

**Ministry of Higher Education and Scientific Research**

**Higher National School of Management**

**ENSM. University Pole of KOLÉA**



**Master's Thesis**

**Master in Entrepreneurship and Project  
Management**

**Business Model Innovation for Circular Economy**

**Case Study: Revade Solutions**

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**Academic Year, 2021**

## **Acknowledgements**

This report is the result of a degree project conducted at the National High School of Management in Kolea, fall 2021. Throughout the thesis, I have had the pleasure to work as operations manager at Revade Solutions, when I got to discover the world of circular economy.

I gratefully acknowledge my supervisors at ENSM, Dr Mehdi Bouchetara, and Walid Hadjadj at Revade Solutions for supporting me with ideas, suggestions, and recommendations during my work.

Big thanks to my colleagues at the school, Khaled Sadoun and Soumia Belabbas for your support, help and interest. Your input has been very valuable to me.

To my family, my mother and father, who through their sacrifices, support, guidance during the past 25 years, they made me what I am today and I really hope that I reached their expectations or I will someday. To my siblings, Ihab and Aimen, whom always looked at me as their role model and believed in my capacities.

To my life partner, Soror, the source of my power, the one that keeps supporting me towards achieving my goals, the one who I found next to me during my hard moments, Thank you for everything.

To all my friends, for their support.

October 2021

Fares Ala Eddine BOULAHIA

## **Abstract**

The aim of this research is to examine the topic of business model innovation in the circular economy, the study was held at Revade Solutions, the case study. The objective was to study how the case company could implement the circular business models in its actions.

The aim was to explore the key factors that help implement a circular economy in a company, research provides a practical tool for circular economy practices. The study outcomes show that within a company product design, research and innovation activities play a key role in creating a circular economy and highlighted the need to a new business model.

**Key words:** Business Model, Circular Economy, Innovation

## **Resumé**

Ce mémoire de maîtrise a examiné le sujet de l'innovation des modèles d'affaires dans l'économie circulaire, l'étude a été faite au niveau de Revade Solutions, l'étude de cas. L'objectif était d'étudier comment l'entreprise de cas pourrait mettre en œuvre les modèles d'affaires circulaires dans ses actions.

L'objectif était d'explorer les facteurs clés qui aident à mettre en œuvre une économie circulaire dans une entreprise. Enfin, la recherche fournit un outil pratique pour les pratiques d'économie circulaire. Les résultats de l'étude montrent qu'au sein d'une entreprise, les activités de conception de produits, de recherche et d'innovation jouent un rôle clé dans la création d'une économie circulaire et ont mis en évidence la nécessité d'un nouveau modèle commercial.

**Mots Clés :** Innovation, Economie Circulaire, Modèle d'Affaire

## المخلص

تناولت أطروحة الماجستير هذه موضوع ابتكار نموذج الأعمال في الاقتصاد الدائري، حيث تم إجراء الدراسة حول الشركة الناشئة Revade Solutions، دراسة الحالة. كان الهدف دراسة كيف يمكن لشركة الحالة تنفيذ نماذج الأعمال الدائرية في أعمالها.

كان الهدف هو استكشاف العوامل الرئيسية التي تساعد في تنفيذ الاقتصاد الدائري في الشركة. أخيرًا، يوفر البحث أداة عملية لممارسات الاقتصاد الدائري. كما تظهر نتائج الدراسة أنه في إطار تصميم منتج الشركة، تلعب أنشطة البحث والابتكار دورًا رئيسيًا في إنشاء اقتصاد دائري وتسلط الضوء على الحاجة إلى نموذج أعمال جديد.

**الكلمات المفتاحية:** الابتكار، الاقتصاد الدائري، نموذج الأعمال

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## **LIST OF SYMBOLS AND ABBREVIATIONS**

CE	Circular Economy
BM	Business Model
BMI	Business Model Innovation
CBMI	Circular Business Model Innovation
SBM	Sustainable Business Model
SBMI	Sustainable Business Model Innovation

# **GENERAL INTRODUCTION**

The circular economy is a relatively new concept in terms of how resources are used. It can help businesses to gain economic and sustainability benefits at the same time. (Lieder & Rashid, 2016) From this perspective, the circular economy is based on a paradigm shift, as any waste can become raw material. Which is why companies need to closely match their business models to the external business environment.

The World Bank estimates that the circular economy offers an alternative that can yield up to \$4.530tn in economic benefits by 2030, yet only 8.6% of the world is currently applying this circular system. (Boleslaw & Kulik, 2020)

Business plays a pivotal role in the transition to the circular economy (Lu`deke-Freund et al., 2019; Urbinati et al., 2017). A shift in business models is considered by a number of researchers to be the key factor enabling the transition from a linear to circular economy (Ellen MacArthur Foundation, 2015; Bocken et al., 2013; Ghisellini et al., 2016).

A sustainability shift requires more than incremental innovations and sustaining competitive strategies for companies. Business models must be radical and systemic for them to be effective. (Boons, Montalvo, Quist, & Wagner, 2013)

The available research indicates that start-ups are major actors in the circular economy innovation system (Bergset and Fichter, 2015; Hockerts and Wu`stenhagen, 2010; Pruijsen, 2019; Rizos et al., 2016). This type of business can serve as a motivator for other market players (Hoffre´n and Apajalahti, 2009; Hansen et al., 2002), particularly in the case of radical innovation (Henry et al., 2020; Hockerts and Wu`stenhagen, 2010), and can positively contribute to the development of the technological innovation system in the circular economy. (Boleslaw & Kulik, 2020)

Start-up companies typically create radical business models to scale their innovations rapidly. They aim to do this with limited resources, which is why they need external competencies to facilitate the process. (Gans et al. 2018) Also, if start-up companies truly want to challenge incumbents and traditional value chains, the innovation should be architectural, in other words, business model innovation (BMI).

BMI has become a popular concept in the fields of innovation management and strategic management, and in entrepreneurship literature in the past 20 years (Schneider & Spieth, 2013; Foss & Saebi, 2017). The literature sees it as the basis of company performance and competitiveness (Zott, Amit, & Massa, 2011).

The concept of BMI helps to gain an understanding of value creation mechanisms in a rapidly changing and volatile business environment (Pohle & Chapman, 2006). The term ‘business model innovation’ should not be confused with ‘strategy’, even though these concepts are closely linked to each other. Business model innovation is more conceptual, more generic, and less detailed than the strategic planning and implementation process.

# **Chapter 1: Research Question & Methodology**

## **1.1. Objective of the research**

The aim of the circular economy is to increase the value of resources by extending their lifespan, which may lead to economic prosperity and beneficial effects on the environment – reducing waste, greenhouse emissions and pollution (Ness & Xing 2017, p. 572).

