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SHAPING THE CONSUMPTION OF MOBILITY

A netnographic study of Shared Mobility Business Models' Circular Value Propositions

Master's thesis 30 credits

Author: Carlos Rosel

Supervisor: Hervé Corvellec

Lund University
Department of Service Management and Service Studies

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1. INTRODUCTION

> *"Present economies are mostly service economies saturated with products reinforced by services and some examples of alternative systems of product use"* (Mont, 2002, p. 238).

This section aims to present the background, the purpose and the research questions of this thesis. These are followed by a presentation of the scope and the outline of the following chapters which complete this paper.

1.1. Background

The circular economy (hereafter CE) has become a prolific field of study which has received great interest among practitioners (Achterberg, Hinfelaar, & Bocken, 2016; Ellen MacArthur Foundation, 2012; International Reference Centre for the Life Cycle of Products, Processes and Services, 2015; Kok, Wurpel, & Ten Wolde, 2013; Wijkman & Skånberg, 2015) and policy makers, both inside the EU (European Commission, 2014; European Commission, 2018; European Environment Agency, 2017; Government of the Netherlands, 2016) and other governments internationally – among which Japan and China are relevant actors (Gao, 2016; PRC, 2008). Additionally, the CE concept has been built upon multiple scientific fields as well as emerging and semi-scientific concepts (Korhonen et al., 2018). Some of the most relevant research fields that have contributed to the research of CE are the industrial ecology (Iritani, Saavedra, Ometto, & Pavan, 2018), the cleaner production (Li & Ma, 2015; Van Berkel, Willems, & Lafleur, 1997), the industrial symbiosis (Chertow, 2000; Han, Liu, Liu, & Cui, 2017), the eco-efficiency (Laso et al., 2018), cradle-to-cradle (Linder, Sarasini, & Loon, 2017; McDonough & Braungart, 2002; Niero & Hauschild, 2017), sustainable, environmental and green economics (D'Amato et al., 2017; Skene, 2018), product-service systems (Kjaer, Pigosso, Niero, Marie Bech, & McAloone, 2018; Tukker, 2015), and the performance economy (Stahel, Walter R., 2010). Moreover, it has been a great driver for business models innovation (Bocken, N. M. P., de Pauw, Bakker, & van der Grinten, 2016; Urbinati, Chiaroni, & Chiesa, 2017).

Such interest can be justified as the CE is presented as 'a paradigm shift' from a non-sustainable linear economy (commonly conceptualized under the 'take-make-use-dispose' production and consumption logics) (Bocken, Nancy M. P., Olivetti, Cullen, Potting, & Lifset, 2017; Ellen MacArthur Foundation, 2013)) to a restorative and regenerative economic system (Ellen MacArthur Foundation, 2012; Geissdoerfer, Savaget, Bocken, & Hultink, 2017; Ghisellini, Cialani, & Ulgiati, 2016) that enables decoupling[1] value creation mechanisms from the consumption of finite resources (Ellen MacArthur Foundation, 2015). In other words, the CE's ultimate goal is to break the link between economic development and environmental resources depletion (European Commission, 2014; Lieder & Rashid, 2016(Ghisellini, Cialani, & Ulgiati, 2016)) by improving resource productivity and efficiency (Nußholz, 2017), which simultaneously is expected to reduce environmental impacts of production, consumption and post-consumption processes (Kjaer, Pigosso, Niero, Marie Bech, & McAloone, 2018). Under a resource-efficiency focus, the CE demands significant changes in business planning and strategy (Lacy, Keeble, & McNamara, 2014) while it provides potential opportunities for innovation (Linder & Williander, 2015). Therefore new innovative business models for a CE are necessary (Lewandowski, 2016; Urbinati et al.,

[1] "Resource decoupling means reducing the rate of use of (primary) resources per unit of economic activity. This 'dematerialization' is based on using less material, energy, water and land resources for the same economic output. Resource decoupling leads to an increase in the efficiency with which resources are used" (UNAP, 2011, p. 4).

2017) which, by developing circular strategies, enable the introduction of loops designed to slow, narrow[2] and close (Bakker, Wang, Huisman, & den Hollander, 2014; Bocken, N. M. P. et al., 2016; Nußholz, 2017) the resource throughput of products and materials all along the life cycle, preserving, thus, their embedded environmental and economic value over time (Nußholz, 2017).

The development and implementation of new business models is one of the main 'building blocks' for a transition towards the CE (De Angelis, 2018; Kirchherr, Reike, & Hekkert, 2017), although a proper transition towards the CE requires other fundamental elements such as the circular design of products and materials, global reverse logistics networks and a number of enabling conditions (see e.g. (Bocken, Nancy M. P. et al., 2017; Ellen MacArthur Foundation, 2015b; Lewandowski, 2016). Regarding the first CE building block, the creation of innovative business models or the adaptation of the already existing ones to the CE means re-thinking the elements of the business model framework – namely value proposition, value creation and delivery and value capture (Osterwalder & Pigneur, 2010; Richardson, 2008) – for implementing the 'CE proposition' (De Angelis, 2018).

Therefore, the function of circular business models is to innovatively integrate "the value creation architectures of businesses" into circular strategies which operate via "resource efficiency through circular resource flows to preserve the embedded environmental and economic value" (Nußholz, 2017, p. 2). Thus, circular business models (CBM) are defined as *"[a] circular business model describes how an organization creates, delivers, and captures value in a circular economic system, whereby the business rationale needs to be designed in such a way that it prevents, postpones or reverses obsolescence, minimizes leakage and favours the use of 'presources' over the use of resources in the process of creating, delivering and capturing value."* (Den Hollander & Bakker, 2016, p. 2).

The transition from a linear to a circular economy demands a new contract between business and consumers (Ellen MacArthur Foundation 2012). In circular processes of production and consumption, the value creation and capture logics of new circular business models involving products with a medium to long life cycle (e.g. cars or bicycles) are proposed to shift from the traditional ownership-based consumption (related to the 'take-make-use-dispose' production and consumption logics) to an access- or performance-based consumption and paying mechanisms (e.g., performance-for-pay models, renting, sharing or pooling schemes, return and reuse, and collaborative consumption among others) (De Angelis, 2018; Ellen MacArthur Foundation 2012; 2013). These types of CBM challenge the linear concept of 'product ownership' for that of 'product access' and 'service performance' and reinforces models of collaborative consumerism and even the very concept of consumers, who are reconceptualized as users (Ellen MacArthur Foundation 2013; 2015).

By keeping the ownership of products in order to deliver a functional result or product performance, firms are incentivised to reduce costs of materials by developing certain resource-efficient strategies (reduce them, use the longer, etc.) in one or various phases of product's life cycle (Bocken et al., 2016; Lacy et al., 2015), which can vary according to their

[2] Bocken et al. (2016) do not include narrowing resource loops as a circular strategy. Narrowing stands for an efficient resource use of materials by reducing the materials use per product during the production phase, which has been in certain linear business models (see e.g. (Laso et al., 2018)). However, the narrowing resource flow strategy generates exponential resource efficient results if combined with slowing strategies, as resources may not be only reduced in quantity but in speed, and therefore reducing the waste and emission that ultimately cannot be cycled back to the system.

core value proposition and the extent to which they control the life cycle of capital goods and materials used to deliver their services (Tukker, 2004; 2015).

Multiple various approaches have been proposed for establishing the principles that may lead the creation of new business models for the CE. The principles are commonly directly related to the management of resources through efficiency-focused strategies. The most commonly referred principles of the CE are the ones known as the 3Rs, this is, to *reduce, reuse and recycle* (Ghisellini et al., 2016; Kirchherr, Reike, & Hekkert, 2017; Lieder & Rashid, 2016; van Heek, Arning, & Ziefle, 2017) and the 4Rs principle (which adds *recovery* to the already exiting 3Rs) (Ellen MacArthur Foundation, 2013; Kalmykova, Sadagopan, & Rosado, 2017; Kirchherr et al., 2017). A more modern and complete conceptualization to implement BM innovation according to the CE principles is the one proposed by (Ellen MacArthur Foundation, 2015a) known as the ReSOLVE framework. The ReSOLVE Framework (Ellen MacArthur Foundation, 2015a) (p. 25) is built upon the principles to "preserve and enhance natural capital by controlling finite stocks and balancing", to "optimise resource yields by circulating products, components and materials in use at the highest utility at all times", and to "foster system effectiveness by revealing and designing out negative externalities". The result is a framework that "offers companies a tool for generating circular strategies" (p. 26) in order to REgenerate, Share, Optimise, Loop, Virtualise and Exchange (ReSOLVE), driven by innovation for their business models.

Ultimately, CBMs develop a certain circular value creation logic that is driven by one or several circular economy principles and its related resource-efficient strategies for closing, slowing and/or narrowing resource loops (Bocken et al., 2016). Such value creation logic will fundamentally be determined by the firm's core value proposition – involving a circular strategy (Nußholz, 2017) –, value creation and delivery and value capture – which will re-capture value via resource efficiency and the change in material flows (Richardson, 2008).

1.2. Research Issue

1.2.1. The role of the value proposition as a driver for innovation in circular economy business models

The present research paper focuses on studying the core component of circular business models: the value proposition (Lewandowski, 2016). Value proposition is defined as "the value the firm will offer to a customer relative to the competition" and includes the reasons why "a customer will value a firm's (proposed) offering" (Richardson, 2008, p. 139). Nußholz, (2017) theorizes about the value proposition in circular business models, discussing that it involves a product-service offering which contains and intentionally employs a circular strategy to create value and develop relationships with customers. The author argues that "[t]he offer can be devised in a way that proactively addresses preservation of the economic and environmental value embedded in products, parts, and materials. Thereby, material flows associated with an offer can be altered towards increased resource efficiency and closed-loop resource flows" (p. 6).

Various studies and scholarly publications already supply a wide understanding of circular business models (CBM) in forms of taxonomies (Urbinati, Chiaroni, & Chiesa, 2017), circular strategies (Bocken, de Pauw, Bakker, & van der Grinten, 2016), conceptual frameworks (Lewandowski, 2016; Moreno, De los Rios, Rowe, & Charnley, 2016) and conceptualizations (De Angelis, 2018). These studies aim to frame the concept of business model into the circular economy context, principles and logics, thus, providing valuable conceptual knowledge and tools for the creation – or the transition towards – circular business models. In this extent, literature on circular business models treat the "value proposition" as a term

that requires to be reconceptualized, as much as the other business model building blocks do. De Angelis (2018, p. 65), for instance, proposes a conceptualization of value proposition for CBMs which contains two elements: the "'circular offerings' (e.g. products as services; greater convenience; dematerialised products; superior product durability and ecological performances; product upgradability; take-back schemes) and 'circular relationships' (access over ownership, e.g. leasing, renting, sharing)". Lewandowski (2016), as another example that follows the former argumentation, conceptualizes the core elements of the business model within the circular economy, developing the term 'circular value proposition' regarding the various possible circular products and services, both ownership-based and product-service systems (ownership-less). In this regard, the author relates circular value propositions with dematerialized offerings (e.g. virtual consumption) and the collaborative consumption (e.g. sharing, renting, pooling).

The literature, therefore, on circular value propositions focuses on providing scholars and practitioners normative perspectives on what circular value propositions are and how these must be developed (e.g. qualified), and shape the processes of value creation and delivery – e.g. a dematerialized offering of products as services which are made accessible to customers virtually or physically via rent, pool sharing, designed to be circular as much as the employed products and materials are reusable, recyclable, recoverable and/or enable reducing the material and residue throughput (Bakker et al., 2014; De Angelis, 2018; Lewandowski, 2016; Tukker, 2016). And, however, how are circular value propositions actually framed and qualified? What do we know about the practical performance of value propositions which embed circular principles?

1.2.2. Empirical research approaches to the study of circular economy value propositions

The available literature regarding the practical performance of the value proposition in the CE is quite scarce at the present time. Indeed, according to the existing available studies, the empirical study of CE value propositions has just recently taken over in the last few years, as the following research papers show below.

Regarding the research of the practical execution of value propositions, (Stål & Jansson, 2017, p. 546) aim to fill the "gap regarding how firms attempt to shape sustainable consumption in practice". For such purpose, the two authors explore value propositions entailing product-service systems (PSS) of nine Swedish fashion firms' business models. They conclude that fashion firms delivering PSS value propositions propose sustainable value throughout the whole value chain by involving the consumer in sustainable consumption practices beyond the moment of purchase, suggesting consumer's involvement and cooperation during the product's use as well as at its disposal for later recovery, introducing take-back systems. On the other hand, and adopting a qualitative research approach, (Manninen et al., 2018)'s study focuses on the environmental value propositions – meaning a promise of environmental betterment – of CE business models. The paper ultimately develops and proposes a framework to practitioners for the evaluation and verification of the environmental value propositions for the generation, or transition towards, new circular business models. As last example of the available research papers within this field of study**,** (Lieder, Asif, Rashid, Mihelic, & Kotnik, 2018) develop an empirical study on customers preferences based on CE value propositions from Stockholm-based washing machine schemes. By employing a quantitative research choice-based conjoint analysis method, this study shows that, at the Stockholm area, there is an overall interest in service-oriented offerings including pay-for-access and monthly renting washing machines over ownership-based consumption. It is particularly relevant customers' preferences on

getting a wider range of service-related propositions, followed by flexible payment schemes and, lastly, the generation of greater environmental gains. Aggregately, CE value propositions are perceived positively, and these can influence customers to shift from an ownership-based washing machines consumption to an ownership-less circular consumption, although social awareness on CE must be created in advance by articulating communication efforts.

Empirical research on circular value propositions has focused so far on researching European firm's circular business models, existing a great focus on the Nordic countries (see e.g. the cases studied chosen by Lieder et al., 2018; Manninen et al., 2017; Stål and Jansson, 2017) whose populations are known to be specially aware about the environmental challenges and the role of consumption on sustainable development (Bauer, Watson, & Gylling, 2018). The present thesis aims to fill this gap by taking over the empirical study of shared mobility service's value propositions – which have never been the object of study in a value proposition qualitative research study. The sample is constituted by ten heterogeneous business models both given the variety of geographical markets in which they operate and the wide range of shared mobility business models that this sample performs.

Therefore, shared mobility service firms constitute a great part of this thesis' research issue, not only because it is the empirical source upon which the study of CE value proposition is made upon, but also because shared mobility is becoming a growing research field of its own – which I come to present next.

