
Circular Economy Business Models Addressing Social Acceptance

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Abstract

The overall aim of this paper is to develop a new conceptual framework for business model innovation in a circular economy and to explore the social acceptance of business models in this context. Social acceptance of products or services is an important factor when developing new circular economy business models. An analysis of circular economy business (CEB) models is made. Interviews and a survey questionnaire on social acceptance, integrated to circular economy business model canvas development in three value chains is designed. Analysis of social acceptance studies produces a study method on how social acceptance is linked to business development, an approach which can be tested and used in the present project. Understanding of the social acceptance process and factors of emerging CE business models and their limitations will help us to design better products, services and business models.

Keywords:

Circular Economy, Business Models, Value chains, Social Acceptance, Systematic process, co-creation, sustainable development

Introduction

New protein and fertilizer sources are needed in Europe, and new business concepts are under development. Valuwaste project (valuwaste.eu) proposes an integrated approach in urban biowaste upcycling for the production of high-value bio-based products, developing both technologically and socially sustainable solutions adapted to the different socio-economic contexts. The project is coordinated by CETENMA (Centro Tecnológico de la Energía y Medio Ambiente) and has been granted funding by the European Commission, under the “Societal Challenge 2” programme. This study aims to contribute to green circular economy business models development and acceptance process.

The sustainable society in the sense of social justice is now questioned (Moula et al., 2018). The sustainable development has been challenged by the global challenges, climate crisis, raw material scarcity crisis, toxicity crisis, energy crisis, etc.. We can tackle these challenges by timely steps, and the Green Circular Economy can be seen as such a step (Moula et al., 2018). Also the European Commission has adopted a new Circular Economy Action Plan, Europe's new agenda for sustainable growth, with measures along the entire life cycle of products. Changing how we produce and consume shows the way to a climate-neutral, competitive economy of empowered consumers. In line with the Sustainable Development Goals (SDGs), the Commission will propose a target on food waste reduction addressing comprehensively the food value chain, and sustainability of food distribution and consumption (EU, 2020).

Circular economy provides many opportunities for companies, customers and the society. Circular economy business models (CEBs) are under development. However, we lack empirical research focusing on the social acceptance of the circular economy business models, and the systematic process towards CEB. We lack knowledge on the consumer willingness to adopt new technologies, products and services. Circular economy strategies should include an assessment of the consumers' willingness to engage in and accept different

innovation pathways and include all actors of supply chain (Borrello et al., 2016).

The study is made by analysing CE business models, and by developing and applying a methodology to study social acceptance in the valorization process of products or services. We study social acceptance integrated to the CE business models. We recognize the importance of fundamental values (Keeney, 1992) when identifying decision opportunities and the creation of better alternatives. The intent is to be proactive and to select better decisions to ponder before attempting any solutions.

Current understanding on circular economy business models

A business model describes the rationale of how an organization creates, delivers, and captures value, in economic, social, cultural or other contexts. The importance of the context where a business model is established is crucial for understanding the overall logic of the company, the design and creation processes, and the company interconnectedness with other entities (Kajanus et al., 2019). A business model can be defined as “a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams.” (Osterwalder et al., 2005).

Business Model Canvas (Osterwalder et al., 2005, Osterwalder & Pigneur 2010) is a strategic management and lean start-up template for developing new or documenting existing business models. It is a visual chart with elements describing a firm's or product's value proposition, infrastructure, customers, and revenue logic, consists of nine interrelated building blocks. Kajanus et al. (2014) has introduced an expanded BMC that adds three building blocks to the original canvas, namely, customer needs, the solution provided and the competition. Kajanus et al. also presented a procedure to analytically evaluate the business model items that represent each building block. The expanded BMC and the procedure helps when considering all the relevant aspects when designing a business model. The expanded BMC includes twelve building blocks in four main areas: customers and competition, the offering, the infrastructure and the profit formula. The method enables co-creation and learning on the how the users could create and consume value in economic, social, cultural or other contexts as part of the business models.

Circular Economy (CE) is a new economic model that aims to reduce and eventually close the resource loop, enabling resources to be used as many times as possible and allowing sustainable and carbon-free economies to thrive globally (Ellen MacArthur Foundation, 2013; European Commission, 2016, 2020). Previous research on business models has addressed the need for novel business models within the CE context. However, the topic is understudied and real-life cases have not been extensively addressed (Antikainen and Valkokari, 2016), and the CBMs differ from the traditional linear economic model. The linear economic model lacks sustainability, and it will be replaced by a novel CE models in which the focus is to keep materials in use for as long as possible and so to preserve – or even upgrade – their value through services and smart solutions. CE models require interaction between all involved actors, including both the core-business network and other stakeholders (Antikainen & Valkokari, 2016).