Circular economy business models usually require intense interaction with the core business network and also support of other actors. A sustainability shift requires more than incremental innovations and sustaining competitive strategies for companies. Business models must be radical and systemic for them to be effective. (Boons et al. 2013)

This research focuses on circular economy start-ups & how business models can be innovated. The main theories of this master's thesis are business model innovation and circular economy. Both of these are relatively new theoretical concepts, but they are suitable considering the objectives of this research.

Both main theories acknowledge the importance of collaboration in the innovation process, and they complement each other in various ways. In this research, the BMI literature mainly reflects dimensions which are important to the circular economy concept.

The scope of research is motivational due to the novelty of the concept of circular economy as well as the limited number of research that has been, so far, of circular business models.

## **1.2. Research question**

The study focuses on circular economy start-ups. This field area is growing and some start-ups have already seized this opportunity to profit from shifting to more sustainable practices (Sitra 2019). Different parties and players contribute to innovate solutions and to boost business for start-ups in this area. The main objective is to understand the success factors of innovating the circular economy business model. The research question of this study is:

How to innovate successful circular economy-driven business models?

This question is centered on the innovation process itself, because innovations must be implemented at a business model level for them to challenge traditional value chains

(Christensen & Raynor 2003). Only a few circular economy start-ups have succeeded in innovating business models to further develop circularity. This research aims to identify the generalizable success factors in the innovation of circular economy business models.

For a better understanding, the main question is complemented with the following sub-questions:

1. What is the concept of circular economy?
2. What is a circular business model?
3. What does it take for a company to implement a functional circular business model?

The first sub-question seeks to provide a comprehensive understanding of the circular economy: which principles it follows, how the value is created. The second sub-question identifies the principles of a circular business model. The third sub-question seeks to give an understanding of what it takes for a company to move towards a circular economy.

### **1.3. Research methodology**

As the research is predominantly explanatory in its nature and requires understanding of the circular economy, its surrounding environment and business models, a qualitative strategy was chosen to answer the research questions. Qualitative data collection and analysis allows for the researcher to define concepts, categorize different types of behaviors and motivations, map the nature, dynamics and range of a certain phenomenon and develop new ideas or theories. (Ritchie & Spencer 1994, 312.)

This makes it possible to have little to no hypothesis and to explore the outcomes through investigation. An exploratory study was chosen as the two topics ‘innovation process’ and ‘circular economy’ are seldom discussed together and few parallels have been drawn before. The exploration was done in the form of a literature review of existing research within the circular economy and innovation process for startups. The literature was found in online libraries and we also have been given recommended material from our supervisor.

The literature review was used as a knowledge foundation to form the research questions and the interview guide. The empirical study was performed in the form of qualitative, semi-structured interviews to gather additional data from startups and from experts within the literature review topics.

Semi-structured interviews were considered suitable as it makes it possible for the respondents to add additional information to the interview guideline questions that can be relevant for the study. Qualitative interviews were chosen because of the novel research approach and are recommended for an exploratory study (Saunders et al., 2009).

## **Chapter 2: Literature Review & Conceptual Frame**

## 2.1. Literature Review

In this thesis, we are going to tackle “*Business Model Innovation for Circular Economy*” topic, our research will be based on some research papers that has been written in the field previously, which are:

The notion of a circular economy has gained prominence on the agendas of policymakers around the world (Brennan et al., 2015). The concept has also become an important field of academic research with a considerable increase in articles and journals that cover this topic in the last decade (Geissdoerfer et al., 2017). Despite the importance of the circular business model notion, there is considerable lack of clarity about its theoretical conceptualization and position in economic and operations literature. To address this gap, Geissdoerfer et al., 2020, research aims to systematize the state-of-the-art of circular business models and circular business model innovation to increase conceptual clarity and the efficacy of the concepts’ use in theory and practice. Therefore, they conducted a literature review of the circular business models and business model innovation concepts, employing systematic string-based database searches and cross-reference snowballing.

To contribute to reducing that lack of clarity in the literature by means of knowledge systematization, the research is based on a systematic literature review organized in a three-step protocol: data search, data analysis and report (de Almeida Biolchini et al., 2007).

Data search encompassed two steps. First, the search string TITLE-ABS-KEY (“circular\*” AND “business model\*”) was applied to “search for journal articles and reviews in English on the Elsevier Scopus database. As a second step, a backward snowballing approach (Wohlin, 2014) was performed to capture established and also conceptual knowledge falling outside of the database searches or originated prior to the establishment of the contemporary concept of circular economy.

The data analysis part employed content analysis and coding techniques (Dresch et al., 2015) to categorize publications according to the topics of interest for the literature review. Data reporting consisted of integrating, synthesizing and compiling analyses in the reported results.

By contributing to reducing the conceptual lack of clarity and mapping the research landscape, they provide a sturdier basis for the emerging field of the circular business model innovation.

This paves the way for a common understanding and language that can be used to develop the theoretical concept and a conceptual anchor for the nascent empirical exploration of the field. (Geissdoerfer, P.P. Pieroni, C.A. Pigosso, & Soufani, Circular business models: A review, 2020)

In another research that tackles the CBMI tools, Bocken et al. 2019, sees that sustainability has long been recognized as a core issue, as well as an opportunity, for businesses. It has been argued that more radical approaches beyond product and process redesign, such as the move towards new product-service combinations and business models, can lead to higher environmental gains. The circular economy (CE) is an alternative paradigm to the current ‘take-make-dispose’ linear economy to help slow, close and narrow resource loops.

CBMs contribute to the slowing of resource loops by encouraging long product life and reuse of products, closing loops through capturing the residual value from by-products or “waste” through business model innovation, and narrowing resource loops through product design and manufacturing efficiencies. However, CBMs are not yet widespread in business practice because of the need to change the key building blocks of the business, as well as the need to go against dominant business paradigms.

In this paper, they focus on the business level predominantly (recognizing that this level is intertwined with consumers and policy) by identifying CBM tools and approaches as a way to support operationalization of the CE.

To support the business model design, it has been recognized in management literature and practice that the innovation process requires “structure and guidance to frame and focus thought”.

They argue that the infusion of tools in practice would benefit from an overview of the state of the art of CBMI tools, and an assessment of potential contributions of such tools in the business model innovation process.

This paper presents an overview of existing tools and methods for circular business model innovation. The overview seeks to provide structure to the landscape of tools and identifies promising tools to support practitioners in the CBMI process, using criteria developed in this

research. These criteria are developed into a final ‘tools checklist’, which aims to support researchers and practitioners in future sustainability tool development.

The main objective of this study is to identify CBMI tools and their characteristics. In particular, and in contrast to previous reviews, this study centers on business model innovation and CE, with a focus on tools’ rigor and validation, and aiming to address the gap of empirically tested tools. Based on this overall objective, a systematic literature review was performed to identify publications offering CBMI tools. An extensive review protocol of tool selection criteria was applied to create an overview of existing CBMI tools.