1.2.3. Shared mobility as a research field of study

Shared mobility or mobility in the sharing economy "is characterised by the sharing of an asset (a vehicle) instead of owning it, and the use of technology (apps and the Internet) to connect users and providers" (Santos, 2018, p. 9). In the last decade, the shared-mobility industry has developed multiple shared modes of transportation and, consequently, new shared mobility schemes have arisen (Shared-Use Mobility Center, 2015), partly thanks to the digital revolution (Bondorová & Archer, 2017) and to the related growth of the sharing economy as a new socio-economic model (Finger, Bert, Kupfer, Montero, & Wolek, 2017). These new transport modes which are neither traditional private transports (e.g. private car, motorbike or bicycle) nor mass-transit services (e.g. railways, urban buses, undergrounds, etc.) are referred as shared mobility services or shared modes (Finger et al., 2017).

New shared mobility systems such as ridesharing, ridesourcing and ride-splitting (Shared-Use Mobility Center, 2015) have joined an industry in which public transport means have been the predominant service offerings. Additionally, a greater mobility access has been reached thanks to the emergence and growth of car-, scooter- and bike-sharing platforms (among others) in cities and municipalities, offering sustainable mobility alternatives to car ownership (Ferrero, Perboli, Rosano, & Vesco, 2018) and a wider range of product-services offerings in comparison with the traditional renting and leasing mobility schemes. Finally, these shared mobility schemes can operate within a larger bundle of new mobility services, also known as 'Mobility as a Service' (MaaS) (Bondorová & Archer, 2017). In this extent, mediating platforms, also known as "Aggregators", (Shared-Use Mobility Center, 2015) offer MaaS, by enabling a seamless use of combined mobility services – both traditional public transport modes and new shared mobility schemes – via online platforms and mobile app technologies (Finger et al., 2017).

Shared mobility takes the shape of business models that have the potential to deliver improved efficiency of personal transport (Ratti & Santi, 2017) and, thus, help to solve some of the environmental and mobility issues such as congestion, polluting emissions or the major occupation of public space by privet cars (Bondorová & Archer, 2017). Additionally, MaaS can be instrumentalized to promote shared mobility in combination with public and mass-transit services as an alternative to the private vehicle (Finger et al., 2017). Even though the existing carsharing service offerings seem not to be able to cope with the most infrequent and demanded needs, the new peer-to-peer carsharing platforms are enlarging the supply of vehicle models available (Sprei & Ginnebaugh, 2018).

Overall, shared mobility services are conceptualized as the novel and more sustainable way of transportation that is to replace private vehicle ownership (Ferrero et al., 2018) and change the way urban population use transport means (Prieto, Baltas, & Stan, 2017). However, the existing research on the shared mobility field shows that not all the shared mobility business models are so evidently sustainable.

1.3. Aim of the Study and Research Questions

The empirical research made in CE business models' value propositions has shown, so far, the great challenges that both companies and customers have to face in order to co-create value within the various existing circular value creation logics (Bocken et al., 2016; Moreno et al., 2016). Innovation brought to the business model is both driven and portrayed by a firm's value propositions (Kindström, 2010; Lieder et al., 2018). Circular value propositions introduce significant changes in the way firms create value throughout the value chain and how it finally reaches the consumer in the shape of products with a greater degree of servitization (Kuijken, Gemser, & Wijnberg, 2017), while service offerings are increasingly proposing performance value**,** allowing greater degrees of resource efficiency (Baines et al., 2007; Chou, Chen, & Conley, 2015). Circular value propositions have been also proven as great game changers regarding the relationships in between consumers and firms (Ellen MacArthur Foundation, 2012), transferring new responsibilities over the product to consumers (Stål & Jansson, 2017).

Against this background, this thesis follows the short path drawn by scholars in the empirical study of CE value propositions, aiming to provide answers to how firms attempt to shape urban mobility consumption in practice. For doing so, this paper takes over the empirical study of the value propositions of ten innovative shared mobility business models which constitute on its own some practical examples of circular business models from a theoretical perspective[3]. The research focuses on studying the embedded value qualities of these shared mobility service firms' value propositions within a built CE business model theoretical framework, which is supported by the *Value Proposition Canvas* (Osterwalder, Pigneur, Bernarda, Smith, & Papadakos, 2015) as a theoretical tool that enables detailed identification of the qualitative constituents of the value proposition. By employing a netnographic qualitative research method for the gathering of the circular studied value propositions, this study aims to understand how service firms manage and qualify their

[3] In this extent, the study of shared mobility business models' value propositions as an example of circular economy value propositions is theoretically accurate considering these business models' thriven value creation logic is 'sharing', and being considered sharing a circular strategy principle Ellen MacArthur Foundation (2015, a) as well as one of the driver of 'circular relationships' in between the firm and the customer (De Angelis, 2018).

value propositions in order to shape the consumption of urban mobility through their delivered shared mobility services.

Therefore, the research question that drive this study are the following:

1. *How do shared mobility business models, as an example of circular economy business models, qualify their value propositions?*
2. *How do shared mobility service firms attempt to shape the consumption of mobility in practice?*

Next the theoretical contribution of the present master's thesis is presented.

1.3.1. Theoretical contribution of the thesis

The present thesis aims to contribute theoretically to the circular economy business model field by empirically researching the value propositions of a heterogeneous sample of shared mobility business models. Considering the transformative potential of CE strategies in the way firms can propose, create and capture value, this study aims to shed light upon those business models driven by 'sharing' as a major value creation logic. Taking into account both the growing interest on empirically studying the CE value propositions and the lack of research made within this field – and particularly in the case of shared mobility firms as a growing phenomenon of its own – this thesis also aims to give answer to the call that some relevant authors have already sent regarding developing further empirical research on CE value propositions (see e.g. Lieder et al., 2018), particularly from those value propositions enhancing product-service systems (see e.g. Stål & Jansson, 2017) and sharing platforms as some of the most relevant and innovative CE business models (Lacy et al., 2014) in the shared mobility industry.

This study also aims to offer empirical knowledge about how shared mobility service firms operationalize their value propositions, highlighting which are value qualities embedded in these and, ultimately providing knowledge of how firms through their value propositions can shape the urban mobility consumption in practice. Several authors already argue regarding the sustainability potentials of shared mobility services business models in the urban environment (Bondorová & Archer, 2017; Finger, Bert, Kupfer, Montero, & Wolek, 2017)), however research in this extent is still scarce, given the lack of empirical knowledge regarding the actual effects of shared mobility and its potential (positive and negative) effects in urban environments (Santos, 2018). Thus, this study addresses this gap by focusing on how shared mobility producers construct (or shape the co-creation of) the consumption practices and behaviour of consumers throughout their proposed value propositions.

1.4. Structure of the Paper

This paper is structured as follows:

- In chapter 2 the theoretical background of this study is established. First, concept of value is presented by using the business model framework (2.1.1) which enables the later introduction and conceptualization of the value proposition canvas (2.1.2). Later the concept of circular business models is introduced (2.2) according to its principles (2.2.1) and related taxonomy of circular business model strategies (2.2.2). Ultimately, a Circular Value Proposition Canvas is presented based on the previously presented theoretical framework (2.3)
- Chapter 3 contains an accurate explanation of the research methods (3.1) employed during the data gathering research process, as well as the limitations and issues encountered during the data gathering process. Then, the 10 selected shared

mobility service firms are briefly introduced (3.2) including their shared-use mobility typology (SEMC, 2015) as well as the stablished methodological requirements for their selection in this study. Ultimately, the empirical research process is explained (3.3).

- Chapter 4 includes a detailed analysis of the empirical study according to the proposed theoretical framework (chapter 2).
- In chapter 5 the conclusions from the analysis of the empirical data are presented (5.1) and then a discussion is introduced putting this study and its findings within the actual context of shared mobility systems, PSS and the business models for the CE (5.2).
- Chapter 6 contains both a detailed literature list of the used sources (6.1) as well as a list of all the empirical data sources (6.2) from which selected quotes are included in chapter 4.

2. THEORETICAL RESEARCH

This chapter seeks to provide to the reader a clear understanding of the theoretical concepts that frame this study. For doing so section 2.1. introduces the concept of business model given the frameworks developed by Osterwalder and Pigneur (2010) and Richardson's (2008) business model canvas with "value" as a central concept (2.1.1). Additionally, the Value Proposition Canvas (Osterwalder, Pigneur, Bernarda, Smith, & Papadakos, 2015) is presented (2.1.2) in order to deepen into the value proposition concept that will later frame theoretically this study. Section 2.2. explains the "sharing" concept from circular strategy perspective and brings up those business models and strategies that while framed as circular can be put in practice by developing product sharing activities as value creation logic. Then, in section 2.2.3, the literature on shared mobility business models is reviewed which will help the reader to comprehend the analysis chapter given the variety of this business models value creation logics and infrastructure. Ultimately, section 2.3 summarizes the employed theoretical framework that has been used to develop the analysis of the ten studied shard mobility business models' value propositions.

2.1 The Concept of 'Value' in the Business Model Framework

2.1.1. The Business model: Concept & Framework

The business model is commonly defined as a structured management tool that used to represent the organizational structure of a company (Nußholz, 2017), representing the relationship between its different areas (Demil & Lecocq, 2010) and the value creation processes of an organization (Richardson, 2008). The business model represents "a set of strategic decisions that defines how companies create, transfer, and capture value according to their internal activities and relationships with stakeholders" (Urbinati et al., 2017 p. 489-490). The BM articulates the business logic of a specific firm, having to describe and represent *what* value is provided to customers, *how* is such value provided and *which* are the financial outcomes of such value provision (Osterwalder, Pigneur, & Tucci, 2005).

There exist various attempts to conceptualize the business model framework, among which Osterwalder & Pigneur's (2010) "business model canvas" is one of the most acknowledged examples. Richardson (2008) organizes a business model framework that reflects a strategic thinking about value. Richardson's framework is built upon three main components which swing around the concept of value: the *value proposition*, the *value creation and delivery*, and *value capture* (Figure 1).

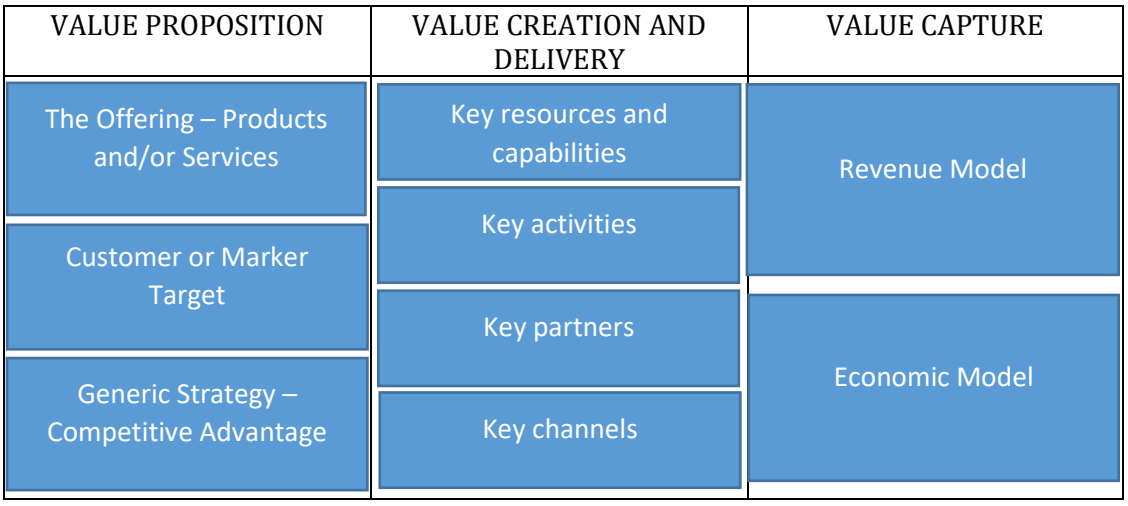

Figure 1. Business model conceptualisation adapted from Richardson (2008).

Value Proposition *– What value is provided and to whom?*
The value proposition is one of the principal elements of the business model framework as stated by (Chesbrough & Rosenbloom, 2002) and included in the commonly acknowledged 'business model canvas' by (Osterwalder & Pigneur, 2010). Richardson (2008, p. 139) defines the value proposition as "the value the firm will offer to a customer relative to the competition" and includes the reasons why "a customer will value a firm's (proposed) offering". Richardson details three main elements that compose the term value proposition:

1. *The offering* shows what a firm sells that potentially contains value for the customer.
2. *The customer or market target* sets to whom a firm aims to deliver value.
3. *The firm's generic strategy* is the value proposition's potential to create a competitive advantage and winning customers.

Richardson (2008, p. 139) states that "[t]he strength of the firm's value proposition rests on its strategic positioning" given that "value proposition represents the value the firm will offer to a customer relative to the competition". Regarding the firm's strategic positioning, the author considers that a value proposition will preferably include a competitive advantage that enables serving superior value to the market.

Value creation and delivery *– How is value provided?*
The value creation and delivery system defines "how the firm will create and deliver that value to its customers and the source of its competitive advantage" (Richardson, 2008, p. 138). Under value creation and delivery, the following business model elements can be found (Nußholz, 2017):

1. The *key resources and capabilities* which are the firm's source of competitive advantage (Richardson, 2008).
2. The *key activities* (and processes), which are the many activities that the firm takes on such as create, sell, produce, or deliver value to the customer (Richardson, 2008).
3. The *key partners*. Richarson (2008) specify them as the value chain, the value network and the activity system, within which activities are divided among the firm and firm's key suppliers, partners or competitors, and distributors. The whole firm's value creation network should be able create and deliver the value proposition, therefore "[t]he resources and capabilities of the various actors and the division of activities among them should match the value proposition.
4. Key *channels*, which must be set up in order to deliver value and to create an effective communication flow with customers and partners.

Value capture *– How does a company make profit and capture other forms of value?*
Richardson (2008) considers two main elements that configure the value capture:

1. The revenue model which "describes the sources of revenue or different ways that the firm receives money in exchange for its services" (p. 140).
2. The economic model which "refers to the revenues, costs, and expenses that go into the profit equation. It also includes the timing of exchanges" and reflects "the ability of the firm to gain a competitive advantage and generate superior profit margins" (p. 141).

Both the revenues model and the economic model combined allow a firm to describe how the money is made. Value capture is an essential component for a successful business model and, along with the value proposition, these two are organic elements for the design of the firm's value creation and delivery (Richardson, 2008).