Circular-economy business models fall in two groups: those that foster reuse

and extend service life through repair, remanufacture, upgrades and retrofits; and those that turn old goods into as-new resources by recycling the materials. The model is people -centric. Ownership gives way to stewardship; consumers become users and creators (Stahel, 2015).

The key component in a CBM is the value proposition. (Piispanen et al., in press, Planing, 2015). Value creation is an opportunity on environmental and societal levels. Although the CBM must be viable and profitable, it contains more green values that can create value within a broader context (Piispanen et al., In press). Value creation can happen, for example, at the customer base, subcontractors, and distribution and logistics partners, meaning value opportunities throughout the entire supply and value chain, and also, the new information can be used by managers planning their businesses (Piispanen et al., In press). The value proposition can be virtual or the delivery can be virtual (Lewandowski, 2016). Additionally, selling the value proposition can take place through virtual channels as well as through interaction with customers (Ellen MacArthur Foundation, 2015). The CEBs have specific characteristics on the other business model elements as well, such as revenue streams, customer relationships, segments, key resources and partnerships (Lewandowski, 2016), and cost structure as an important benefit of CE (Piispanen et al., In press). The take-back system component shares the same core idea as material loops, which are central to the idea of CE (Ellen MacArthur Foundation, 2013). The adoption process of CEB is characterized by many internal and external factors (Piispanen et al., In press). For example, in the cases of Product service systems (PSS) and remanufacturing, their adoption has fallen short in the business-to-consumer sector, due to lack of consumer acceptance (Camacho et al. 2017). Literature addressing this issue has failed to provide a systematic approach to the problem (Camacho et al., 2017).

Research design

Business model canvas development

Business models process (Fig1, and 2) is a participative business model development process with multi-criteria evaluation/development system (MCDS) and portfolio analysis (Eskelinen et. al, 2017 and Kajanus et al., 2014, Kajanus et al., 2019). The expanded canvas framework with 12 BM blocks is used. The business model process (Fig. 1) starts with context definition, participant identification, and decision on the schedule and objectives. Business cases are identified in three value chains of circular economy (Fig 2), insect production from biowaste side-streams, single cell protein (SCP) from biomethane, and fertilizer production. The innovation pathway follows the ISO (56002) standard on innovation management: 1. Identification of opportunities, 2. Creation of potential concepts, 3. Validation of concepts, 4. Developing working solutions, 5. Deployment to realize value.

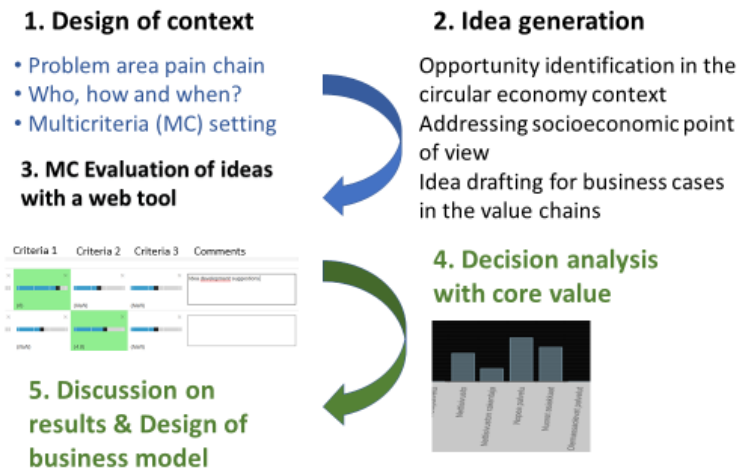


Fig 1. The CE business models process with MCDS (Kajanus et al., 2014, Eskelinen et al., 2017).

Opportunity identification (idea generation for the business model) with interviews and brainstorming of ideas to business model, is facilitated by using business model questions (Table 1). The questions are “traditional” business model questions boosted by questions related to circular economy, social acceptance, and sustainability. Business model ideas are validated in a multicriteria (MC) evaluation with online visual evaluation tool. Value-based evaluation criteria are used: social acceptance, sustainability, feasibility. Portfolio analysis (Kajanus et al., 2014, 2019) applying core index is used to find best idea portfolios to business models.