Between November 2018 and January 2019, the authors identified publications related to CBMI tools through a bibliographic search. The review focused on publications in the peer-reviewed literature and was complemented by a review of tools from grey literature. The broad search strategy was designed in line with the objective of the paper to create an overview of existing tools and methods suited for CBMI. The authors reviewed practitioner-focused CE-related websites as well as materials from workshops, conferences, and courses attended by the authors.

They emphasize that empirical validation is often very limited or completely lacking for the large majority of potential CBMI tools. Findings show that even among our elected shortlist, most tools have been tested with practitioners only with a limited number of workshops, or with students. Moreover, guidance on how to use the tools in practice is often missing, potentially undermining the more widespread use of tool among business practitioners. (Bocken, Strupeit, Whalen, & Nußholz, A Review and Evaluation of Circular Business Model, 2019)

Antikainen & Valkokari, 2016, in their research, considers that the dominant linear economic model is running out of road, with non-renewable natural resources dwindling and becoming more expensive. The need for a circular economy is evident given that a significant proportion of non-renewable resources is diminishing and natural resource price volatility is increasing (EMF, 2012). Current trends, such as increasing consumption, new generations of consumers, urbanization and employment, tightening legislation, and technological leaps, accelerate the transition to a circular economy.

The entire transformation towards a circular economy sets challenges for established companies. In some cases, it might even destroy the usefulness of their existing capabilities, networks, and business models.

The big question is how to innovate new disruptive business models in this environment when the whole business ecosystem and its dynamics are changing? To understand and support the business world in this transition, deeper understanding of how to develop disruptive circular economy business models is needed.

In this article, they first define and describe what a sustainable circular business model is and outline the related literature streams. Then, they examine the existing business modelling tools in general, in particular those related to sustainability and a circular economy. After that, they propose their framework for circular economy business model innovation that is tested with one Finnish startup to evaluate their circular economy business model. Finally, they draw conclusions and provide future research paths.

A single case study method was chosen as the method for the study. A case study approach is the most suitable in situations where the main research questions are depictive (Yin, 2014). The case they chose for this study was one innovative startup company implementing a circular business model in Finland.

Their main data was collected in a three-hour interview and discussion session with the entrepreneur. In addition to the interview, secondary data was derived from the company's presentation material, websites, and several earlier informal discussions with the entrepreneur.

They mentioned that currently, there is a lack of frameworks for supporting business model innovation in companies in the context of a circular economy. The current tools do not offer the needed understanding in the changing business environment and breaking up of current value chains. Furthermore, the impact of the circular economy models and sustainability should be understood through value creation for all stakeholders. The challenge of re-designing business ecosystems is to find the "win-win-win" setting (Antikainen et al., 2013) that balances the self-interests of involved actors and sustainability impacts. Thereby, the need for change communicated through business model influences and facilitates their actions in order to shape

activities towards joint goals. Based on the results, instead of a single business model innovation, the role of systemic innovations was emphasized.

The findings of this research describe the emerging practices for business model innovation based on a circular economy and thereby point to several research issues that appear worthy of further study. (Antikainen & Valkokari, A Framework for Sustainable Circular Business Model Innovation, 2016)

Geissdoerfer et al. 2018, in a research paper about sustainable business model innovation, they mention that sustainability issues, like growing inequality (Piketty and Saez, 2014) and the deterioration of our natural livelihood (Rockstrom, Steffen, and Noone, 2009) make the transformation to a more sustainable economic system increasingly desirable. To realize this transition, private business is a pivotal stakeholder commanding the most resources and capabilities (Porter and Kramer, 2011). However, technological advances towards sustainability are increasingly incremental, and many companies find it difficult to meet their sustainability targets. Therefore, innovation on the business model level is required to align incentives and revenue mechanisms to leverage sustainable solutions (Rashid et al., 2013).

However, many business model innovations fail (Patel, 2015). This has serious economic implications for companies (Chesbrough, 2007) and leads to considerable delays in the adoption of sustainable solutions (Geissdoerfer et al., 2017a, b).

To explore this issue, they conducted a comprehensive review of the sustainable business model innovation literature. they identified various definitions of the key underlying concepts, which they interpreted and synthesised into working definitions.

The research was based on a structured literature review, following the recommendations of Creswell (2014), Easterby-Smith et al. (2015), and Tranfield et al. (2003). A systematic database search was conducted, followed by cross-reference snowballing.

In the first step, a systematic literature search was conducted. In a second step, relevant cross-references were identified in this initial sample by first scanning the publications' title in the reference section and their context and cited content in the text. In a third step, the final sample was integrated, synthesised, and compiled into the literature review presented in the following. The process was updated on the day of submission.

This research has reviewed the field and has synergised definitions for the key underlying concepts and identified a research gap in the implementation of the business model innovation process, in the challenges of this process, and in the tools to address these challenges.

The literature reveals comprehensive advantages that sustainable business models have for organisations (Nidumolu et al., 2009; Porter and Kramer, 2011). The authors argue that these advantages will make the concept of non-sustainable business models obsolete and sustainable business models will eventually supersede the notion of business models, analogue to competitive advantage and sustainable competitive advantage. Therefore, the conceptual advances of this review will become increasingly relevant for the field at large.

Sustainable business model innovation research might complement established strategic management fields like corporate and product diversification.

Furthermore, they believe that business model innovation can replace some strategic mergers and acquisitions (M&A). Both the high failure rate of business model innovation and sinking transaction costs (Coase, 1937) led to both disruptive (Bower and Christensen, 1995) but also incremental innovation increasingly being developed in start-ups rather than within incumbent corporations.

They propose business model diversification through the development of in-house start-ups as a complement to this M&A approach to business model innovation.

The research questions aim at developing a sustainable business model innovation framework. This framework could guide companies through their business model innovation process by mapping the necessary key activities, potential challenges, and available tools.

Helping managers by providing guidance and the anticipation of challenges related to sustainable business model innovation would yield societal implications. It is intended to lead to a higher adoption rate of more sustainable business models and higher success rate of sustainable venturing and start-ups.