2.1.2. The Value Proposition Canvas

The purpose of this thesis is to study in depth how value proposition are delivered to customers. Therefore, it is necessary to stablish how value propositions are conceptualized and designed within the business model framework. For such purpose I make use of Osterwalder, Pigneur, Bernarda, Smith, & Papadakos' (2015) Value Proposition Canvas.

The value proposition canvas is developed as the relationship between *customer segments* and *value propositions* (Kyhnau & Nielsen, 2015), which are two of the pivotal building blocks of the business models canvas (Osterwalder & Pigneur, 2010). The value proposition is composed of "the products and services offered to the customer, the relievers of customers pains, and the creators of customer gains pertaining to the tasks and jobs he or she needs to accomplish with the assistance of the offered product or service. Thus, on the customer's side are the jobs, pains and gains related to doing the jobs." (Lewandowski, 2016, p. 10). A representation of the value proposition canvas is presented in Figure 2.

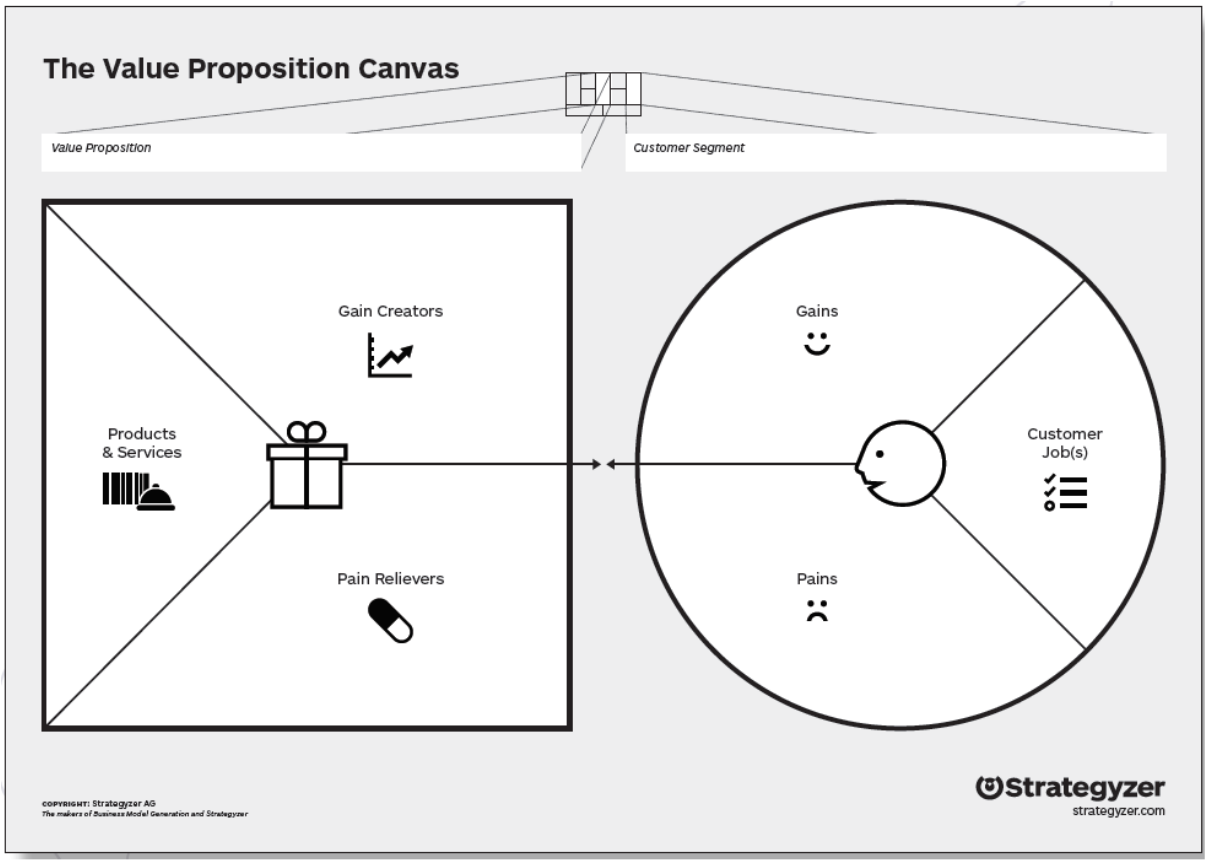

Figure 2. The Value Proposition Canvas (Strategyzer, n.d.). Image retrieved from: https://platform.strategyzer.com/resources

The value proposition canvas provides a framework which facilitates the analysis and understanding of delivered value propositions by identifying which products and/or services are offered, which value is embedded in these propositions and how this value is going to fulfil certain customer needs when is co-created together with the customer.

2.2. Business Models that enable 'sharing' in a Circular Economy context

The definition of circular economy is an insightful starting point for contextualizing the concept of 'value' for the circular economy. *"A circular economy is one that is restorative and regenerative by design and aims to keep products, components, and materials at their highest*

utility and value at all times, distinguishing between technical and biological cycles. This new economic model seeks to ultimately decouple global economic development from finite resource consumption" (Ellen MacArthur Foundation, 2015b, p. 2). Nußholz (2017) adds that in order to keep resource flows at their highest utility for as long as possible these must be redesigned towards closed loops that can preserve both the environmental and economic value of products, components and materials over time. Many authors recognize that business models are one for the fundamental building blocks for the transition to a circular economy (see e.g. (Bocken, N. M. P. et al., 2016; De Angelis, 2018; Lewandowski, 2016) and, particularly the capacity of circular business models in supporting the development of strategies that enable the preservation of the embedded value of resources at their maximum possible level of utility (Nußholz, 2017).

The theoretical scope of this research aims to frame those business models from the CE literature which enable product/asset sharing as their primary value proposition. In order to do so, first we need to understand how 'sharing' is conceptualised in the CE business model literature and to which resource efficiency strategies does 'sharing' lead to. Then I will review all those business models which, operating within the CE paradigms, are driven by 'sharing' as principle from which propose, create and deliver value to customers.

2.2.1. Sharing as a principle that leads to design resource-efficient strategies

The elemental constituents of circular business models, which are the principles that drive the creation of circular strategies and the theorisation of circular business models, are commonly defined as either the 3Rs – Reduce, Reuse, Recycle – (Ghisellini et al., 2016; Lieder & Rashid, 2016; van Heek et al., 2017), the 4Rs – Reduce, Reuse, Recycle, Recover – (Ellen MacArthur Foundation, 2013; Kalmykova et al., 2017; Kirchherr et al., 2017), or even as the 6Rs – Reuse, Recycle, Redesign, Remanufacture, Reduce, Recover – (Jawahir & Bradley, 2016). Among these and other perspectives, the ReSOLVE framework (Ellen MacArthur Foundation, 2015a, p. 23) stands out for translating three fundamental principles – to "preserve and enhance natural capital", to "optimise resource yields", and to "foster system effectiveness by revealing and designing out negative externalities" – into 6 concrete business actions, among which *'Share'* is highlighted as CE strategy. The business actions that emerge from sharing as a circular business model strategy are to (Ellen MacArthur Foundation, 2015a, p. 25):

- *Slow* the speed of *product loops* and *maximise utilisation* of products by sharing them among users (e.g. P2P sharing of privately-owned cars or public sharing of a pool of vehicles);
- *Reuse* products throughout their technical lifetime; and
- *Extend the life* of products through *maintenance, repair and design* for durability

The business actions proposed by the Ellen MacArthur foundation (2015a) regarding to 'sharing' are resource efficiency strategies which refer to both some of the Rs principles such as 'reuse' and 'redesign', as well as to 'slowing resource loops', which refers to the strategical management of the life cycles of the resources (Bocken, N. M. P. et al., 2016; Moreno, De los Rios, Rowe, & Charnley, 2016).

In order to deepen in and clarify the business actions that are highlighted in ReSOLVE's framework (2015a) 'sharing' business actions, it is worth to look at the three proposed circular strategies in detail.

a. *Slow speed of products' loop* and *maximize utilization of products by sharing*

On the one hand, the slowdown of the product flow within a loop is proposed. Some authors, such as Bocken et al. (2016, p. 309) have developed a categorisation for circular business model strategies "according to the mechanisms by which resources flow through a system", which these authors classify as *closing, slowing and narrowing* resource loops. Bocken and colleagues (2016) argue that *closing* loops in business model innovation has to do with recapturing value from by-products or from a linear business model perspective what is considered as 'waste', introducing circularity into the system. Business model strategies for *slowing* resource loops motivate long product life and product reuse, introducing the time variable into the resource flow within the loop and fostering a more efficient use of resource value. Finally, *narrowing* stands for an efficient use of resources by reducing the material use per product during the production phase. As it can be concluded from here, slowing resource loops as a resource efficient strategy would not only and primarily influence in the speed by which products and materials flow within a system but, in some extent, slowing resources within 'loops' requires those resources (products, materials or parts) to be brought back into the system in order to be reused or extend their life-time, as the word 'loop' implicitly means to implement resource circularity into the system. In conclusion, to 'slow speed of products loop' refers to developing and implementing resource efficiency strategies that both enable products to last longer during their useful life and to be returned into the system in order to be reused, refurbished or repaired, thus keeping the highest value of technical materials during product's use phase (i.e. middle loops) (Bocken et al., 2016; Ellen MacArthur, 2015a; Kjaer et al., 2018).

On the other hand, maximizing the utilization of products by sharing is related with maximizing the efficiency and augmenting the intensity of the use of products during their use-phase through shared utilisation (together: e.g. public transport or carpooling) or serial utilisation of goods (one after another: e.g. carsharing) (Stahel, W. R., 2014).

b. *Reuse products through their technical lifetime* & c. *Prolonging life of products through maintenance, repair and design for durability*

Reusing products over time as a resource efficient strategy is strictly related with *slowing* resource loops (Bocken et al., 2016). Walter Stahel (1994) considers the reuse of goods, along with the recycling of materials, as one of the two possible kind of loops within a system. The reuse loop implies product life extension through "the design of long-life products; the introduction of service loops", i.e. "reuse […], repair, reconditioning, and technical upgrading"; "and a combination of these" (p. 179). With all, the reuse of goods contributes to both *slowing down* the flow of materials along their lifetime as well as to preventing waste (narrowing waste loops) and reducing environmental impairment in all stages of the product's life.

Therefore, and according to Stahel (1994) the second and third (b. & c.) business actions proposed by EMAF (2015a) for the 'sharing' strategy are co-related as reusing products through their technical lifetime is one of the strategies that enables extending the life of these products and, for doing so, product-life extension activities can be implemented, such as maintenance, repair, reconditioning, etc., as well as a durable and reusable product design must be developed (Joustra, de Jong, & Engelaer, 2013). Simultaneously, we have seen that reusing and prolonging product's life activities are within the same resource loop strategy: slowing resource loops (Bocken et al., 2016) as "reusing goods and product-life extension imply a different relationship with time" (Stahel, 1994, p. 179). Therefore, what the ReSOLVE framework (EMAF, 2015a) is presenting as three different business actions within the 'share' strategy are, indeed, all part of the same resource efficiency plan based on maintaining and enlarging the highest value of products and resources for the longest time

within the middle loop (i.e. use phase) while sharing these products can additionally maximize their utilization.

In the next section I will review those circular business models that focus on slowing resource loops and enable sharing as possible business model strategy.

2.2.2. Circular Business Models that enable Product Sharing

So, how are these strategies translated into operating business models? Well, several authors have taken over the development of a taxonomy or CBM archetypes (e.g. (Bakker et al., 2014; Bocken, N. M. P. et al., 2016; Lacy et al., 2014; Moreno et al., 2016). Nevertheless, there seems to be an agreement among authors that Product-Service Systems is one of those business models archetypes that most strongly resonate with the sharing strategy and the circular management of resources (Bocken, N. M. P. et al., 2016; Kjaer et al., 2018; Tukker, 2015)

2.2.2.1. Product-Service Systems

Product-Service Systems (PSS) are defined as a specific type of value proposition consisting in a mix of products and services, supporting networks and infrastructure so that jointly can fulfil the customer needs and make a lower environmental impact than traditional business models (Mont, O. K., 2002; Tukker & Tischner, 2006). PSS have been defined as "one of the most effective instruments for moving society towards a resource-efficient, circular economy" (Tukker, 2015 p. 76), as PSS "allow firms to create new sources of added value and competitiveness" (Tukker, 2004, p. 247). Among these new sources of added value one of the most highlighted innovative capacities of PSS is their potential to substitute traditional material intensive production of goods for a customer utility-focused provision of services (a mix of products-services) which are usually related with changes in the ownership structure (Mont, O. K., 2002). Indeed, PSS are usually highlighted for proposing in their value offerings a crucial change in the ownership structure by which the products involved in the product-service mix are not meant to be sold but accessed and used by consumers, being the manufacturer or service provider who retains the ownership of the physical product (Lay, Schroeter, & Biege, 2009), and thus, internalise the benefits of circular resource productivity while being incentivised to reduce the material flows in production and/or consumption processes; and even PSS can contribute to 'dematerialise the economy' (Baines et al., 2007; Manzini & Vezzoli, 2003; Mont, O. K., 2002) and lower its environmental burden (water pollution, greenhouse gas emissions and waste) (Stål & Jansson, 2017).

So, given the proposed changes in the ownership structure, the potential of reducing material consumption and improving resource efficiency, PSS provide a good fit for those business models that aim to create and deliver value through a servitized economy in which products are shared among users.

Arnold Tukker (2004) develops a triple PSS business model categorization according to the mix of product-service offered: product-, use- and result-oriented PSS. Given that product-oriented PSS shifts product ownership from the producer to the consumer (i.e. focuses on selling the product) and adds additional services to the PSS offering, I will only highlight the characteristics of use- and result-oriented PSS given the focus of this study. According to Tukker (2004) in *use-oriented PSS* the 'physical part' of the offering, this is, the product, still plays an essential role in the value creation logic of the firm, however, firm take whole responsibility for the management of its products along their lifespan, while the consumer eventually accesses and uses such products in order to gain the desired utility value. Tukker (2004) establishes three main use-oriented business models:

- *Product leasing*. This PSS business model creates and delivers value usually ranting the consumer and individual and unlimited access to the product, including the firm's responsibility over the maintenance, repair and control. Value is captured via regular fees for the use of the product (e.g. corporative car leasing allows companies to rent cars for the employees' use for periods that may long several years).
- *Product renting or sharing*. The value creation and delivery lies on consumers sequentially accessing and using the product for usually short periods of time, being the firm responsible for its maintenance, repair and control. Value is captured by pay-per-use fees (e.g. carsharing companies usually charge for both kilometres driven and renting time).
- *Product pooling*. Similarly, to product renting or sharing, this business model proposes services in which the product can be used simultaneously by the users (e.g. traditional mobility systems such as us the city bus for which users pay a fixed fee regarding the required distance of the trip).