The results from the business model process are discussed in an interdisciplinary innovation team, where the elements of the business model are challenged by additional questions. For example, the value proposition or customer expectations can be challenged in the context of circular economy, sustainability, or social acceptance. The challenging and additional information to answer questions raised will be used to improve the model in an iterative process.

Interviews and a survey questionnaire are used to study social acceptance of business models (Fig 2). The business models are designed by using the information from the interviews by identifying new ideas to the business model in each business case. The insights are used when validating and challenging the business model.

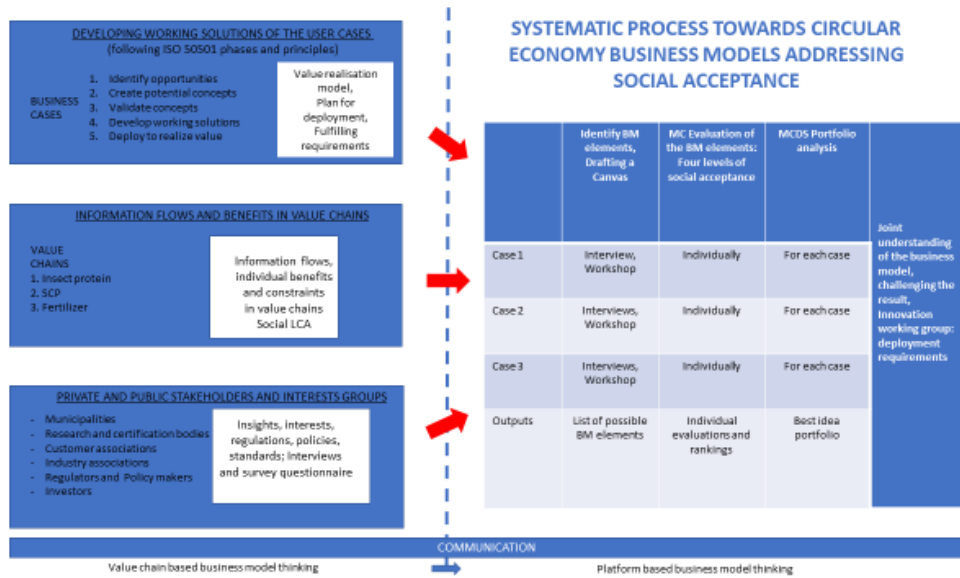


Fig 2. Systematic process towards circular economy business models addressing social acceptance.

Table 1. Business model questions

Customer competition	Offering	Resources
<p>1. Customer segments</p> <ul style="list-style-type: none"> • For whom we are offering solutions? Who are the target customers? <p>2. Customer needs</p> <ul style="list-style-type: none"> • Which are the end user/customer needs? Which are the sustainability and socio-economic aspects? <p>3. Company solution</p> <ul style="list-style-type: none"> • What different types of solutions are provided? How could you make them better. Is the solution sustainable and acceptable? <p>4. Competitors</p> <ul style="list-style-type: none"> • What competing solutions are available to the customer? 	<p>1. Value proposition</p> <ul style="list-style-type: none"> • What value added is provided and how? How social acceptance and sustainability are addressed in the value proposition? <p>2. Channels</p> <ul style="list-style-type: none"> • Which channels are used to deliver value added to the customer? <p>3. Customer relationships</p> <ul style="list-style-type: none"> • How the contacts to the customers are sustained? 	<p>1. Key resources</p> <ul style="list-style-type: none"> • Which resources are needed to build this business? How resources are used in the context of circular economy? Are the resources sustainable? <p>2. Key partners</p> <ul style="list-style-type: none"> • Who are the key players or partners that are needed? Describe the circular economy partnership. <p>3. Key activities</p> <ul style="list-style-type: none"> • Which measures are needed to build a business? <p>4. Cost structure</p> <ul style="list-style-type: none"> • Which costs should be included? <p>5. Income structure</p> <ul style="list-style-type: none"> • Financing

