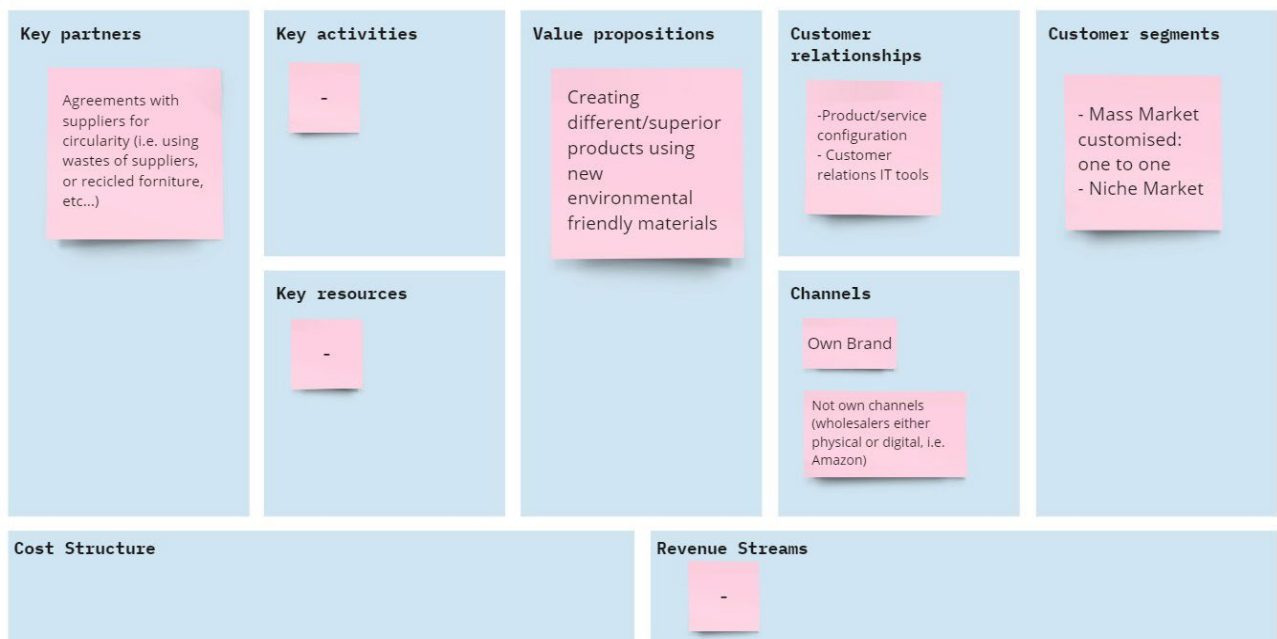
5.2. Archetype 2

This archetype is based on value source 5 which is “Eco Deign” or superior Eco-products. The Regression Analysis reveals a significant and positive relationship between B2C and SouVal_5. The coefficient of 0.0725818 indicates that a one-unit increase in SouVal_5 is associated with a 0.0725818 unit increase in B2C. This relationship is statistically significant at the 0.1 significance level, as supported by a t-statistic of 2.37 and a p-value of 0.018. In practical terms, the results suggest that higher values of SouVal_5, reflecting specific sustainability considerations, have a meaningful impact on the extent of business-to-customer transactions. This insight underscores the importance of incorporating sustainability values, particularly SouVal_5, in strategies aimed at enhancing and understanding customer engagement within the business-to-customer (B2C) framework. The Regression analysis unveils a strong and statistically significant relationship between CSB2C_2 and SouVal_5. This relationship is statistically significant with 0.1 threshold, supported by a t-statistic of 2.44 and a p-value of 0.015. The regression analysis reveals a strong, statistically significant relationship between CR_3 (customer retention) and SouVal_5. This shows positive correlation between eco-design and sustainable agreement with suppliers since the input of raw material is an important starting point for sustainable manufacturing.

As previously stated, by evaluating the data, the various elements of the CBM relevant to this archetype have been unified and their Canvas model has been shown in Figure 2.

Figure 2: Archetype 2

Business Model Canvas - Eco Design



6. Discussion

6.1. Archetype 1: Sustainable Manufacturing

Archetype 1, centered on "Sustainable Manufacturing," stands as an efficient Business Model for furniture companies seeking to integrate CE principles into their core operations. This archetype showcases a positive correlation with key segments of the Business Model, placing a strong emphasis on sustainable manufacturing processes.

Customer Segments: Tailored for B2B transactions, this archetype strategically targets business customers. By focusing on the B2B market, companies adopting this archetype align their strategies with industrial partners, placing a significant emphasis on sustainable manufacturing practices to meet the specific needs of business clients.