Lastly, result-oriented PSS focus on delivering utility or performance according to an agreed upon result with the consumer (Tukker, 2004). The firm's ownership over products enables product longevity, reusability, maintenance and sharing as drivers of revenues and reduced costs (Lacy et al., 2014). Tukker (2004) establishes three distinctive business models:

- *Activity management/sourcing.* Outsourced third-party activities are commonly contracted upon performance indicators which are meant to control the quality of the result; however, the performance of the activity does not necessarily lead to a reduced and more efficient use of resources.
- *Pay per service unit.* This is one of the most common business models among printer producers. Following this example, the value proposition includes the producer to take full responsibility for all those activities that ensure the proper functioning of the printers (i.e. maintenance, repair, paper, toner and replacement of the printer when needed) and the user obtains higher tangible value by keeping certain control over the result. Value is captured based on level of service and number of products included in the offering and this usually includes a premium fee given the resulting high cost structure of the producer.
- *Functional result.* The value proposition of these business models departs from the delivery of a result to the client in rather abstract terms, not being directly related with specific products or technology. The service provider is the only and ultimate responsible for the fulfilment of the agreed result and takes all the liabilities related with the costs of the products and materials involved.

Several authors consider that PSS can contribute to build business models for the circular economy. For instance, one of Bocken et al. (2016) circular business model strategies for slowing resource loops is the 'access and performance model'. With this model Bocken et al. (2016) get inspiration from use-oriented PSS in order to propose a circular business model that enables users to access and obtain the desired performance from products without needing to own the physical products. According to the authors "[t]his business model allows companies to capture financial benefits from going circular […] [as] it can introduce economic incentives for slowing resource loops both with manufacturers (increasing profits from e.g. durability, energy efficiency, reusability, reparability) and users (reducing costs when reducing use, e.g. thinking before using a car) and potentially reduces the total need for physical goods" (p. 312-313). Accenture Strategy (Lacy et al., 2014) include 'product as a service' as one of their five identified circular business models. Lacy et al. include product longevity,

upgradability upside down, reusability and sharing as some of the strategies for this business model that make uses of the circular advantage (to capture additional and residual value) and the performance-based value creation and delivery.

Kjaer et al. (2018) develop a study in which they seek for the leading connection in between PSS as enabler for CE strategies, and these as necessary leaders to absolute resource decoupling. Kjaer et al. (2018, p. 4-5) identify five possible PSS strategies: *'operational support'* (involving additional services such as product monitoring and personnel training), *'product maintenance*' (through preventive maintenance, repair, or upgrades), *'product sharing'* (the PSS provider retains the ownership of products which are shared among users), *'take back/EoL systems*' (the PSS provider decides which products are reused, refurbished, recycled, etc.), and '*optimized result'* (providing a functional result that dematerializes the offering). Regarding the 'product sharing' strategy, Kjaer and colleagues relate this PSS strategy with two resource reduction enablers:

1. *Intensified product usage*. In use-oriented services product sharing can improve the utilization rate of under-utilized products (such as private cars) (Mont, 2004) which additionally may reduce private ownership and a lower demand for their production. In result-oriented services the PSS provider can intensify the unused capacity of products.
   In order to 'ensure net resource reduction' (NRR = avoided resources – added resources) it must be ensured that there is both market potential and consumer acceptance to obtaining utility through product sharing which can successfully substitute private ownership and reduce net production.
2. *Product system substitutions*. In case the use-oriented PSS provider has the capacity to introduce 'take-back/end-of life system' services, recaptured resources can substitute the extraction and production of new resources. Additionally, use-oriented PSS can substitute other more resource intensive product systems (e.g. using carsharing service instead of buying a private car). Result-oriented PSS providers have the greatest control over their assets which makes it easier for introducing resource efficient products and technologies and in substitution for others.
   By "displacing more resource intensive systems" (p. 7) the goal of ensuring net resource reduction may be achieved by effectively assessing that the PSS's take back system, which can enable e.g. product refurbishment and repair, consumes less resources than the displaced alternative product system.

PSS are not the only business models that propose sharing as a way to create customer utility and generating value (Tukker, 2015). The following section reviews the sharing platforms model that commonly operate in the sharing economy.

2.2.2.2. Sharing Platforms

Sharing Platforms model proposes a platform for collaboration among users, either individuals or organizations, for sharing the use, access or ownership of products (Lacy et al., 2014). Value is created and delivered through e.g. P2P systems (direct digital network where individuals share products with others without being a third party involved) or P2B2P systems platforms (in which companies carry out sharing transactions over peer-to-peer systems) (Daunorienė, Drakšaitė, Snieška, & Valodkienė, 2015) which enable the sharing of "overcapacity or underutilization, increasing productivity and user value creation" (Lacy et al., 2014, p. 14). This model focuses on maximizing utilization; thus, value is captured from products whose utilization or ownership rates are low, via e.g. pay-per use/hour or leasing arrangements. It is most commonly found among companies

specializing in increasing the utilization of products relying on other parties for the manufacturing of products (Lacy et al., 2014).

2.2.3. Shared Mobility Systems Business Models

The modern eruption and growth of shared mobility business models is a phenomenon which particularly gains momentum after the global economic crisis of 2008, driven both by a general growing environmental consciousness and a greater access to the Internet, powered by the development of information and communication technologies (ICTs) (Cohen & Kietzmann, 2014). Shared mobility business models operate within the so called 'sharing economies' defined as "a new socio-economic model that has taken off thanks to the technological revolution, with the internet connecting people through online platforms on which transactions involving goods and services can be conducted securely and transparently" (European Parliament, 2015c, para. 110 quoted in Finger et al., 2017, p. 21).

The European Parliament (Finger et al., 2017) proposes two forms of shared mobility: first, hiring an asset – business models that enable individuals to get access to e.g. car- or bikesharing schemes –; and second, hiring a transport service – meaning those business models such as Uber and Blablacar, which provide the mobility service for people to be driven from one location to one destination. The main defining characteristics of shared mobility business model are that they are fundamentally enabled by technology (digital applications, smart devices, internet connection, and internet of things (IoT), among other ICTs) and that these technologies are widely accessible in those markets where these business models operate (Finger et al., 2017).

Some authors such as (Hartl, Sabitzer, Hofmann, & Penz, 2018) highlight the necessity of differentiating between B2C shared mobility services from those other P2P markets. In this extent, some authors that underline the P2P mobility sharing models agree upon embracing the term within the so-called "collaborative consumption", which commonly involves two non-professional individuals to share their under-utilised vehicles (with or without profit seeking) via an online platform (Finger et al., 2017). On the other hand, the B2C markets involve professional service providers enabling platforms interaction and offering mobility services on-demand, which not necessarily employ under-utilized vehicles, but usually private companies and institutions acquired new vehicles (such as the case of Transport for London with the Santander bicycles) for the provision of mobility services (Finger et al., 2017).Therefore, some authors prefer to include B2C shared mobility services within the so-called 'collaborative economy', defined as "a complex ecosystem of on-demand services and temporary use of assets based on exchanges via online platforms" (European Commission, 2015a, p. 3, quoted in Finger et al., 2017, p. 18).

Regarding how many and which are the business model that may complete the taxonomy of the shared mobility economy, the existing proposals in the literature are quite heterogeneous (see i.e. (Cohen & Kietzmann, 2014; Santos, 2018), though certain agreement among the main business model is settled among scholars and practitioners. Thus, here I lay out the principal business models of shared mobility:

Carsharing

Carsharing can be defined as "a service that enables a group of individuals to share cars with other persons" and which ultimately involves a wide range of business models, technology and target markets (Hartl et al., 2018 p. 89).

B2C carsharing provides members of a carsharing scheme to obtain access to an automobile for a short period of time, whereby usage is charged based on hourly rental fees (Hartl et

al., 2018; SUMC, 2016). Hart et al. (2018) include 5 features that characterise B2C carsharing services: 1) vehicles are made accessible for their use to customers, 2) vehicles are commonly located near users' homes, workplaces or public transportation stations, whose ownership is retained by the company, 3) vehicles are booked in advance by users, 4) the renting of the car is made for a short period of time, and 5) users can access these vehicles on their own (usually enabled by some short of mobile technology or devise that grants such access to a car). Additionally, types of carsharing include:

- *Roundtrip* (Cohen and Kietzman, 2014) or *two-way (station based)* carsharing models (Ferrero et al., 2018) require customers to pick up and return the vehicle to the same predefined station.
- *One-way (station based)* (Ferrero et al., 2018) or *point-to-point* (Cohen and Kietzman, 2014; SUMC, 2016) carsharing allows users to pick up a vehicle at one predefined station and to drop it off at another predefine station of his choice.
- *Free-floating* models (Ferrero et al., 2018) offer carsharing services in which cars are freely parked in public parking lots within an indicated operational area, allowing users to pick up and park back cars at any of these areas.
- *Non-profit/cooperative carsharing* (Cohen and Kietzman, 2014) involve members that contribute with their own resources and self-managing a non-profit carsharing organization.

P2P carsharing relies on the intermediation role of online platforms and/or mobile technology in order to connect private individuals with idle vehicles with potential drivers (Cohen and Kietzman, 2014). Similar to B2C carsharing, P2P involves short-term access to privately-owned vehicles via the payment of an hourly rental fee that usually includes fuel and insurance coverage, being the car owner the ultimate responsible of the vehicle's maintenance, cleanliness and operativity (Hartl et al., 2018).

Ridesharing

Ridesharing business models are "[a]pp-based short-distance ride-sharing services" (Bondorová & Archer, 2017, p. 3) which "involve additional passengers to a pre-existing trip" (SUMC, 2016, p. 9). Both technologically and from a business model perspective, ridesharing services have split into various models in the last decades, of which the following have been identified:

Pooling. Pooling, which in most of the cases is related with *carpooling*, is related to vehicle owners letting other passengers to share a ride in the same vehicle to and from same or similar destinations (Cohen and Kietzman, 2014). Pooling nowadays makes use of advance mobile technologies and advanced routing software to aggregate and analyse passenger demand and pickup locations (Shaheen & Cohen, 2018). Polling, additionally, maximizes vehicle occupancy while reduces the total number of needed private vehicles, congestion, energy consumption, parking demand (Shaheen and Cohen, 2018) and, particularly, the required numbers vehicles for delivering traditional taxi services (Bondorová & Archer, 2017). Other forms of carpooling/pooling include:

- *Flexible carpooling*. It involves drivers and potential riders to arrange carpooling trips by including designated meeting places to pick up passengers along the trip, instead of door-to-door carpooling (Cohen and Kietzman, 2014).
- *Non-profit/cooperative carpooling.*
- *Vanpooling*, which is often run by public transit systems (Cohen and Kietzman, 2014), focuses on supporting a larger number of commuters than carpooling (SUMC; 2016).

P2P Ridesharing (also referred as ridesourcing by the Shared Used Mobility Centre (2016)) has become one of the most known and ubiquitous forms of shared mobility thanks to firms such as Uber and Lyft (SUMC, 2016). P2P ridesharing providers make use online platforms, leveraged by the power of social network and mobile geolocation to connect passengers with drivers who use personal, non-professional, vehicles (Cohen and Kietzman, 2014; SUMC, 2016).

Ride-splitting. Ride-splitting make use of online platforms and app technology to match a driver with more than with passenger, allowing the business model to optimize the capacity of a car while generating cost saving for the user (Finger et al., 2017; SUMC, 2016). Ride-splitting can be fixed – passengers a picked up and driven from and to the same location –, or flexible, also known as dynamic ridesharing, "with passenger pick-ups and drops-off along automatically designed routes requires a mature software and a very dense volume of drivers and passengers" (Finger et al., 2017, p. 47).

Bikesharing

Bikesharing provides hourly access to bikes accessibly distributed across a city, usually involving a membership and a usage fees (Cohen and Kietzman, 2014). The fastest growing business models are those IT-enabled public bikesharing, which makes use of technology for providing real-time information about their availability, rebalancing bike's demand at docking stations (SUMC, 2016). Bikesharing is commonly advertised by institutions and firms as a complementary transport mean to existing public transit (Cohen and Kietzman, 2014). Bikesharing business models can be differentiated according to their finance models:

- *Street furniture bikesharing*. Both bikes and docking stations play the role of advertising pieces of 'furniture', which as become a major breakthrough in the development of the European bikesharing marketplace (see e.g. JCDecaux in collaboration with Lyon) (Cohen and Kietzman, 2014).
- *Publicly owned bikesharing*. The public institutions of the cities own and take full responsibility for the operations of local bikesharing programs. In other cases, municipal institutions opt for granting the management to privet operators (Cohen and Kietzman, 2014).
- *Sponsorship-based bikesharing* (Cohen and Kietzman, 2014). An example of this can be found in the Santander Cycles model, managed by Transport for London and sponsored by Santander Bank.
- *Non-profit bikeharing*. Some programs rely on governmental subsidies, donations and municipal funding support. Such is the case of B-Cycle bikesharing programs in the United States and South America, which is locally developed by a non-profit operator in each city (Cohen and Kietzman, 2014).

Bikesharing business models can also be organised according to their IT-based accessibility systems:

- *Dock-based systems*. It is the most extended form of public biksharing in which IT-enabled docks distributed across a service are permit users to pick up and return to the same or another station (SUMC, 2016).
- Dockless or GPS-basead systems allow users to geographically track the location of the bikes thank to GPS technology, thus allowing a free parking within a same service area without the need of fixed dock station. Bikes have their own security systems which enables locking the bikes to public bike racks (SUMC, 2016).

- *Low-cost, tech-light systems* avoid the use of in-bike or dock-based technology and, instead, users sign up online and receive an email or text message with the code to open the bike's lock (SUMC, 2016).
- P2P bikesharing is a sharing system among individuals in which users rent (in exchange of money) or borrow (for free) idle bikes per hour or day (SUMC, 2016), usually making use of an online platform or mobile app as intermediator.