Social acceptance

The social acceptance study objective is to gain information and insights on, how the citizens (potential customers) perceptions are connected to CE business models development. How the awareness of citizens on sustainability, environment, benefits of new technologies and solutions, is linked to the acceptance of the new business models. How social acceptance is connected to business development, like market and customer needs, and how do the people view the acceptability of the new business models? Also, how do they value the tradeoff between economic and environmental considerations? In this study, the social acceptance concept is defined by distinguishing three dimensions of social acceptance, namely socio-political, community, and market acceptance (Wüstenhagen et al., 2007). Socio-political acceptance is social acceptance on the broadest, most general level. Factors influencing community acceptance, can highlight, for example, factors related to distributional justice (How are costs and benefits shared?), procedural justice (Is there a fair decision making process giving all stakeholders an opportunity to participate? (Gross, 2007, Wüstenhagen et al., 2007), or is the local community trusting the information and the intentions of the investors and actors from outside the community (Huijts et al., 2007, Wüstenhagen et al., 2007). Social acceptance can also be interpreted as market acceptance, or the process of market adoption of an innovation. According to the

theory of diffusion of innovation, the adoption of innovative products by consumers is explained through a communication process between individual adopters and their environment (Rogers, 1995). Thus, the social acceptance approach ensures public engagement in terms of their awareness, commitment and active participation that contribute for the achievements of public sector involvements in CE business models development .

To measure the public level of social acceptability of the three value chains which produce new biowaste valorizing products and services or technologies, we will apply a survey questionnaire for this study (Moula et al., 2017). We can include people from different ethnical backgrounds to enrich the sample space in order to make the research results more substantial, reliable and objective (Moula, 2012a). We will also use semi-structured interviews to study trends of social acceptance (Hai et al., 2018). Ethics committee approval and informed consent will be applied when interviewing stakeholders or using the survey questionnaire. The quantitative analysis will be made by summarizing all the data and calculating the percentage of the choices for each question. The content analysis provides us an avenue to understand the social reality in terms of public acceptance of products, services and technologies of the valorizing of biowaste.in a subjective but scientific manner (Moula, 2012b, Moula et al.,2018). The information will be used when designing business concepts, and value proposition (public view), in the business cases (Fig 2). A classification of social acceptance is needed, and it will be developed and used as part of the multi-criteria evaluation of business model with an online tool (Fig 1). We will learn from, and adapt, a four-level classification (withdrawal, acceptance, approval, psychological identification) (Thomson and Boutilier, 2011).

Social Life Cycle Assessment (S-LCA)

The Social Life Cycle Assessment (S-LCA) allows the identification of key social aspects, the assessment of social conditions, and the determination of the social impacts resulting from each studied business case (Fig 2). The S-LCA allows to know the social and socio-economic impacts of the production of those products on five main stakeholder's groups: workers/companies in charge of the biowaste product generation, local communities (waste sorting), final end-users and consumers and society in general. LCA of a reference case will be made available, including mapping and quantification of primary and secondary resource streams (water, energy and materials), and the socio-economic value creation.

Survey questionnaire on social acceptance

In this study, we will tackle the concept of social acceptance by addressing three dimensions of it: Which are the socio-economical, community and market acceptance aspects in three value-chains to develop products and services from biowaste.

Importance of the survey

By participating, the participants' values will influence industry practices and government policy and contribute to one of the most important project outcomes: guidelines for industry, government and communities on how to work together and ensure a more responsible biowaste management and their utilization as a sustainable resource.

Survey organisation

Part A includes general questions about the respondents' values using a social science method applying the Schwartz Scale. Peoples' life choices are guided by a certain set of values. The respondent will rank a set of values. Part B includes questions on the background and social-community-market perspective, and includes questions on the respondents' general perceptions and expectations of the value chains.

Expected results

We will co-create CE business models which will be validated against social acceptance, sustainability, and other relevant values for business development. Interviews and questionnaire, and also S-LCA analysis will produce information on the social acceptance of CEBs around the business cases in the three value chains. The methods will enable co-creation and learning on the how the users could create and consume value in economic, social and cultural contexts as part of the CEB development.

Conclusions

A framework to understand social acceptance integrated to circular economy business model development in three value chains is designed, and the approach will be implemented in a present project valorizing biowaste. Social acceptance is a crucial when designing value proposition to a CEB.

Contribution

The study contributes to circular economy business models development by applying systematic method and approach integrating systematic co-creative business model process, circular economy and social acceptance.

Practical implications:

Understanding of social acceptance and its limitations will help us to design better solutions and especially value proposition for circular economy business models.

Areas for feedback & development

Research design. Circular economy business modelling. Methodology of social acceptance.

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