This would allow more efficient and effective deployment of more sustainable solutions and technologies in industry (Rashid et al., 2013), generating more customer benefit, shareholder value, and economic growth. In turn, the creation of more social, economic, and environmental

value for a broader set of stakeholders might work towards the goal of all economic activity - increased happiness (Evans et al., 2014; Frey and Stutzer, 2001). (Geissdoerfer, Vladimirova, & Evans, Sustainable business model innovation: A review, 2018)

## 2.2. Conceptual frame

### 2.2.1. Circular Economy

#### 2.2.1.1. Concept of a circular economy

We presently live in a non-sustainable “Take-Make-Waste” paradigm based on a linear economic model, which causes many environmental problems that will eventually reach a sustainability dead-end as Earth’s resources will be overloaded. This obsolete model will be replaced with a circular economy: an industrial system that is restorative or regenerative by intention and design. In brief, a circular economy is a novel economic model in which the focus is to keep materials in use for as long as possible and also to preserve – or even upgrade– their value through services and smart solutions (Figure 1). As a system-level phenomenon, circular economy business models require interaction between all involved actors, including both the core-business network and other stakeholders. (Antikainen & Valkokari, A Framework for Sustainable Circular Business Model Innovation, 2016)

Figure 1 The idea of the circular economy as a feedback-rich (non-linear) system



(Adopted from Aminoff et al., 2016)

The circular economy will offer extensive business possibilities for both existing and new actors. In a circular economy, the closed loops consist of two supply chains: a forward and a reverse chain. In a reverse chain, a recovered product re-enters the forward chain. Possibilities open up, for instance, for businesses that provide solutions and services along the reverse cycle. The service business has already been seen as a superior business model in many ways compared to selling products, and with the mindset of the circular economy, the potential is even larger. It can be said that one of the major changes in a circular economy will concern consuming and the role of consumers. The relationships between consumers and products and services will change significantly as the concept of owning will be replaced with buying access and performance. In other words, instead of paying for ownership, consumers will pay per use or pay a fee for monthly access (for example, like the model used by the on-demand Internet streaming media service, Netflix).

The transformation towards service businesses can be seen as one of the key solutions in accelerating a circular economy because companies could have incentives to create products that have a long service life, which are used intensively and which are also cost- and material-effective. However, on the negative side of servitization, there might appear the effect called “rebound”. The rebound effect refers to a behavioral or other systemic response to a measure taken to reduce environmental impacts that offsets the effect of the measure, for example due to excessive and incorrect use. Solutions for minimizing this rebound effect are, for instance, co-creation and close relationships with customers in order to build a joint understanding about the importance of enabling a long lifecycle. (Antikainen & Valkokari, A Framework for Sustainable Circular Business Model Innovation, 2016)

#### **2.2.1.2. Comparison between a circular economy and a traditional economy**

Compared with a traditional economy, the differences of a circular economy are as follows.

From the perspective of qualitative analysis, in a traditional economy, the material flow is the material’s one-way flow formed by “natural resources–product– pollutant discharge.” In this type of economy, with the increase in human requirements, additional products are required; therefore, the result is more consumption of natural resources and energy sources, and

simultaneously, an increasing number of wastes and pollutants are discharged into the environment during the production, processing, and consumption processes. If this continues, the result will be the shortage of numerous natural resources and the catastrophic consequence of environmental pollution. Different from this, a circular economy advocates the flow of closed material in the human socio-economic system.

The material is organized into the circular flow process of “resources-products-renewable resources” to allow the entire economic system (including production and consumption) to produce no or little resource and environmental load, thus easing the contradiction between human development and the environment. (Mao, Li, Pei, & Xu, 2016)

### **2.2.1.3. Principles of a Circular Economy**

Described as ‘an industrial system that is restorative or regenerative by intention and design [that] replaces the end-of life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impairs reuse and aims for the elimination of waste through the superior design of materials, products, systems, and within this, business models’, the implementation of the CE could have significant positive impact on production and consumptions systems. Notably, it is ‘an economy that provides multiple value creation mechanisms which are decoupled from the consumption of finite resources.

Engaging with the CE thinking requires the application of three principles that together lead to an economy that is prosperous while being natural capital restorative and regenerative.

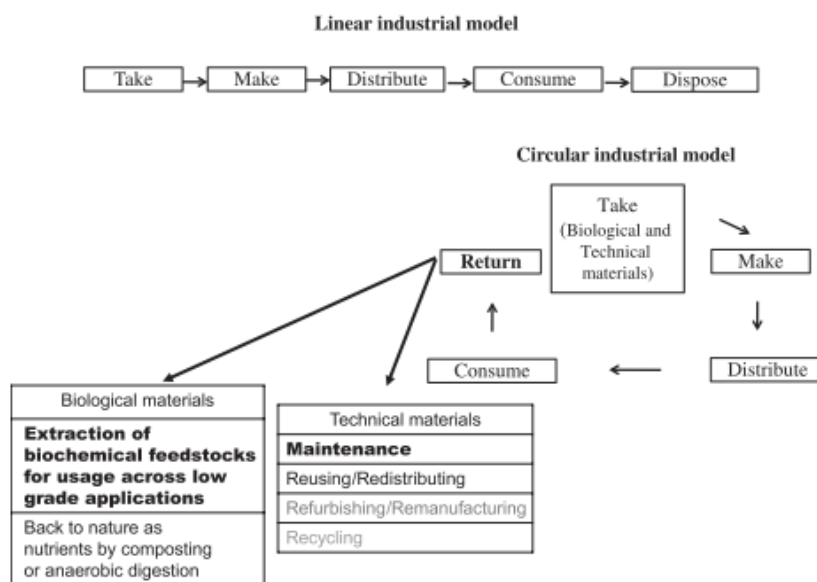
The first one, i.e., **preserve and enhance** natural capital, demands to deliver utility virtually and when products are to be manufactured, only renewable energy and materials should be used whenever possible. At the end of their useful life, renewable materials must be returned to nature to enrich natural capital.

The second principle, **optimize resources yields**, involves maximizing the value of resources over time in both technical and biological cycles.

In a CE, materials follow two usage patterns. Biological or renewable materials are designed without toxic components and can be safely returned to nature when reuse is no longer viable. Technical (synthetic or mineral) materials are conceived to return to the production processes through maintenance, repairing, refurbishing, remanufacturing and recycling, provided that

materials quality is preserved. These materials recovery strategies are hierarchical in the sense that recycling is the least valuable option as the others preserve more of a product integrity and embedded energy and labor. In this system, product durability is enhanced and product sharing contributes to extend a product life cycle. Figure 1 compares a linear with a circular industrial model and the different shades of black in the technical and biological materials box indicate the preferred hierarchy of materials strategies (starting from the darkest shades) for end-of-life recovery. (De Angelis, 2018)

Figure 2 A linear versus a circular industrial model



Source Based on EMF and McKinsey (2012)

The third principle, **foster system effectiveness**, promotes the elimination of negative environmental externalities (pollution in its various forms).

Five, more detailed characteristics of the CE can be derived from the definition given by EMF and McKinsey (2012).

**Design out waste:** in a CE, the concept of waste does not exist and application of this is obtained by circulating materials in biological and technical cycles.

**Build resilience through diversity:** in living systems, biodiversity ensures system resilience; consequently, the CE values diversity in economy (e.g. different scales of business) as necessary to achieve system resilience and prosperity.

**Shift to renewable energy sources:** a CE is powered by renewable energies, which warrants system resilience and prosperity because of both reduced exposure to external shocks, i.e. oil price and supply volatility, and diminished dependence on scarce resources.

**Think in systems:** the CE appreciates the interdependencies existing among the many entities in our complex world and by applying system thinking, it takes them into account considering how to organize the transition.