E-bike & Scooter Sharing

E-bikes sharing schemes are becoming a growing trend among European cities such as Madrid (e.g. BiciMAD). Similarly scooter and e-scooter sharing in Europe are also expanding in the shape of motorised fleets for the use of short/medium distances for a short period of time (see e.g. the case of Muving in various cities of Spain) (SUMC, 2016).

2.3. Theoretical Framework

I make use of the concepts introduce by Osterwalder et al.'s (2015) Value Proposition Canvas which allows me to differentiate the different product-service offerings, the gain creators and the pain relievers that shared mobility sharing firms propose to their customer segments, identifying those gains, pains and customers jobs which the studied firms aim to provide, relieve and co-create respectively. Simultaneously, the framework provided by Richardson (2008) allows to contextualize those value propositions within the general value creation logic of firms in order to find parallelisms and common ground among the studied firms.

Additionally, the theoretical understanding of PSS and sharing platforms given capacity to develop circular resource efficient strategies along with the theoretical conceptualization of shared mobility business models provided by several authors (among which Cohen & Kietzmann, 2014; Ferrero, 2018; Finger et al., 2017; Hartl et al., 2018; Santos, 2018) allow me to deepen into their value offerings with an understanding of these business models resource efficiency potential together with their general value creation, delivery and capture structures.

3. METHODOLOGY

This chapter presents first the main method employed – netnographic research – for the development of the empirical study and the reasons why it is a proper method for exploring the value propositions of shared mobility service firms. Then a classification overview of the eleven studied firms is presented. Ultimately, both the data collection and analysis research processes are shortly explained according to the theories and research focus at hand.

3.1. Research approach to the research question

My philosophical standpoint nourishes from critical realism (Scott, 2005), based on an intersection of epistemological constructivist position and ontologically upholding a minimal realism (Raskin, 2008). Critical realism, therefore, accepts that "there are objects in the world, including social objects, whether the observer and researcher can know them or not", but is also 'critical' as soon as "any attempts at describing and explaining the world are bound to be fallible, and also because those ways of ordering the world, its categorisations and the relationships between them, cannot be justified in any absolute sense, and are always open to critique and their replacement by a different set of categories and relationships" (Scott, 2005, p. 635). In terms of social constructionism and indeed, personal construct psychology, this translates into an ontological stance which argues that we come to know "external reality indirectly through our constructs, even though an outer reality exists" (Raskin, 2008, p. 8).

The netnographic method is particularly suitable to this research as it provides me, as a researcher, direct access to 'the existing' different external realities: the understandings and conceptions that companies have about their services and how such services may (or might) create and deliver value to customers. From a critical realist perspective, the assumptions and assertions that companies make about the value creation processes in their delivered shared mobility services are taken as real or authentic, as far as they respond to the subjective perspective of the studied companies in a given moment of time (also subject to change along the time). The obtained subjective understandings of how shared mobility business models create and deliver value (given their delivered value propositions) to customers and other stakeholders are critically observed as for such conceptions of value creation respond only to the limited vision and interests of the studied service companies, not taking into account the parallel (and eventually simultaneous) value co-creation that customers carry out in pre-, during and post-consumption processes (see e.g. Vargo & Lusch, 2004).

In short, netnography is an appropriate method to empirically get into the 'inside' perspectives of companies as these often actively publish their propositions of value and their contributions to create and deliver value in multiple online platforms. The obtained insights can be used to challenge what we already assume to know about the value propositions in circular business models, particularly regarding those business models that propose the substitution of product ownership for that of access and performance-oriented consumption of services.

3.2. Netnographic research

The main research method employed for the development of this study is the netnographic research method. In order to establish a comprehensive and organised working process with the mentioned method, I have mainly followed '*Netnography: redefined*' (Kozinets, 2015) methodological book which has served as a guide both prior and during the netnographic research process.

Netnography (or online ethnography) uses social science methods which essentially thrives on ethnographic research and methods – which are based on participant observation –, but

they are adapted for the online world (Kozinets, 2015), or as Kozinets himself says: "for the contingencies of online communities and online cultures" (Kozinets, 2011, interview extract). In fact, netnography makes use of communication technologies to study online activities, especially in relation to consumer-decision making (SAGE Publications, 2018). Furthermore, it requires the researcher to interpret human communication in real-life contexts, being aware that such human communications are moulded by new technologies (Kozinets, 2015). Indeed, this method helps to study the existing connections between the online and offline social lives, and the possible implications between them: "netnography's not just about the online component. It also is a way to study that online component, but you don't ignore the physical component. So, it's an interrelationship of both" (Kozinets, 2011, interview extract).

Among the several ethnographic research methods, netnography combines "archival and online communications work, participation and observation, with new forms of digital and network data collection, analysis and research representation" (Kozinets, 2015, p.1). In its quest to rich insight and understanding, netnography is a flexible qualitative research technique which is complementary with a wide range of other methods, such as the online survey method, internet interviewing – which can include from email or chat-based interactions to Skype or Facetime audio visual connections –, internet diaries or journal documents – usually obtained from participants involved in the research – fruitfully combined with depth interviews, or social network analysis (Kozinets, 2015), among other methods that may take place in the 'offline realm'.

3.2.1. Research design and empirical research process

The empirical research has been designed based on Kozinets' (2015) methodological guidance for carrying out a netnographic research. The theoretical framework introduced in section 2, on the other hand, has guided and influenced the research design and later empirical research process.

Before approaching the online research field, I have designed a systematic research protocol that has both structured the data gathering process and guided me through the various online platforms that I have visited. This research protocol is composed by a set of questions which, as if it were an interview, I bring with me the research field and protocolally I interrogate each of the ten shared mobility service firms focus of study. Such questions have been written with the theory and research focus in mind, commencing the research in search of answers to first, some general questions regarding the nature of the offering, the customers segments (identifying gains pains and customer jobs) and the primary stakeholders that are addressed to in the value proposals. Then a set of more "theoretically-focused" question follow by looking for sustainability related value qualities and resource efficiency related strategies (Bocken, N. M. P., Short, Rana, & Evans, 2014; Bocken, N. M. P. et al., 2016) that may be involved in the value creating and delivery process of these business models. Ultimately, the relationships and references to traditional mobility systems and mass transit systems have been searched for in order to observe how these value propositions interact with other already existing value offerings in the urban mobility environment.

The questions that guide the systematic protocol are included in the *Appendix A* at the end of this document. The reader should note that the material gathered that give answer to question number 5 has been never used in this study and therefore omitted for its analysis, as the theoretical concepts that this question involves surpasses both the set research scope and theoretical framework.

3.2.2. Material collection: targeting platforms and setting online boundaries

The material collection and data gathering process is guided by the introduced systematic protocol which apart from the set of questions that feature in Appendix A, it indicates the type of online platforms that would be visited regarding each of the 10 studied firms.

The criteria for the selection of the online platforms respond mainly to the necessary requirements: accessibility, equality and officiality. Data access has been the main issue during the development of this study as, prior to the development of a netnographic study other methods were considered, however the lack of access to data sources has led me to drive towards the online platforms where firms operate. Thus, only those open to the public and restriction-less online platforms and web pages where selected for this study. The second aspect that has been considered is equality in terms having access to the same 'type' of online sites regardless the firm that was being studied. This requirement made possible to have access to the same number of online platforms for all 10 studied companies. The last criterium for data gathering is officiality, meaning that all the selected online sites needed to be managed by the companies themselves. This requirement is fundamental as this study targets shared mobility firms' own discourses around their propositions of value. Therefore, any online site that was managed by third parties was discarded for this study. The introduced criteria for gathering material resulted in targeting the following Internet platforms:

- The *firm's official webpage*. Regarding firm's official webpages, all sources of information that are linked to the core webpage as been taken into account, as soon as it kept the official authorship of the company itself. In this regard, those firms whose webpages also feature (or provide the link to) the company's official blogs have been used as a data source, although it must be noted that not all the studied companies include an updated corporative blog, neither all their official webpages are developed in the same extent, finding evident quantitative differences in between small and big firms. E.g. a company such as Uber has a wide webpage with a great source of link and available information, while Move About's webpage is rather small, with few links to navigate through.
- The firm's *official Facebook page*. All the studied firms publish content in their respective official Facebook sites (through, with variable frequency). The boundary set for gathering data from their publication was put on date 01/01/2018 till July 2018, during when the data gathering was taking place.
- The firm's *official Twitter account*. The limits for gathering data from firms' publications on Twitter is the same as the one that applies to Facebook. Considered that the re-tweet feature in Twitter is one of the most essential, those retweets made by the companies' official account where taken into account during the data gathering process.
- The firm's official YouTube channel. The same date publication limiting criterium as to the other social networks also applies to the studied firms' official publications YouTube.

Regarding the online information sources whose data was available in different languages, the English language has been prioritised. This is particularly relevant in the case of webpages. It is worth to mention that those studies companies with international projection or which are already operating in several continents provide various language translations and, interestingly enough, not all the "webpage version" in a particular language provide the same amount of information. At the same time, choosing English as the main language to follow has been an advantage to getting access to the greatest sources of information – such

as blogs, tweets, Facebooks posts, and certain interesting webpage links – mainly available in English. There have been only three exceptions to this general trend: Mobike, BiciMAD and Move About. Mobike and BiciMAD are companies which only operate in Spain, having an scarce source of information written in English, regarding their webpages. In these two cases, the research has focused on the Spanish sources mainly, which have been translated to English during the data gathering and transcription stages. This has not created any issues as Spanish is my mother tongue. Ultimately, Move About is a Swedish company which only operates in some Nordic countries (being Sweden and Norway its greatest markets), so most of its available online platforms provide information written in Swedish, although there exist an English version of its webpage which does not reflect the actual reality of the official Swedish version. In the case of Move About the official Swedish platforms have been put into main focus, being translated into English during the transcription process.

Ultimately, the netnographic research process has been very productive, producing approximately 70 pages of raw data which give answer to the 5 questions of protocol made to the studied 10 shared mobility service firms throughout the 4 selected online platforms explained above.

3.2.3. Reasons for the use of netnography in the study of shared mobility industry's value propositions

Netnography is a very flexible method that enables the researcher gathering data from many sources in the Internet-scape. In this especial case in which I am studying share mobility service firm's value propositions, this method allows to dive in the many online channels and platforms in which these companies show themselves, qualify their service offerings and propose value to their customers and selected stakeholders.

Another good reason for developing netnographic research lies on the technological development or 'technological revolution' (Finger et al., 2017) that has allowed the sharing economy to grow throughout online platforms. Thanks to this development, many of the shared mobility business models focus of this study would never exist, thus researching those online platforms is, in this case, reaching the actual location and commercial storefront of these firms.

3.2.4. Empirical and Methodological Limitations

The empirical research process started with actually 11 firms focus of study and one additional main question was initially introduced in the research protocol – this main question, and other related sub-questions aimed to find out the socio-economic impact that these shared mobility firms may propose as sustainable contributions to their geographic markets (cities or regions of influence).

This research focus together with the firm Whim, whose main service value proposition is a mobility-as-a-service software, where discarded after the data was gathered.

The amount of data gathered after the completion of the field netnographic research was way higher that I could manage for a paper of this characteristics. After the research I was managing around 80 pages of raw data. During the analysis process I have had to prioritise and, therefore 'sacrifice' the use of certain data in order to first, being able to answer the research questions properly without exceeding the aim proposed and for keeping a manageable analysis chapter according to the goals and boundaries imposed in a master's level thesis.

- 11 companies (Whim, MaaS)
- More questions made than finally have been taken into account.

The development of netnographic research as the methodological tool allows the researcher to obtain a picture of a phenomena that occurs during a very concrete time. The fast-paced development and evolution of online sites and social media pages that business organization manage change in the blink of an eye, with the possibility that their messages, value offering, and even the very business models may change. Therefore, I would like to aware the reader that the included links to web pages and other social media sites may be outdated or not functioning anymore as their content and links may have been changed after this study has taken place.

3.2.5. Pilot study: semi-structured interview

Before the development of the actual empirical netnographic study, I have guided a pilot study via the development of a single semi-structured interview with one of the selected shared mobility service firms which is part of the research sample. The one hour-long interview made to the Marketing Director of Move About, an electric carsharing service firm, attempted to obtain a generic view of the firm's business model, not only inquiring about the firm's value propositions and sustainability positioning but also focusing on concrete customers and stakeholders relationships and value offerings to each group, as well as looking at the firm's own understanding of the shared mobility service industry, their actual position in it and their future vision.

This pilot study has given me insights that have led me to narrow down the research focus into a more concrete value proposition perspective. This pre-study also showed me that carsharing service are part of a greater developing field, the shared mobility services, which led me to comprehend the interest in researching the different shared mobility service offerings in this field and their involved value propositions, especially regarding their resource efficiency and sustainability potentials.

I would like to stress that the developed semi-structured interview and the data obtained via this method has not been used as a complementary method to netnography, but as a method employed in an empirical research preliminary state. Therefore, the data obtained via this method is not used for analytical purposes but only as reflective tools which have an impact on the posteriorly chosen theoretical framework and research field selection. The information obtained via this method, however, is used for gaining insights on Move About's business model from the perspective of its Marketing Director.

From an academic perspective, keeping an ethical position on the treatment of what I consider "advantageous information" regarding the data obtained in the interview with Move About keeps a balanced reliability of the other shared mobility service firms' data which has been obtained via netnographic research. By not using this "advantageous information" for analytical purposes I am consciously giving the opportunity to all studied firms to "express themselves" in the Internet realm, and therefore, not favouring in any extent the firm that personally granted me an interview.

3.3. Selection of Shared Mobility Service firms

The scope of the present study is limited to the shared mobility service sector, which rapid development has led to the emergence of a myriad of shared mobility business models (see e.g. (Cohen & Kietzmann, 2014; Shaheen, 2018; Shared-Use Mobility Center, 2015). Among the multiple existing firms I could have been able to choose, I have chosen ten relevant heterogeneous examples which are the following:

- *Move About* (http://www.moveabout.se/) and *Zipcar* (https://www.zipcar.com/) as two cases of electric and fuel-based carsharing business models respectively;

- *Santander Cycles* (https://tfl.gov.uk/modes/cycling/santander-cycles), *Mobike* (https://mobike.com/global/) and *BiciMAD* (https://www.bicimad.com/) as three differentiated bikesharing business models;
- *Muving* (https://muving.com/) as a single case of electric scootersharing;
- *Uber* (https://www.uber.com/se/en/) and *Lyft* (https://www.lyft.com/) as two of the most relevant and popular ridesharing schemes worldwide;
- *And UberPOOL* (https://www.uber.com/es-US/ride/uberpool/) and *Blablacar* (https://www.blablacar.co.uk/) as two carpooling actors with different business approaches.