Customer Relationship: The incorporation of customer communities into the customer relationship strategy underscores the importance of fostering collaborative communities around sustainable manufacturing. This approach not only builds relationships with individual customers but also cultivates a broader network of businesses sharing common sustainability goals. This collaborative aspect contributes to a more profound and interconnected business ecosystem.

Channels: Employing a dual-channel approach, utilizing both own websites and external channels, companies adopting this archetype maintain a direct online presence while leveraging external channels to broaden their reach within the B2B market. This dual-channel strategy ensures flexibility and adaptability to diverse business environments.

Value Proposition: The value proposition centers around reducing product/service prices through the implementation of new environmental manufacturing processes. Beyond the immediate financial benefits, this approach also minimizes environmental impact, providing a compelling proposition for businesses seeking sustainable solutions in their supply chains. It underscores a commitment to cost-effectiveness without compromising ecological responsibility.

Key Partners and Key Activities: Integral to Archetype 1 are agreements with suppliers for circularity and agreements with customers for circularity. These agreements signify a comprehensive commitment to embedding sustainable manufacturing practices both in the sourcing of inputs and the end-use of products. The focus on circular principles extends to key partnerships and activities, emphasizing a holistic approach to sustainability.

In furniture industry, companies can leverage this archetype to transform their manufacturing processes towards a CE. The emphasis on sustainable manufacturing practices not only aligns with environmental responsibility but also serves as a catalyst for cost reduction. Specifically, the implementation of new environmental manufacturing processes can lower production costs and minimize environmental impact. This dual advantage empowers companies to not only contribute to CE goals but also strategically reduce product/service prices. The ability to offer more competitively priced, environmentally friendly products positions these businesses in for success in a market increasingly driven by sustainability considerations. Thus, embracing this archetype not only fosters environmental stewardship but also propels businesses towards CE objectives and economic competitiveness.

To validate the relevance of this archetype, a case study in the used database that aligns with this archetype by more than 70% have been identified. These case study serves as tangible evidence, confirming the practical application and impact of the identified archetype in real-world business scenarios.

6.1.1. Case study: Profil-Nabytek

Profil-Nabytek is a dedicated furniture manufacturer offering high-quality, environmentally friendly products designed for longevity. Their commitment to sustainability goes beyond being a project or corporate goal: it is a pervasive business approach ingrained in every aspect, thanks to a close partnership with the CE platform circu.eu. The case study of Profil-Nabytek serves as a tangible application of Archetype 1. This in-depth exploration illustrates how the

company strategically embraces sustainable manufacturing principles to redefine its position and Business Model within the furniture industry. Operating in a niche B2C market, Profil-Nabytek establishes personalized customer relationships through dedicated personal assistance, both online and in physical showrooms. The company's key value propositions revolve around supply chain elimination, minimizing transportation, optimizing costs, and ultimately reducing prices for customers. Profil-Nabytek's commitment to sustainability is evident in the use of recyclable and ecological materials, aligning with the eco-conscious preferences of its niche market. Key activities undertaken by Profil-Nabytek include innovative approaches like product return options, furniture rental services, and practical upcycling initiatives. These activities contribute to the CE narrative by extending the lifespan of furniture and minimizing waste generation. Profil-Nabytek's key resources stem from long-term partnerships with suppliers providing recyclable raw materials, ensuring a steady and sustainable supply chain. Collaborations with a CE platform further emphasize the importance of key partnerships in embedding sustainability throughout the value chain. Profil-Nabytek's case perfectly aligns with the principles of Archetype 1. Its focus on B2C transactions and personalized customer relationships reflects the archetype's emphasis on efficiency in consumer-facing operations. Profil-Nabytek's transformative journey demonstrates the potential impact of Archetype 1 within the furniture industry. By understanding the positive correlations within the Business Model sections, companies can tailor their strategies to effectively implement sustainable manufacturing practices. This archetype not only aligns with evolving consumer preferences but also positions companies as pioneers in the transition towards a CE.

6.2. Archetype 2

Archetype 2, revolving around "Eco Design," emerges as a forward-thinking Business Model for furniture companies seeking to integrate CE practices. This archetype exhibits a positive correlation across various dimensions of the Business Model, signaling a comprehensive and sustainable approach to furniture manufacturing. Customer Segments: Archetype 2 strategically caters to a diverse customer base, including B2C mass market one-to-one and niche market segments. By addressing both broad mass market needs and the specific requirements of niche markets, companies adopting this archetype ensure a diversified customer base. Value Proposition: At its core, Archetype 2 focuses on creating distinctive and superior products using novel environmentally friendly materials. The value proposition emphasizes innovation and sustainability, meeting the demands of environmentally conscious consumers seeking cutting-edge design and ecological integrity.