**Think in cascades:** in a CE, biological materials are cascaded across different applications before returning to nature as nutrients. (De Angelis, 2018)

## **2.2.2. Business Model Innovation**

### **2.2.2.1. The Business Model Concept**

Nowadays, to attempt a business model definition may initially seem challenging, as the research community somewhat disagrees regarding the elements entailed by business models. Numerous definitions exist, and some are the result of the particular field, in which the authors base their research. Nonetheless, most business model scholars refer to three main elements contained by each business model, as also noted upon by Peter Drucker: **value proposition, value creation and value capture.**

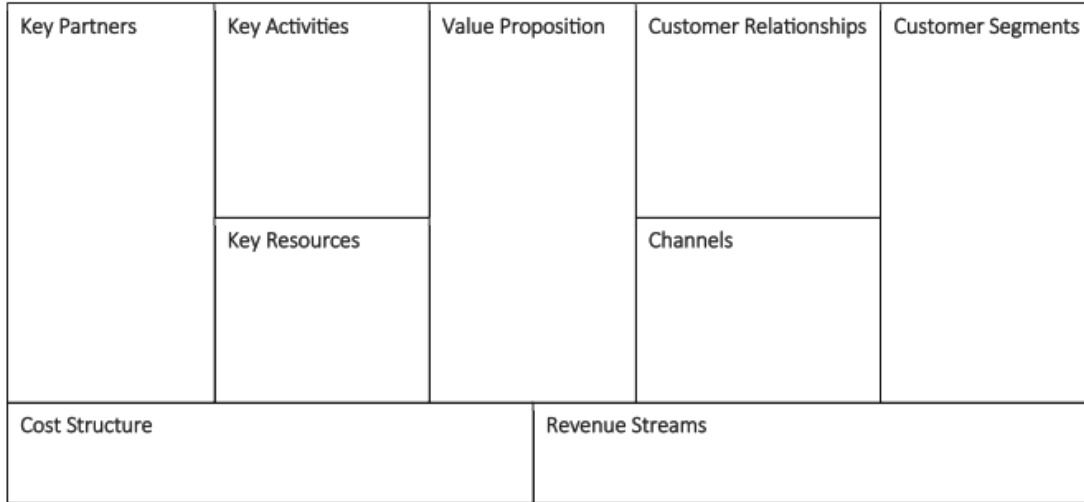
The **value proposition** refers to the products, services, or the mix of both, offered by a company to its customers. It illustrates the potential benefits a company creates for its customers. Value creation discusses the methods employed by companies for making and delivering the value proposition to customers. **Value creation** is generally accepted among researchers as the core of a business model, without which the other two main business model elements would not be possible. In turn, **value capture** defines the subsequent conversion of payments from customers into profits. Interestingly, payments do not always represent monetary transactions and may refer, for instance, simply to attention received from customers.

Research attention towards the business model concept significantly grew in the mid-1990s with the boom in information technology, related emergence of web-based companies, and rapid advancements in e-business—the time of the New Economy. Business models came into

the focus of companies and investors, gaining both business and media interest. At that time, researchers and practitioners were primarily interested in discovering and analyzing value creation mechanisms. However, a large number of the new e-business ventures failed, due to a lack of proper understanding of the value capture mechanisms in e-commerce initiatives. Only after the turn of the millennium and the burst of the dot.com bubble, business model scholars began to understand the significance of value capture mechanisms in defining a business model, and to refine the concept. As well, companies from the Old Economy started to rethink their business models, by adding web-based components to their businesses. This led to a revival of the business model concept and to it being understood as a stepping stone for innovation.

To illustrate the business models the research follows the conceptualization of Osterwalder and Pigneur (2010). The researchers interpret business models as the way in which companies create and capture value, that is, the way in which the value proposition takes shape and is subsequently monetized. To better define value creation and value capture, Osterwalder and Pigneur (2010) introduced nine elements (Fig. 2), which in sum define the business model: the value proposition lies at the center of the model. It not only fulfills the customer demand, but represents the reason why a customer prefers one firm over another. The value proposition is surrounded by eight further elements. Whereas the ones on the left refer to the company side, the elements on the right describe customer-related aspects, as illustrated in Fig. 3. (Voigt, Buliga, & Michl, 2017)

Figure 3 The business model canvas, as illustrated



by Osterwalder and Pigneur (2010).

As highlighted by Osterwalder and Pigneur (2010), the key activities ensure a functioning business model. These represent the fundamental tasks a company completes in order to create the value proposition, reach customers and generate revenues. Hereby, a firm makes use of a network of key partners (such as suppliers, joint ventures or R&D networks) and key resources (human, technological, informational, infrastructural, financial), which make the key activities possible. Since value creation generates expenses, the cost structure includes all costs incurred by operating a business model, as illustrated in the last block on the left side of the graph. On the right side, the customer segments and customer relationships describe the groups of people a company wants to reach, and the involvement on behalf of the company and its customers respectively.

Here, central questions regard whether a company has one main customer segment or whether it chooses to address different types of customers through different types of products and services. As regards the customer relationships, a firm can ask itself whether it sees any role for its customers in the creation of its offers (as is the case of co-development) and what degree of service it should provide to its customers (for instance, tailor-made experiences vs. simplistic self-service). The channels make it possible for a company to communicate with customers and to deliver its goods and services.

Finally, the revenue streams represent the turnover a firm generates—which, depending on the particular business model of the firm, can take the form of usage, subscription or licensing fees. As noted above, some companies may even choose to offer a service or product for free (or subsidize it) to one customer segment, while gaining revenues from a different customer segment, for instance from advertisers. In this case, advertisers can be viewed as both key partners and customers.

Certainly, a company's design of its business model elements depends on its distinct strategy and market positioning. Each company has a specific business model, whether it is consciously aware of it or not, and each company shapes its very own, individual version of a generic business model. However, what all companies have in common is that each business model functions due to the interdependencies among its elements. A brilliant value proposition would not make its way to fulfill a stringent customer demand without channels in place. A company with a well-established and loyal customer base would not be able to thrive without a proper revenue logic. Many times, an alteration (or innovation, for that matter) in one business model element brings along changes in further elements. (Voigt, Buliga, & Michl, 2017)

#### **2.2.2.2. Business Model Innovation**

Business model innovation is a stream in the work on business models, and some authors of the latter assume it to be an implicit part of their conceptualization. Schallmo (2013) and Foss and Saebi (2017) provided an extensive literature review on the topic, which was updated and complemented for this research. A resulting overview of different business model innovation definitions is provided in Table 4.

The concept is investigated to understand and facilitate the analysis and planning of transformations from one business model to another (Schallmo, 2013). The capability for frequent and successful business model innovation can increase an organization's resilience to changes in its environment and constitute a sustain-able competitive advantage (Mitchell and Coles, 2003).

These definitions refer to business model innovation as a change in the configuration of either the entire business model or individual elements of it, either as a reaction to opportunities or challenges in the organization's environment or as a vehicle for diversification and innovation.