Heterogeneity is also obtained in terms of which are the main sources of energy employed for fuelling their vehicles: there are fossil fuelled-based mobility schemes in the case of Zipcar, Uber, Lyft, UberPOOL and Blablacar, while Move About, BiciMAD and Muving only use electric vehicles for supplying shared mobility. In the case of Santander Cycles and Mobike, they offer traditional bike fleets. All the chosen shared mobility firms are established businesses with several years (and even decades) of activity. In most of the cases firms like Zipcar, Mobike, Uber and Blablacar operate in an international level, reaching a wide variety of markets geographically. On the other hand, some others operate either in particular markets like MoveAbout (Sweden, Norway, Denmark and Germany), Lyft (USA and Canada) and Muving (Spain and USA), while others schemes only operate in a local level, which are the cases of Santander Cycles (London) and BiciMAD (Madrid). It is also relevant to highlight that the locally operating bikesharing schemes, Santander Cycles and BiciMAD, are publicly managed by local institutions and defined as public transportation (Transport for London (https://tfl.gov.uk/) and Municipal Transport Company of Madrid (https://www.emtmadrid.es/Home) respectably), while the rest of the chosen shared mobility schemes are privately managed.

3.3.1. Requirements and pre-research set filters

Further requirements prior to the selection of the studied firms in the shared mobility industry is that all the studied firms must enable an online platform, an app or other short of virtual platform as channels that provide the tools and enable the customer to gain access to shared mobility. The development of new business models in the shared economy includes the development of new ICTs as a fundamental enabler of innovation of new ways of proposing, creating, delivering and capturing value, being shared mobility a good example of this new business models eruption phenomenon (Ferrero et al., 2018).

3.3.2. Presentation of the studied firms

Move About – carsharing services

Move About is "a leader in electric car pools and optimization of vehicle fleets" which offers "smooth and cost-effective personal mobility that is truly sustainable and meets all environmental goals, with the least possible use of energy, production resources and public space" (Move About, E.1)). The firm's mission is to provide "*a sustainable multimodal electric transport or combined electric transport"* (U. Jakobsson, personal communication, March 26, 2018) to organizations, municipalities and individuals, by mainly providing electric carsharing fleets, linking them with delivered electric bicycles pools enabling multimodal mobility with other public transportations systems.

Zipcar – carsharing services

Zipcar asserts to be "the world's leading car-sharing network". The firms provides "on-demand access to cars by the hour or the day in cities and campuses around the globe" (Zipcar, I.1). Zipcar sharing scheme is defined as 'one-way' or 'point-to-point carsharing'

which allows customers to pick up a vehicle at one location and drop it off at another (SUMC, 2016).The company's mission is "to enable simple and responsible urban living—a future filled with more car-sharing members than car owners in major cities across the globe" and this major goal is aimed to be fulfilled by "delivering on-demand vehicles that support environmental sustainability", "helping members save time, hassle and money in their everyday transportation" and by "freeing up city space through strategies that consider campus, urban, residential, commercial and city planning needs" (Zipcar, I.1).

Santander Cycles – bikesharing services

Santander cycles is a public bike-sharing scheme which supplies bike mobility by supplying a fleet of bikes available in specific docking stations across the city of London. Being a 'dock-based system bikesharing scheme, it allows users to pick up and return bikes from IT-enabled docks or stations located throughout a service area (SUMC, 2016). Regular users of the scheme can register on the TfL website and buy access for 24 hours, 7 days, or one year. Users are then posted a key to operate the docking stations; keys cost £3, and up to four can be registered under a single account. The key allows a cycle to be released from the docking station (Santander Cycles, G.1).

Mobike – bikesharing services

Mobike is the world's first and largest cashless and station-free bike sharing platform. Its mission is to bring more bikes to more cities, using its innovative technology to make cycling the most convenient and environmentally friendly transport choice for urban residents. Using specially designed bikes equipped with GPS and proprietary smart-lock technology, Mobike enables users of its smartphone app to find a bike near them, reserve and unlock it, then complete their trip by simply closing the lock anywhere regular bike parking is allowed. The company officially launched its service in Shanghai in April 2016, and in just under two years, has expanded the service to over 200 cities in 13 countries globally (Mobike, D.1).

BiciMAD – e-bikesharing services

BiciMAD is a public bikesahring system for the city of Madrid, a service provided by 100% of electric bicycles, handy, easy to use and ecological. The aim of BiciMAD is to provide an alternative element of clean and healthy transport to the citizen and encourage the use of bicycles in the city. The system consists of 2,028 bicycles, 4,116 locking anchors and 165 stations (BiciMAD, A.1).

Muving – e-scootersharing services

Muving is a dock-less electric schooter sharing scheme which that enables users to access to an electric scooter. By sing GPS technology users can track the location of the e-schooters via the app in a smart device (Muving, F.1). Muving is presented as the first European motosharing company by number of cities and fleet crosses the pond to change mobility and make it sustainable.

Uber - Ridesourcing

Uber's business model is framed within Ridesourcing or Transportation Network Companies (TNCs). Ridesourcing makes use of online platforms to connect passengers with drivers who use personal, non-commercial, vehicles (SUMC, 2016). Uber's mission is to bring transportation for everyone, everywhere. It was founded in 2009 to solve an important problem: how do you get a ride at the push of a button?

Lyft - Ridesourcing

Lyft is a ridesourcing mobility company. It was founded in June 2012 by Logan Green and John Zimmer to improve people's lives with the world's best transportation. Lyft is the fastest growing rideshare company in the U.S. and is available to 95 percent of the US population. Lyft's mission is to improve people's lives with the world's best transportation. As we become an even larger part of the communities we serve — we now operate in 95% of the US and parts of Canada — we're energized by the ability to further deliver on this mission (Lyft, C.1).

UberPOOL – Ride-splitting services

UberPOOL is Uber's carpooling scheme and part of the overall Uber's shared mobility offering. UberPOOL's business models can be defined as ride-splitting or real-time or dynamic ridesharing, which are a specific type of TNCs which allow drivers to add additional passengers to a trip in real-time and passengers split the cost of the trip along the way (SUMC, 2016).

Blablacar – carpooling services

BlaBlaCar is the world's leading long-distance carpooling platform – a global, trusted community of 60 million drivers and passengers in 22 countries. The site and mobile apps connect people looking to travel long distances with drivers going the same way, so they can travel together and share the cost. Each passenger makes a fair contribution for their seat, and drivers cover their driving costs but do not make a profit. The platform is engineered to create a secure, trust-based community with declared identities and full member profiles (Blablacar, B.1).

4. ANALYSIS & EMPIRICAL FINDINGS

This chapter carries out the analytical of the ten selected shared mobility service firms, focusing on their delivered value propositions via these firms' official online platforms: the webpage (including corporative blogs, if available), the Facebook page, Twitter account and YouTube channel. The sections are organised as follows: section 4.1. analyses shared mobility business models value proposals based on the primary technological, organizational, infrastructural and stakeholder business model enablers; section 4.2. analyses the two-fold strategical approach of shared mobility business models towards mass-transit mobility offerings; section 4.3. develops an analysis in three parts regarding shared mobility business models positioning towards private car ownership and consumption; lastly, 4.4. summarises all the identified 'aggregated value propositions' containing the fundamental value qualities that embed the value propositions of the studied ten shared mobility business models.

4.1. Delivering superior value via customer-focused shared mobility service offerings

The present section can be resumed in that shared mobility services firms aim to create and deliver utility value to its customers by proposing *convenient, accessible and reliable* shared mobility services, which are the result of the combination products, services, systems and online platforms that enable the proper fulfilments of their their mobility needs.

In this section contains four differentiated subsections which show how shared mobility service firms qualify their consumer-focused value propositions. Firstly, section 4.1.1 exposes the roles of ICTs have within shared mobility business model in order to create and deliver value to the customer. Then, section 4.1.2 shows how shared mobility business models strategically enable accessibility to their proposed service offerings. Lastly, section 4.1.4 Focuses on the value propositions that ridesourcing and ridesharing business models particularly deliver to the figure of the 'driver', who for these business models is a key partner of their value chain, who most likely owns the vehicle and wo performs the 'job' of delivering the trips to users, also known as 'riders'.

4.1.1. The multiple value creating mechanisms of ICTs in Shared Mobility business model

Shared mobility aims to break with the paradigm that convenient mobility is only related with privet mobility. This is why shared mobility service firms make a strong effort in qualifying their services and simple, easy-to-use and convenient**.** The role that ICTs play in the creation and delivery of value in shared mobility service schemes is central. Shared mobility service business models commonly enable online platforms and apps as principal channels through which users book the use or performance of their demanded mobility services, pay for them and even interact with the service provider. Even though the integration of disruptive technologies (Lacy et al., 2014) in business models' value creation mechanisms is becoming a common practice for businesses, shared mobility service firms are in need to set clear messages about how easy to use their services are in order to attract users to their schemes.

Examples of the prior are found by observing how these firms qualify their value offerings, reinforcing the words 'easy' an 'simple', while adding information and instructions about how to use their bikesharing schemes.

> *"Using our electric scooter is very easy, you simply have to locate the nearest Muving in our app and book it."* (Muving, F.2)

"Convenient & Simple. After downloading the App and registering, simply scan the QR code on the bike and ride away. Simply close the lock once you've parked in a bicycle parking area!" (Mobike, D.2)

"Once arrived to the scooter, use the app to star the trip, disconnect the helmets from the trunk and enjoy the ride." (Muving, F.2).

"Tap a button, get a ride. Choose your ride and set your location. You'll see your driver's picture and vehicle details and can track their arrival on the map." (Uber, H.1)

"Find a ride. Just say where you're heading, where you're leaving from and when. Then pick a ride that works for you! If you need more info, you can message drivers before booking." (Blablacar, B.2)

Simplicity is not only highlighted in terms of access and use of the service but also for the payment process is also qualified as simple or 'seamless':

"Easiest way around. One tap and a car comes directly to you. Hop in—your driver knows exactly where to go. And when you get there, just step out. Payment is completely seamless." (Uber, H.2)

"Book and pay online. Tap book and pay for your seat. Once you do, you'll have the driver's phone number to get in touch." (Blablacar, B.2)

"Hop out. Simply exit the car when you reach your destination. We'll automatically charge the fare to the payment method you have on file. If your trip was 5 stars, consider tipping your driver in the app after your trip." (Uber, H.3)

Additionally, the implementation of ICTs and smart devices as a necessary platforms and tools that enable the access to shared mobility service is also qualified as convenient, given the immediacy and seamless consumption process that is all gathered into a online booking platform, an app or smart device enabled in a docking station. This convenience quality power by technology can be delivered in different ways:

"BiciMAD stands out for its use of Information and Communication Technologies for improving user experience. […] you can instantly sign up via credit or debit cards" – translated from Spanish (BiciMAD, A.2)

"The Santander Cycles app sends a release code direct to your smartphone, letting you skip past the terminal and get on your bike quicker […]." (Santander Cycles, G.2)

"You can hire a bike from as little as £2. Simply *go to any docking station with your bank card and touch the screen to get started. There's no need to book - hire a bike, ride it where you like, then return it to any docking station."* (Santander Cycles, G.3)

In this extent, shared mobility service firms make use their ICT through which propose additional value for the user. A common feature is to provide information to the user about the availability of shared-use vehicles. Indeed, mobility sharing schemes, in which a limited stock of vehicles are constantly used and moved around a city by multiple different users, require from the necessary innovative technology to track where those vehicles so a user can access them and benefit from the promised value.

"Multiplatform interactivity or information access from its own base, web page and mobile devices: real-time information on available bikes and stations […]." (BiciMAD, A.2)

"Features include [regarding the Santander Cycles app]: docking station information; live bike and space availability; an interactive map; see recent journeys and charges. You can also save your favourite docking stations and search by Tube and train stations, London landmarks and street name." (Santander Cycles, G.4)

Moreover, technology plays an essential role in delivering reliable mobility services that both are safe and potential users can trust. Interestingly, ridesourcing business models, such as Uber and Lyft and carpooling platforms, such as Blablacar and UberPOOL, make special emphasis on verifying their members' information to make sure that they are reliable members – both riders and drivers – of their sharing schemes. Profile checks are a common resource that shared mobility service firms use in order to both ensure that all members are eligible for becoming part of a trustworthy community. These measures are both required to riders and drivers alike and are used as a fundamental value-creating tool that enable service reliability and trust among members.

> *"Safety first. Lyft drivers undergo two types of background checks and give over 1 million rides every single day — that's why the average Lyft ride is rated 4.8 out of 5 stars."* (Lyft, C.2)

> *"We take the time to get to know our members. All profiles and ratings are checked. IDs are properly verified. So you know who you're travelling with."* (Blablacar, B. 3)

> *"All potential drivers in the US must complete a screening before becoming an Uber driver-partner, and current drivers continue to be vetted for criminal offenses."* (Uber, H.4)

These shared mobility platforms take advantage of their enabling technology for ensuring that trust is kept and reinforced among their users, drivers and riders alike. Ratings are, among other tools for obtaining user experience feedback, the one that most operationalizes the 'trust and safety' proposition:

> *"2-way ratings. Your feedback matters. Low-rated trips are logged, and users may be removed to protect the Uber community."* (Uber, G.5)

> *"Two-way Ratings. You've got the power. Passengers and drivers rate each other after every ride. If you rate someone 3 stars or below, you'll never be matched with them again. Lyft takes all user ratings and driver feedback very seriously."* (Lyft, C.3)

> *"Trust is the key. When we increase our Experience Level —by leaving ratings and completing our BlaBlaCar profile—we create more trust in the BlaBlaCar community."* (Blablacar, B.4)

In this extent, safety is not only ensured by the experience feedback and ratings that users of shared mobility platforms deliver, but firms like Blablacar, for instance, encourage that users to share, check and make sure that their next trip is going to be as reliable as possible, thus minimizing any potential risks. For ensuring this Blablacar takes advantage of the seamless connection of other social media platforms for encouraging that its members become active checkers of the carpooling community for their own and others' security. An example of these is given by Blablacar in its webpage:

> *"Check out their ratings. See what others say about them, and benefit from the experience of other members when choosing who to travel with. Find out more about them. Check out their preferences and mini bio so you know all about who you'll be travelling with. Choose who you travel with. When you check out other members' profiles you can see how many Facebook friends and LinkedIn connections they have. You can also see who are the community's leading ridesharers thanks to their experience level."* (Blablacar, B.5)

Shared mobility service firms also provide tools for both drivers and riders which aim to give them 'peace of mind, wherever they go'. Once more their app-based technology provides additional features and tools that these firm deliver, such as "safety toolkits" (Uber, H.6), *"secure messaging systems"* (Blablacar, B.5) *"GPS tracking"* technology (Uber, H.5.) and

a *"Critical Response Line"* in case of accident (Lyft, C.3), among other existing tools and services.