In the context of CE, this archetype provides a roadmap for furniture companies to transition towards more sustainable and circular practices. By adopting eco design principles, these companies can contribute to reducing environmental impact, minimizing waste, and fostering a more circular approach to product lifecycles. This comprehensive approach integrates sustainability into various facets of the business, from product development and marketing to supply chain management, offering a holistic strategy for furniture companies to thrive in a circular and environmental conscious market.

6.2.1. Case study: Rozière

Rozière, a French manufacturer specializing in interior doors and cupboards, stands out for its commitment to the values of industrial craftsmanship.

Rozière, a prominent player in the furniture industry, has strategically positioned itself within the eco-design archetype, catering to both B2B and B2C mass market segments. The company's

unique business model revolves around eco-design principles, emphasizing high-quality products derived from sustainable forests and a responsible use of raw materials. Rozière's commitment to sustainability is evident in its customer relationships, offering personalized or standard products alongside automated services. Key activities within Rozière include substantial investments in research and development, ensuring that its manufacturing processes are not only innovative but also sustainable, with a dedicated focus on waste reduction. The company has strategically formed partnerships with designers and sustainable suppliers, aligning with its commitment to eco-friendly practices. This case study highlights Rozière as a successful exemplar of the eco-design archetype, offering valuable insights for other furniture companies aiming to adopt similar Business Models with a focus on sustainability. The company's commitment to sustainable practices, from environmentally friendly sourcing to customer-centric product offerings, positions Rozière as an industry leader in meeting evolving consumer expectations and industry-wide sustainability goals. Rozière's multi-channel approach, combining an online platform with physical showrooms, caters to a diverse clientele, aligning with the eco-design archetype's emphasis on creating products with broad appeal. By collaborating with like-minded entities, Rozière demonstrates how strategic alliances can amplify the positive impact of sustainable practices within the broader business ecosystem.

7. Conclusion

This research has investigated the dynamic landscape of CBMs within the furniture industry, aiming to explore various archetypes to facilitate the transformation process of business toward CE. Through the utilization of Multivariate Regression Analysis, seven archetypes have been identified, with a detailed examination focused on two specific ones. The interpretation of results led to the development of understanding of the different Business Model sections and their unique features in furniture industry.

Within the furniture sector, while the conventional value proposition primarily aims to offer access to high-quality, functional design furniture, there exists an additional ethical dimension inherent in the product. This ethical dimension is reflected in a robust responsible and sustainable culture, which complements the functional and aesthetic dimensions typically emphasized in the industry. Consequently, circular furniture manufacturers must cultivate expertise and competencies linked to the sustainable value associated with their offerings while meeting customer needs through features like product customization and uniqueness. Product customization stands as a prominent characteristic within the circular value proposition of the furniture industry. Alongside customization, product uniqueness is a prevalent aspect in circular furniture value propositions. Additionally, associated services often form part of the value proposition. Beyond merely selling furniture, circular furniture companies frequently leverage their expertise in sustainability and circularity as an added value to connect with customers seeking to enhance their sustainability impact.

While previous studies emphasize the significance of clean technologies in facilitating the shift toward sustainable Business Models, technological advancements are frequently overlooked as primary resources essential for producing circular furniture. Contrarily, managing reclaimed wood predominantly involves manual labor to restore the wood to its original condition. However, ensuring a successful transition necessitates staff awareness regarding limitations and a proactive pursuit of new knowledge. Typically, this pursuit occurs through trial-and-error processes, which are more time-consuming compared to working with stable supplies.

By emphasizing the importance of value sources and their impact on sustainable practices, this research sheds light on the key factors that drive circularity within the industry. The

identification and validation of these archetypes provide valuable insights for furniture companies seeking to embrace CE principles and transform their traditional linear Business Models. Furthermore, this research highlights the potential for collaboration between different stakeholders in achieving circularity, as well as the need for a system thinking approach to address complex sustainability challenges. Drawing on extensive data collected through secondary sources, this paper has provided a comprehensive analysis of CBMs in the furniture industry. The findings suggest that companies offering solutions aligned with CE principles should consider understanding green consumption motives and behaviors to adapt their value proposition accordingly. This research also highlights the importance of designing products for durability, repairability, and recyclability, as well as establishing effective reverse logistics systems to facilitate the recovery and reintegration of materials. Overall, this paper contributes to the growing body of knowledge on CBMs and their applicability in the furniture industry. The adoption of CBMs presents opportunities for companies not only to drive sustainability but also to innovate and differentiate themselves in the market. With a focus on collaboration, systems thinking, and understanding consumer behaviors, furniture companies can pave the way for a more sustainable and circular future.

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