Consequently, the concept's main fields of application have been in corporate diversification (Ansoff, 1957) and business venturing and start-up contexts. Based on the described business model innovation examples, four generic configurations of business model innovation can be distinguished. These comprise start-ups, business model transformation, business model diversification, and business model acquisition (Fig. 5).

The differentiation between other forms of innovation and diversification is not clearly defined by the reviewed publications. For example, Lindgardt et al., 2009 define that at least two business model elements have to change for an innovation to qualify as a business model innovation. However, the thresholds for changes in a company's activities to qualify as a change in a business model element remain unclear, for instance, when a product innovation constitutes a new value proposition. Thus, it remains conceptually underexplored under what circumstances, for example, product innovation, service innovation, or changes in the supply chain qualify as a business mode innovation. (Geissdoerfer, Vladimirova, & Evans, Sustainable business model innovation: A review, 2018)

*Figure 4 Types of Business Model Innovation*

<b>Business Model Innovation</b>			
<b>Start-Up</b>	<b>Business Model Transformation</b>	<b>Business Model Diversification</b>	<b>Business Model Acquisition</b>
There is no current business model, and a new business model is created	There is no current business model that changed into another business model	The current business model stays in place, and an additional business model is created	An additional business model is identified, acquired and integrated

*developed by Geissdoerfer et al. (2018 a,b).*

#### Business model innovation working definition

Based on this analysis, we define business model innovation as the conceptualization and implementation of new business models.

This can comprise the development of entirely new business models, the diversification into additional business models, the acquisition of new business models, or the transformation from

one business model to another. The transformation can affect the entire business model or individual or a combination of its value proposition, value creation and deliver, and value capture elements, the interrelations between the elements, and the value network. (Geissdoerfer, Vladimirova, & Evans, Sustainable business model innovation: A review, 2018)

### **2.2.2.3. Circular Business Model Innovation**

There is a considerably smaller range of definitions for circular business model innovation or business model innovation for the circular economy. Most of these definitions are rather simplistic, such as a “shift from a linear to more circular business model.”, “a shift from a linear business model to a circular business model” or “shifting from a linear to a circular production or business model”.

A more comprehensive definition was provided by the authors in a previous paper. Here, based on the work by Bocken et al. (2016), Den Hollander, and Bakker (2016) we concluded that “CE-oriented business model innovation incorporates principles or practices from circular economy as guidelines for business model design. It aims at boosting resource efficiency and effectiveness (by narrowing or slowing energy and resource loops) and ultimately closing energy and resource flows by changing the way economic value and the interpretation of products are approached”.

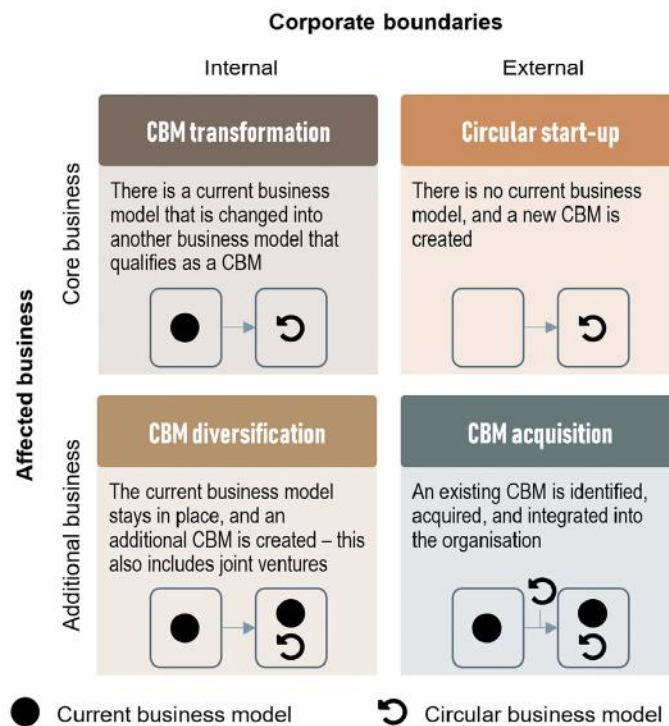
Some authors discuss the business model innovation and the interchangeably used business model transformation concept in the context of the circular economy this seems to be consistent with how the circular business model concept is being based on the business model concept by nearly all authors in our sample.

We can therefore assume that the circular business model innovation concept is related to the business model innovation concept in the same way as circular business models are related to business models. This allows us to define the concept based on the previously synthesized definition of circular business models and the definition of business model innovation used in this research.

Consequently, circular business model innovation can be defined as the conceptualization and implementation of circular business models, which comprises the creation of circular start-ups, the diversification into circular business models, the acquisition of circular business models, or the transformation of a business model into a circular one. This can affect the entire business model or one or more of its elements, the interrelations between the elements, and the value network.

The second half of the definition describes the four different types of circular business model innovation identified in the literature: (1) circular start-ups; (2) circular business model diversification; (3) circular business model transformation; and (4) circular business model acquisition, which we have illustrated in Fig. 5. (Geissdoerfer, P.P. Pieroni, C.A. Pigosso, & Soufani, Circular business models: A review, 2020)

Figure 5 Four types of circular business model innovation



developed by Geissdoerfer et al. (2018 a, b).

1. Circular business model transformation describes the modification of an existing business model. While the initial business model can be either both conventional or circular the resulting business model incorporates circular economy strategies.
2. Circular start-ups refer to the creation of new business models that incorporate circular economy strategies (i.e. cycling, extending, intensifying, and/or dematerializing resource loops) outside of an existing company - with their own brand, employees and resources - although they can be supported by non-independent institutions, such as incubators or accelerators.
3. Circular business model diversification describes the development of new business models that incorporate circular economy strategies from within an existing organization e using their resources and network. The current business model of the parent organization stays in place and the new business models are either integrated into the organization as new businesses or spun-off as subsidiaries. This also includes joint business model innovation projects with other organizations.
4. Circular business model acquisition describes merger and acquisition (M&A) activities that target business models that incorporate circular economy strategies. It comprises the identification, acquisition, and integration of new circular business models. The extent of integration can vary.

Organizations can also combine different strategies, for example, support start-ups with an incubator program and acquire successful participants for their business model portfolio, while also diversifying their portfolio with the outputs of an internal business building unit. They could also divest from their core business towards this new portfolio or leverage acquisitions to introduce circular economy capabilities to transform their core business model. (Geissdoerfer, P.P. Pieroni, C.A. Pigosso, & Soufani, Circular business models: A review, 2020)

### **2.2.3. Tools for Circular Business Model Innovation**

#### **2.2.3.1. Towards Tools for Circular Business Model Innovation**

Circular business model innovation (CBMI) is a relatively recent field, with most tools and methods to support the business model innovation process only having recently emerged. However, in the fields underlying the CBM concept, a plethora of tools and methods has been developed. Work on eco-design and innovation tools, for instance, has been popular for a few decades, with many contributions focusing on design for X, where X refers to various strategies such as recycling and reuse. Later, many tools and approaches to support the design of (sustainable) PSS became prominent. Over the past decades, an increasing number of ‘sustainability tools’ for business model design have been suggested.