In conclusion of this section, and based on the previous analysis, I resume the first three principle value propositions and their embedded value creation logic of the studied shared mobility service firms:

> ***Aggregate Value Proposition #1:*** *Shared mobility service firms deliver an easy and convenient* (gains) *shared mobility service systems (from booking, through vehicle/mobility access until use/mobility performance)* (products/services) *enabled by ICTs* (gain creators), *which play a fundamental role in creating and delivering value for and by users.*
>
> ***Aggregate Value Proposition #2:*** *Shared mobility services firms facilitate an easy and convenient payment process* (gains) *enabled by ICTs* (gain creators), *which play, once more, a fundamental role in capturing value from users.*
>
> ***Aggregate Value Proposition #3:*** *Shared mobility service firms deliver reliable, safe and trustworthy* (pain relivers) *mobility services* (products/services) *enabled by the integration of ICTs in business models* (gain creators). *In the case of P2P shared mobility platforms, members' role* (drivers and rides alike) *is essential for co-creating, maintaining and controlling a safe and trustworthy shared mobility network/system* (pain relivers), which gains such values *based on their shared experience, ratings and feedback* (customer jobs).

4.1.2. To enable and ease boundless access to shared mobility

Shared mobility service firms propose their mobility services as easily accessible, enabling vehicles docks or fleets in multiple locations in e.g. a city. This strategy is commonly found in vehicle-sharing B2C business models such as Mobike, BiciMAD, Santander Cycles or Muving. This geographical expansion is focused as a value-creating quality which both enables the customer's ability to access to a particular shared mobility scheme and widens the customer's capacity to choose from and reach multiple locations and destinations.

> *"Mobike takes you there! Thousands of bikes available around you. End your ride in any bicycle parking space, near to your destination!"* (Mobike, D.2)
>
> *"There is one station every 300 meters, choose your closest one" – translated from Spanish.* (BiciMAD, A3)
>
> *"There are more than 11,500 bikes at over 750 docking stations across London."* (Santander Cycles, G.5)
>
> *"On holiday move around with Muving: one single app, different cities: #Muvingin11cities #SummerwithMuving #Alicante #Barcelona #Cadiz #Cordoba #Granada #Madrid #Malaga #Murcia #Sevilla #Valencia #Zaragoza" – translated from Spanish* (Muving, F.3)

Those shared mobility service business models also qualify their offered mobility services as geographically accessible. In this case value is proposed thanks to both a wide geographical coverage of a particular market and thanks to having an high and active number of users who create value to each other by demanding and offering shared trips:

> *"Rides on tap - With 95% coverage across the US, you can be on your way in just a few minutes."* (Lyft, C.2)
>
> *"[…] we enable 35 million members of our community to share their car rides across three continents […]"* (Blablacar, B.6)

> *"Go literally anywhere. From anywhere. Smart. With access to millions of journeys, you can quickly find people nearby travelling your way."* (Blablacar, B.3)

Additionally, some of these firms not only via enable accessibility by locating their vehicle fleets in multiple key geographical locations but also enable 24/7-time accessibility for users, communicating that their service are available whenever and wherever you are.

> *"Locations near you. Zipcars live in cities, airports, and on campuses around the world. Your Zipcard unlocks 'em all for 24/7 access to clean, comfy rides. View Zipcars near you"* (Zipcar, I.2)

> *"Mobike is changing transport for good with a network of more than 8 million bikes. You can pretty much find one walking down the street, looking down your window or checking your phone. […] Have the power to go where you want when you want. 24 hours a day every day all over the world"* (Mobike, D.3).

> *"Always on, always available. No phone calls to make, no pick-ups to schedule. With 24/7 availability, request a ride any time of day, any day of the year." "Uber is in San Francisco and 632 other cities worldwide"* (Uber, H.1)

***Aggregate Value Proposition #4**: Shared mobility services firms deliver easily accessible* (gains) *shared mobility services* (products/services) *by strategically distributing their vehicle fleets throughout cities and nearby public transport stations* (gain creators)*, by enabling shared mobility platforms of millions of members (ridesharers and drivers) who ultimately grant delivering ubiquitous shared trips* (gain creators)*, and by enabling the access and use of their services in a 24/7 time frame* (gain creators).

4.1.3. Empower yourself: attracting drivers to shared mobility platforms – the case of B2C ridesourcing and ridesharing business models

As it has been already highlighted in the beginning of this analysis chapter, ridesourcing business models require the participation of the figure of the 'driver' in order to deliver mobility services to users. Indeed, these drivers and their owned private vehicles are the main 'material' source of resources in these kind of business models' supply chain (Cohen & Kietzmann, 2014). Given the main role that drivers play within these shared mobility business models, some shared mobility service firms deliver custom driver-focused value propositions.

The main driver-focused value propositions that the studied ridesourcing firms, Uber and Lyft, deliver are based on attracting or convincing regular people to become fundamental partners for the creation and delivery of value during the service delivery phase. The value chain of these ridesourcing business models fundamentally is supported by the willingness of millions of 'anonymous' people to drive their own (or rented) cars for delivering point-to-point 'rides' to other users. This section aims to portray how these firms qualify their driver-focused value propositions for attracting and keeping drivers to their shared mobility schemes.

First of all, it is interesting that some of the main value qualities related to the 'rider's job' are the potential capacity of improving the driver's life and to fulfil individuals' own life goals. This means that being a driver is not presented as a goal for obtaining additional sources of income but is qualified as the *mean* through which individuals can achieve further and more important goals in their lives, being these sharing mobility schemes the enablers and providers of such subjective values:

"Drive when you want. Make what you need. Driving with Uber is flexible and rewarding, helping drivers meet their career and financial goals." (Uber, H.2)

"Work that puts you first. Drive when you want, make what you need. Set your own schedule. You can drive with Uber anytime, day or night, 365 days a year. When you drive is always up to you, so it never interferes with the important things in your life." (Uber, H.7)

"Drive toward what matters to you. Whether you want to pay off debt, take the family on vacation, or ditch your 9-to-5, we'll help you get there." (Lyft, C.4)

The previous set of quotes appeal to the driver as an individual with its own presents needs and goals, as well as future wishes and plans. Thus, the studied ridesourcing business models qualify their sharing platforms as 'tools' through which people can achieve their personal goals, while keeping their independency and capacity to self-manage their driving jobs according to their daily-life needs. The sum of value qualities such as a convenience, flexibility, profitability and self-management that ridesourcing firms propose converges into one single message used by both firms: 'be/become your own boss'. The following quotes exemplify how Uber and Lyft propose value through this major argument:

"Set up your own work schedule. Drive just when you want. Forget about bosses and offices. With Uber you can start and finish driving when you want because you are in charge." – translated from Spanish. (Uber, H.8)

"DRIVE TOWARD WHAT MATTERS. Want to be your own boss? Start today." (Lyft, C.5)

Be your own boss - The only person you answer to is you. Control where, how, and when you want to earn — whether that's on your way to the office, while your daughter's at school, or after night classes." (Lyft, C.4)

The economic issue is definitely highlighted by both Uber and Lyft in their driver-focused value propositions, which qualify the driving activity as a 'reliable' and 'easy' way of obtaining earnings.

"Make more at every turn. Trip fares start with a base amount, then increase with time and distance. And when demand is higher than normal, drivers make more". (Uber, H.7)

"Grab the wheel and start earning." (Lyft, C.6)

"Reliable earnings - The Lyft Driver app and its features help you make money you can depend on. When you're ready, cash out instantly." (Lyft, C.5)

"Money's just the start - Earning tools, access to career coaches, education resources, and tax support give you the freedom to reach your goals — both big and small. (Lyft, C.4)

Making both the requirement for becoming a driver and the 'job' itself looking simple is another of the value proposing strategies that ridesourcing and ridesharing platforms propose to their drivers. In this case, driving for these shared platforms require a correct use of their booking technology, which in the case of Uber and Lyft is enables by apps for smart devices. Therefore, for attracting new drivers to their schemes, these firms propose simplicity in all stages of the process to become and being a driver:

"About the app. Designed just for you. When you want to start make money, just open the app and you will receive the next trip request. You will receive all information about the rider and directions to get to the pickup and destination. After the trip is finished you will receive the next soon. And when you're ready to get off the road, just press go offline." (Uber, H.7)

"A few necessities - You'll need to be at least 21 and have a smartphone (bonus points for good music). Your city will also have a few requirements." (Lyft, C.5)

To summarize, Lyft and Uber propose drivers convenient and independency-enabling 'jobs' and the figure of the 'driver' is qualified as a freelance position that aims to deliver a superior value to the individual as if he or she was 'its own boss'. Thus, the proposed values such as flexibility, convenience and economically variable income would be a direct consequence of the 'driver's' capacity to self-manage its own driving activity, enhancing the figure of the driver as an empowered individual. The previous analysis can be configured in the following value proposition:

Aggregate Value Proposition #5: *P2P Shared mobility platforms such as ridesharing and ridesourcing schemes* (product/services) *offer a convenient, simple and self-manageable 'job'* (gain creator) *to individuals who need* (pains) *an easy and reliable source of income which may enable both fulfilling driver's goals and simultaneously provide a sense of empowerment to the driver* (gains). *In exchange, drivers must deliver shared mobility services to users via the use of ICTs and by means of their own private vehicle* (driver's jobs).

4.2. Different approaches for filling the gap of Public Transit Systems

Shared mobility service systems have identified the "pains" that users of public transportation suffer when the only alternative is the often expensive and inconvenient private vehicle. Thus, these firms deliver a set of value propositions that aim to resolve these consumption gaps by providing more convenient and customer-oriented value creating logics. Simultaneously, these firms also understand the key role of public transit systems (Cohen & Kietzmann, 2014) – here referring to short- (e.g. underground lines), medium- (e.g. regional bus lines) and long-distance (e.g. inter cities train lines) mass public transportation – as key systems in the goal of delivering mass mobility to the wider population. Therefore, shared mobility service firms aim to fill the existing market gaps within the so called 'first mile, last mile' problem/challenge, (Cohen & Kietzmann, 2014; Finger et al., 2017) aiming to deliver transit solutions in combination and cooperation with other local public transit service systems.

4.2.1 Proposing and Enhancing Multimodality for delivering value

I have identified that shared mobility service firms make efforts in integrating their sharing services with other public transit systems in a local perspective. These efforts are part of an overall vision of these firms for making cities more sustainable and less car-dependent cities. The following quotes exemplify that this positioning is transversal to different shared mobility business models:

"Move About is part of a sustainable urban mobility movement that compliments public transportation, bike share programs and other initiatives […]". "Our vision is to be involved in creating a truly sustainable society by linking electric car pools driven by locally produced and renewable energy with trains, fossil-free public transport and bicycle pools." – translated from Swedish. (Move About, E.1)

"At Lyft, we envision a world in which cities are not built around parking lots and roads, but are reimagined to center around our communities. And we believe that partnering with public transit agencies is critical to this vision. Recognizing the role public transit plays as a backbone to mobility […]" (Lyft, C.7)

It is noticeable the interest of Uber and Lift to develop close partnerships with public transit agencies in order to offer to their customers a holistic offering of mixed transportation, positioning their ridesourcing mobility services as "first and last-mile solutions". These ridesourceing firms opt for offering reliable ICT systems based on app technology which would create the following forms of value:

> *"Recognizing the role public transit plays as a backbone to mobility we are thrilled to introduce mixed transportation trip planning capabilities in our app, providing people more options than ever to get around. Riders will be able to seamlessly request a Lyft as a last mile solution at the end of their transit journey, or during hours of congestion."* (Lyft, C.7)

> *"Why integrate the Uber API into transit apps? Because it can help make travel better for everyone. In fact, when multiple options are connected, riders can bring multiple modes of transportation—including public transit—into their commutes. Together, we hope to bridge the gaps in transit systems by delivering certainty and reliability to our riders' end-to-end journeys. These solutions marry the strengths of public transit—the transportation backbone of our cities—with the convenience and reliability of Uber's technology, getting riders to and from transit stops to reach their ultimate destination."* (Uber, H.9)

Thus, the strategies of integrating shared mobility services into other forms of transit apps require addressing value propositions to both users and to other potential partners, highlighting the existing value creating opportunities that arise from the combination of shared and public transit systems:

> *"Four reasons Uber's a good partner for third-party transit apps and transit agencies: Fills the gaps in existing public transit service. Provides access to underserved communities. Alleviates the demand for parking. Reduces costs of underutilized routes or services".* (Uber, H.9)

Multimodality and first- and end-mile solutions are qualified as efficient and more convenient solutions for multiple parties involved in consuming and providing mobility in cities:

> *"This system is offered to all those who want to move around the city centre, complementing the car or public transport." – translated from Spanish.* (BiciMAD, A.4)

> *"EMT is constantly improving its services and work for fostering multimodality (e.g. #MaasMadrid) so public transport becomes more efficient and attractive, says @Transxte en #movilidadEE" – Translated from Spanish.* (BiciMAD, A.5)

Multimodal solutions inhabit a strong 'local' consciousness, proposed as potentially improving the social and economic development of local communities:

> *"Did you know #cycling helps improve accessibility to more jobs? "How cycling improves cities job accessibility (Wahington example). Walk + Public Trasport +Walk: 468.140 jobs. Bike + Public Transport + Bike: 638.922 jobs – Job opportunities accessible within a 30-minute commute from a single sample point, using walking and biking as the first/last-mile option."* (Mobike, D.4)

Therefore, shared mobility services in combination with public transit systems deliver the following aggregated value proposition:

Aggregate Value Proposition #6: *Shared mobility services* (products/services) *complement mass transit systems by delivering shared mobility solutions* (gain creators) *for the so called 'first-mile, last mile' problem* (pains) *in convenient and reliable ways* (pain relivers).