Generally, tools take the form of guidelines (e.g., little detail but broadly applicable such as sustainability standards by the International Standards Organization, ISO), checklists (in-depth, but narrow, with application at selected stages of the product development) or more analytical tools (e.g., providing detailed and/or systematic analysis at specific stages of the product development process, such as life cycle assessment). They may cover one or multiple aspects of the product lifecycle and can be qualitative or quantitative in nature. Tools tend to focus on conceptual design, ideation and supply chain involvement as well as integrating stakeholder, customer and managerial concerns.

Despite the plethora of tools, research indicates that tools that fit company needs and expectations well are scarce. Many popular generic tools and approaches (e.g., business model canvas by Osterwalder and Pigneur or the lean startup approach by Ries) appear to be used flexibly in practice, but without a specific focus on CBMI. However, without adequate facilitation, the widespread use of these more generic tools may also ‘dilute’ the focus on sustainability or the circular economy and result in more conventional business cases lacking a clear positive environmental or societal impact.

On the other hand, many tools specifically developed for sustainability or circular innovation purposes, unfortunately, remain unused. This may be due to the fact that they have not been tested empirically and did not include users (most importantly business developers in companies) and their needs in the CBMI process. Furthermore, tools may be too complex or

demanding in terms of time commitment and number of steps in the process, or too context-specific. It is perhaps not surprising that tools such as the business model canvas by Osterwalder and Pigneur or the lean startup approach by Ries are so popular because initially, they look simple and generic, i.e., adaptable to various contexts.

Finally, tools seem to be developed within a particular discipline (e.g., engineering, business, design), but fail to learn from beneficial interdisciplinary insight that could support the usability of tools. As an example of work trying to integrate different disciplines, design science has become more prominent in sustainability business-oriented tools, by specifically using a stakeholder and user perspective, using techniques from design science such as prototyping, and, more generally, testing tools with users iteratively in practice. (Bocken, Strupeit, Whalen, & Nußholz, A Review and Evaluation of Circular Business Model Innovation Tools, 2019)

#### **2.2.3.2. Tools for Circular Business Model Innovation: Gaps and Opportunities**

A number of tools are emerging that focus specifically on business model innovation for circular economy practices. Often tools on CBMI build on approaches from traditional management literature. For instance, a number of business model visualization and mapping tools have been suggested to build on the Business Model Canvas by Osterwalder and Pigneur and emphasize the notion of ‘value creation’.

Popular innovation approaches, such as effectuation (learning from entrepreneurial practice) and lean start-up (focusing on trialing new ideas in practice in a fast and iterative way), have been used as building blocks for recent approaches to CBMI. Many other tool types that focus on ideation for CBMs are also emerging, such as serious games, case databases and typologies.

To support the effective adoption and further development of CBMI tools in practice, first, a clear overview of the state of the art of tools and their potential contribution in the business model innovation process is needed. For eco-design tools, several reviews have been conducted. These reviews focus on evaluating tools according to two dimensions: tool purpose, which describes the type and purpose of the tool, and tool form and characteristics (e.g., diagrams or computer-based tools and evolution of tool development over time).

To the best of our knowledge, only one review to date focuses on tools and approaches that have been suggested for CBMI. However, to begin ‘operationalizing’ the CE, there is a need for a further thorough investigation of tools, in particular because many sustainable innovation tools are developed, but they are not used in practice and there is a risk that ‘generic tools might not lead to CBMs with a clear environmental impact. Furthermore, clear methodological approaches and assessment of tools often lack, even for those developed within academia. Hence, we seek to identify and investigate promising tools with the potential to support CBMI in practice that have been developed in a rigorous and transparent manner through ‘empirical testing’ (i.e., iterations and deliberate learning and improvement) with the potential user.

In addition, to support practitioners and their various objectives and business settings, we investigate additional tool characteristics, such as targeted user groups, and whether guidance on use and validation of the tool is available.

To address this gap, this paper develops an overview of tools for CBMI that provides structure to the landscape of tools and identifies ‘good practice’ CBMI tools. To do this, we describe the purposes and type of the selected tools, characteristics and form and use and validation of the tool, extending earlier work in earlier reviews by also emphasizing the use and validation of tools. Through screening and selecting existing tools according to a set of ‘quality’ criteria, we identify tools with a validated potential to support researchers wanting to develop future CBMI tools and practitioners interested in applying tools for CBMI. (Bocken, Strupeit, Whalen, & Nußholz, A Review and Evaluation of Circular Business Model Innovation Tools, 2019).

Throughout this chapter, we went through the previous research and studies about our topic. We gained more understanding about the notions of circular economy and business model innovation, in a way that will allow us to go deep in our research and facilitate the study of our case in the next chapter.

## **Chapter 3: Empirical Study**

The empirical part consists of three sections. The first section we explained the method used during the study. In the second we presented the company and its circular business model. The third section consists of a semi-structured interview with Walid Hadjadj, manager of Revade Solutions. It gives answers to the sub-questions mentioned earlier.

### **3.1. Method**

A single case study method was chosen as the method for the study. A case study approach is the most suitable in situations where the main research questions are depictive (Yin, 2014).

A case study is also known as a method where data triangulation is often used to increase the quality of the study. Instead of using sampling methods, the case selection maximizes what can be learned in the period of time available for the study. (Antikainen & Valkokari, A Framework for Sustainable Circular Business Model Innovation, 2016)

The case we chose for this study was one innovative startup company implementing a circular business model in Algeria. The case company was already familiar to us through collaborations with the owner in our current research program. Thus, we had easy access to the case and at the same time we were able to utilize our earlier knowledge.

Our main data was collected in a three-hour interview and discussion session with the entrepreneur. We used a semi-structural research guide; however, the session was more similar to a discussion than an interview.

Semi-structured interviews can be regarded as a middle ground between in-depth interviews and structured interviews. Semi-structured interviewing can provide profound and comprehensive information about the subject from different viewpoints. By conducting semi-structured interviews, the aim is to make the interview situation resemble an ordinary conversation between two persons but there are a number of predetermined topics which need to be considered. (Qualitative Methods, M. Trochim, 2007)

The session was recorded and I, the interviewer, also was responsible for taking notes. In addition to the interview, secondary data was derived from the company's presentation material, websites, and several earlier informal discussions with the entrepreneur.

### 3.2. Case study: EURL Revade Solutions

EURL Revade Solutions, created in 2020, specialized in circular economy solutions for businesses. It provides fully scalable solutions for accelerating product reuse and recycling. Such as Revadex platform, which is an Online platform that connects waste producers, collectors and recyclers. Another business model developed by Revade solutions, which is the core of our thesis, is Revadex Office.

Revadex office is a B2B service, it concerns office waste management through sorting boxes, it is a turnkey recycling solution, where the company handles everything from configuration to installation, collection, and recycling through its partners and finally reporting and communication. (Figure 6)

#### 3.2.1. Circular Economy at Revadex

Revadex intervenes on the third pillar of the CE with a service of management of waste turnkey in the company. The sorting at the source of the office waste (papers, plastic bottles, cups, cans, cartridge).

Figure 6 Revadex Office Service Process



(Internal Document)

### 3.2.2. Circular Business Model Innovation at Revadex

Revadex's Business Model Innovation is contributing in the transition towards a circular economy. Since its launch, it contributed to the creation of 3 direct jobs, the sorting and recycling of 4.4 tons of office waste (1670 Kg of papers, 46336 plastic bottles, 14208 plastic cups ...) with a saving of CO2 the equivalent of 14 round trips Algiers – Paris. (Internal reports)

### 3.3. Results and discussion

In order to obtain more information about the topic, and because it's a new field in the world not only in Algeria, we only found & contacted three managers of companies to do the interviews, but only one responded, which is the manager of our study case Walid Hadjadj from Revade solutions.

The main subjects of the interview in its first part about circular economy are the instruments needed for moving towards circular economy, drivers and how regulations are currently seen we used the following questions to gain the large understanding of the topic:

Question one was general to get introduced to the manager and his company	Please briefly introduce yourself and/or your company.
The second & third questions were about the concept of Circular economy and its application in his company & Algeria	What is circular economy? How circular economy can be seen in your company/ Algeria?
We asked the fourth question to know the instruments needed for moving towards circular economy	What does it take for a company to implement a functional circular business system?
The fifth question concerns the drivers to a circular economy	What motivates a company to move towards circular economy?
The last question of this part was about the regulations	Do you find regulations as a barrier moving towards circular economy?

The second part of the interview was about business model innovation as a concept and its application within a circular economy and the key challenges towards moving to a CBMI. the questions were asked as following:

- Briefly, what is a Business Model?
- What is Circular Business Model?
- Do you think your concept of a circular business model will help the transition to the circular economy?
- Do you think your concept of a circular business model is an innovation? Why?
- What are the key challenges for Circular Business Model Innovation?

The entrepreneur was very familiar with ecosystem thinking, trends, and drivers. Value propositions for different stakeholders took most of the time during discussions. Particularly, understanding end user needs and value creation for consumers was regarded as beneficial and seemed to open new insights for the entrepreneur. Also, the different possibilities for revenue models were discussed extensively.

### **Circular Economy**

At the beginning of the interview, the respondent was asked what is circular economy.

According to the interviewee, the circular economy is an economic model to decouple economic growth from the depletion of natural resources based on 03 pillars: the offer of economic operators, consumer behavior and waste management.

The interviewee pointed out that many people have not heard of the term circular economy and if they have, it is used as a synonym for recycling.

### **Instruments needed**

The interviewee was asked to name factors that need to be considered when moving towards circular economy. He emphasized the need for new business models.

The interviewee stated some intrinsic factors such as Responsible sourcing (suppliers, service providers ...); Eco-design of products/services (packaging, assembly ...); industrial ecology

(technological choice, energy and material efficiency...), services/products of the economy of functionality.

The knowledge of one's products were pointed out, according to the interviewee: "It is necessary to go carefully through one's own products; both the raw material acquisition and where the products end."

The respondent adds: "We need to change the way we think, and also search for the added value of circular economy. What is it for your company and products? The company's management needs to believe in circular economy."

### **Drivers**

The interviewee was asked about his opinion on the biggest drivers of the circular economy.

The entrepreneur stated that the circular economy is a system of production, exchange and sharing allowing social progress, preservation of natural capital and economic development. By this choice, the company aims at attracting new skills that are more and more concerned about the economic impact on the environment, positive image with customers/suppliers, and new economic opportunities.

The interviewee brought out that the business goes hand in hand with the environment. He adds "environmental values and saving the world is mandatory, but it needs to be understood that by doing so we can create good business."

It was mentioned during the interview that the transition is about the brand and image of the company. The company gains added value by moving towards circular economy.

### **Circular economy regulations**

The respondent highlighted the lack of incentive regulation for businesses/consumers. He also mentioned that the current system is built for a linear thinking and then causing so-called bottlenecks.

The importance of regulations was also pointed out by the interviewee, he said that one of the key points of regulation is to ensure that players in the field do not ruin the environment. Regulation is a key element in our economy and in fact it is kind of a catalyst for technical

development. The stricter demands you have, the more you need to put effort on so the likelihood to achieve a clean technical solution is bigger.

The interviewee thought that regulations as a barrier moving towards a circular economy is a common excuse which gets highlighted often. A good expertise in a specific legislation matter is needed in order to take a stand on it.

The findings demonstrate that the current regime is hindering the scale up of circular business models and the political system currently does not create enabling conditions.

# Conclusion

This section reflects on the research questions, points out the main inferences drawn from the theoretical part and interview and makes suggestions what the researcher sees as the most interesting circular business models for Revade Solution. First, answers are provided to the three sub-questions. The answers given to the sub-questions enable the ability to answer the overarching research question; “How to innovate successful circular economy-driven business models?”.

The circular economy is an economic model that has recently gained a lot of awareness as people have started to realize that our traditional linear economy model is not sustainable. Unlike the linear "take-make-dispose" model, the circular economy aims to keep products, components and materials at their maximum utility and value at all times. Its objective is to eradicate waste, not only from manufacturing processes, but also systematically throughout the life cycles and uses of products and their components.

The circular economy requires transformative change at all levels: from government policy to business models, and from technology systems to individual consumer choices. Change is not possible without courageous companies, and it cannot happen overnight.

The circular business model differs from traditional models by focusing on creating value for a wider range of stakeholders and considering benefits not only from an ecological but also a social and environmental perspective.

The information gained from the theoretical and empirical parts of the study shows that within a company product design, research and innovation activities play a key role in creating a circular economy. The importance of new business models was highlighted by the interviewee.

The company's management must be willing to change the company's strategy to a more circular one. Courage and innovation are important drivers of the circular economy. A company cannot move towards a circular economy without working closely with other actors' participants in the value chain.

## **Limitations**

Firstly, the field of the study is new, and only a limited number of researches on the circular economy has been carried out. The previous studies have not investigated all the circular business models from one industry's perspective. The limited number of previous studies means there are no right and wrong answers. Thus, we have room for innovative thinking and that should be considered when evaluating the results.

## **Suggestions for future research**

This work generated topics for further research. Since the topic of the circular economy is not so widely studied yet, especially the circular business models are rather new, it seems that companies that actually implement a circular economy have not yet reported changes and impact on business.

However, the REVADEX case study was useful to better understand circular business models and how they can be applied. The case study aimed to introduce new ideas into each of the business models. However, further analysis and research is required.

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