Aggregate Value Proposition #7: *The combined use* (gain creators) *of shared mobility and public transit systems* (products/services) *are a sustainable way of fulfilling personal mobility needs* (gains), *with the potential to decrease environmental depletion and foster local economic growth* (superior gains).

4.2.2 Shared Mobility Systems as an alternative to Public Transit Systems

On the other hand, certain shared mobility service firms opt for a value proposition strategy that shows some of the 'market failures' or service gaps of the public transit systems in order to address how their proposed shared mobility systems are able to solve these existing consumption-related problems.

Some shared mobility systems highlight the inconveniences of accessing and consuming public transit services both short and long-distance transit. Short distant public transit systems are qualified for its limited availability, its consumptions-related complexities due to its crowded and overbooked vehicles and time waiting inconveniences. The proposed value, therefore, is that shared mobility services help people to avoid these complexities, providing more convenient and quick mobility solutions:

> *'What's Mobike?' – Extracts of quotes from a video clip: "Going home is no longer a hassle when you miss the last bus". "With Mobike I never need to rush to the bus in the morning". "Everywhere is here". "Now is like I have a car".* (Mobike, D.5)

> *"#MobikeMovement. No more lugging around your personal bicycle or squeezing in transfer buses. Just Mobike to your destination!"* (Mobike, D.5)

> *"Seamless - Get to your exact destination, without the hassle. Carpooling cuts out transfers, queues and the waiting around the station time."* (Blablacar, B.3)

Long-distance public transit systems are also qualified as inconveniently 'tedious and difficult to access. Blablacar in particular highlights the issues related with long-distance traveling a major argument for delivering higher value to its users. The main argument is that long-distance travelling stations are too centralised in cities and other major locations where population in concentrated. Their value proposition, thus, is a decentralised form of shared mobility:

> *"For the millions of people who live outside big city centres, in suburbs or regional towns, long-distance travel is often tedious and difficult to access. Meanwhile, there are cars passing by with empty seats that could offer a near door-to-door experience. Thanks to our new search algorithm, we can make transport connections significantly more local, and give people more freedom and independence than ever before. Our vision is simple: wherever there's a road, there will be a BlaBlaCar." - Nicolas Brusson, CEO of Blablacar.* (Blablacar, B.1)

Thus, Blablacar creates a value proposing discourse based on the limited accessibility of the population to access long-distance traveling: public transport systems are too centralised in city centres and big urban conglomerations. Therefore, it actual primary focus is on providing mobility accessibility solutions to those people with restricted or limited access to centralised transport stations. With this positioning, BlaBlaCar aims to:

> *"Historically, BlaBlaCar encouraged its users to meet at central meeting points to increase the chances of finding a match. As the community grew, so did the granularity of BlaBlaCar's service, with trips departing from over 35,000 points across France on a typical peak weekend. Now, BlaBlaCar will take this a significant step further, optimising its service for the 85% of people that do not live near a central transport hub."* (Blablacar, B.1)

Their enabling technology and their wide number of members around the world become their major source of value creating assets, providing users a more local, convenient and independent mobility system, while providing solutions to the 'first- and last-mile' problem:

> *"[…] to offer a near door-to-door experience" making "transport connections significantly more local, and give people more freedom and independence than ever before."* (Blablacar, B.1)

Based on the previously analysed data the following value propositions are presented:

Aggregate Value Proposition #8: *Shared mobility systems* (products/services) *provide more convenient and less problematic* (gains) *mobility solutions than short-distance mass transit systems* (pains) *thanks to more customer-focused shared mobility offerings* (gain creators).

Aggregate Value Proposition #9: *P2P sharing mobility platforms* (products/services) *offers a decentralised mobility platform* (gain creators) *which delivers a more convenient, accessible and interconnected 'door-to-door' mobility solutions* (gains), *enabled by ITC and a world-wide community* (gain creators), which *provide superior utility to users than the centralized long-distance mass transit systems* (pains).

4.3. Shared Mobility vs Car Ownership

When deepening into the online realm where shared mobility firms deliver propositions of value to its customers and stakeholders, I have identified a major discourse among the delivered proposing of value of shared mobility service firms: car ownership contains multiple disadvantages from a consumption perspective and its source of negative environmental and social outputs. Shared mobility service firms, in a direct and indirect way, commonly generate value propositions which are built upon an straight opposition to car ownership, asserting that shared mobility creates and delivers superior value from the consumer, environmental and social perspectives. The business models – whether if these are product-service systems or sharing platforms – are driven by their potential to substitute or reduce vehicle ownership for vehicle access or mobility service performance (Ratti & Santi, 2017; Shaheen, 2018). It is, thus, necessary is to establish under which arguments and ideas shared mobility service firms create their value propositions in order to contribute to shifting from a traditional linear consumption of mobility based on vehicle ownership to a major service-based consumption of mobility.

4.3.1 All included, cost-effective and trouble-less mobility

Some of the main value propositions of shared mobility service firms focus on the positive outcomes that the customer or user would obtain by shifting from owning a car to sharing it with others. Surely, the ways of presenting major value gains to customers are various and very diverse among shared mobility service firms. This section presents the principal arguments that justify this value proposition: sharing a car is more convenient than owning a car.

First, sharing provides the user all the benefits of using and/or obtaining the result of owning a car without the inconveniences of owning it. This idea is simply put as follows:

"Own the trip, not the car®". (Zipcar, I.3)

"[…] The convenience of a car without having a car." (BlaBlaCar, B.7)

Among this inconveniences, shared mobility service firms provide arguments on the low effectiveness of car ownership in comparison with capability of mobility sharing to deliver cost effective and less problematic value:

"Members use Zipcar as an alternative to the costs and hassles of owning or renting a car. But is Zipcar for you?" (Zipcar, I.4)

"Move About offers complete and hassle-free mobility". "The system also offers significant cost savings compared to taxis or individual vehicle ownership." (Move About, E.2)

Which are those positive outcomes of shifting from car ownership to getting access to shared mobility? Some of the studied firms provide measurable data for quantifying their saving potential. Car ownership is qualified as expensive and inefficient:

"On average, cars are not being used 96% of the time and are the second most expensive asset you own. @Zipcar revolutionizes access > ownership" (Zipcar, I.5)

Shared mobility aims to provide this 'customer pains' buy optimizing the use of shared cars, which are traduced in potential saving for users:

"Lose the car payment. Keep the car. Zipcar members save a potential of $600 each month compared to folks who own and operate their own cars in the city. How much money [and stress] would you save if you never had to shell out for a car payment, insurance premium, oil change or gallon of gas again?" (Zipcar, I.4)

Reduced costs and prices are argued to enable higher economic accessibility to less problematic mobility:

"Riders can save up to 50% while adding only a few minutes of time per trip. With the lower prices, people can move past car ownership, as taking Uber becomes less expensive than using and maintaining a personal vehicle. And that impact on congestion can be powerful." (Uber, H.10)

"Old business = Focused on ownership. Sharing economy focuses on giving access to more resources and assets. What are your thoughts on this? Let us know here! #SXSW #SXSW18 #tech #startup #technology #bikesharing" (Mobike, D.6)

Additionally, convenience and reliability potential of shard mobility services is supported by the proposed overall mobility solutions offerings. In the case of B2C use-oriented shared mobility services, added bundles of service packages are commonly offered such as not having to deal with insurance contracts, filling the oil tank or the vehicle maintenance, among other car ownership-related consumption inconveniences. These value creating services are an integrated part of the whole product-system offering of these firms, qualified as superior creators of convenience for the customers, and enhancers of reliability in terms of safety and trustworthiness. Some examples of the service aspects of their value propositions:

"Fits student budgets. One rate covers gas, insurance, parking and maintenance. So turnkey, it's a no-brainer." (Zipcar, I.6)

"No maintenance or fuel cost & insurance included" (Muving, F.2)

"When you drive with Uber, you get 24/7 driver support and insurance coverage. And all riders are verified with their personal information and phone number, so you'll know who you're picking up and so will we." (Uber, H.7)

On the other hand, P2B2P shared platforms business models such as ridesharing and carpooling firms aim to fill potential safety and trust gaps which customers may encounter every time they share a ride with a random, non-professional driver. These business models, thus, provides insurance which cover the entire trip length aims reduce uncertainty and solve the complexities involved in sharing platforms in which the riders does not have control over the means and the result of such service performance.

> *"Covered. - Really? Free as in nothing to pay? You've got it. We partner with AXA. So your ride's covered from start to finish, absolutely free of charge."* (BlaBlaCar, B.3)

> *"Insurance on every trip. Uber partners with leading companies to help protect you if anything happens."* (Uber, H.11)

> *"Lyft Insurance Protection Plan. Our first-of-its-kind insurance plan provides drivers with additional coverages, from the moment they flip into driver mode until their last passenger of the day is dropped off. Our $1M liability will apply as primary to a driver's personal automobile insurance policy when matched with a passenger."* (Lyft, C.3)

Based on the previous analysis I configure the following aggregated value propositions:

Aggregated Value Proposition #10: *Shared mobility services firms* (products/services) enables more convenient, cost-saving offerings (pain reliver) thanks to optimised on-demand services (gain creators) in comparison with car ownership's high fixed costs (pains) and low use rates (pains).

Aggregated Value Proposition #11: *Shared mobility services firms* (products/services) *deliver higher levels of convenience value via the delivery of additional services* (gain creator) *within their PSS value propositions, which aim to minimize the complexities related to car ownership* (pains) *as well as rise trust and reduce uncertainty* (pain relievers) *towards these new ways of consuming mobility.*

4.3.2. Sharing, the sustainable choice for urban mobility

Shared mobility service firms often appeal to sustainability-related terminology in order to argue for the 'unsustainability' of car ownership. The arguments and terminology for proposing 'sustainable value' can vary, whether if the offered shared mobility service is actively more sustainable by design, in the case of electric mobility, opposite to fossil-fuelled car ownership:

> *"We believe we are doing a very important pedagogic labour by showing our users the advantages of utilizing an electric vehicle without the need of buying it: we are working for the greatest number of people gets to know that a custom, efficient and sustainable urban mobility is possible." – translated from Spanish. (Muving, F.4)*

As if what is proposed is a 'clean, green choice' that actually does not emit pollution and contributes to fight climate change by 'replacing' or 'keeping out' cars of the road:

> *"Mobikers are already making a green choice by keeping cars off the roads."* (Mobike, D.7)

> *"[…] and harmful CO2 emissions out of the air, making a tangible difference in the fight against climate change."* (Mobike, D.8)

> *"As a clean form of transportation, Mobike has also played a pivotal role in replacing car journeys and other polluting forms of transportation."* (Mobike, D.9)

So, what do shared mobility service firms propose for shifting from unsustainable mobility practices to sustainable practices of mobility consumption? The strategies proposed for

contributing to the environment and to sustainability in general are multiple. The following examples provide a perspective about how the studied shared mobility firms position towards this issue.

Some shared mobility service firms propose shifting from car ownership to the use of public transit systems and enhancing multimodality in combination with their offered shared mobility services:

> *"By shifting from cars to buses, CO2 emissions per person and kilometers in cities can be cut by 50%. Use public transport and take part in the #BreatheLife challenge this month to improve air quality. In the twit a picture reads: "Breath Life Challenge. This month I am taking public transport for clean air. Join me and take the #Breathelife Challenge"* (Mobike, D.10)

> *"Go beyond public transit. Zipcar is the perfect complement to the bus and train—whether it's local errands or weekend adventures."* (Zipcar, I.3)

The studied ridesourcing firms, Lyft and Uber go one step further by communicating their strategical acquisitions and alliances with third shared mobility services firms, both enhancing and enabling further multimodal transport and providing alternatives to car ownership in cities:

> *"We are excited to announce that Lyft has reached a transformative agreement to acquire Motivate, the largest bikeshare operator in North America." "Lyft and Motivate have both been committed for years to the same goal of reducing the need for personal car ownership by providing reliable and affordable ways to move around our cities […]"* (Lyft, C.8)

> *"Having a greater variety of transportation modes at your fingertips helps make it increasingly easy to live without a car. That's why we want to provide alternatives to personal car ownership by bringing together multiple modes of transportation right in our app."* (Uber, H.12)

The vision of some of these firms transcend their direct business action and aim to be transformative actors for redesigning how cities are conceived in terms of urban mobility. Their vision, they say, is to shift from car-focused urban mobility to contributing to create cities focused on people-focused, cars-less cities and with greater priority to people and the environment, together in cooperation with public institutions.

> *"At Lyft, our mission is to improve people's lives with the world's best transportation. We see the future as one where car ownership is optional, cities are designed for people instead of cars, traffic disappears, and every seat in every car is filled."* (Lyft, C.9)

> *"Through our technology and innovation, Uber has begun to change the way cities move. We share many of the same goals as the 600 cities we serve, and are committed to addressing the same challenges: reducing individual car ownership, expanding transportation access and helping governments plan future transportation investments."* (Uber, H.12)

Based on the previous analysis I configure the following aggregated value propositions:

Aggregate Value Proposition #12: *Shared mobility services firms* (products/services) *deliver more sustainable, greener and less polluting forms of personal transportation* (pain relivers) *than privately owned car transportation* (pains) *by enabling the shared use and shared performance of mobility among users* (gain creators).

Aggregate Value Proposition #13: *Shared mobility service business models* (products/services) *in combination and cooperation with other forms of shared and public transit systems* (products/services) *create and deliver environmentally sustainable forms of value* (pain relivers)*, as well as enabling more reliable and accessible forms of personal mobility* (gain creators)*, which aggregately offer a plausible alternative to car ownership*

4.3.3. Sharing enables improving efficient use of resources while reducing their environmental impacts

The idea of "inefficiency" is commonly used in order to talk about "unsustainability" and the effects that car ownership has on the use of resources. Some firms such as Uber are the ones that more often highlight the 'pains' that local environments suffer a results of car ownership inefficiencies of car ownership:

> *Our current mobility system is centred around throngs of individuals in their own personal cars. It's not only incredibly inefficient, it's simply unsustainable for our future cities."* (Uber, H.13)

As result, these inefficiencies which have a detrimental impact on public resources and public budget, public space and carbon footprint impact, among others.

> *"All this private ownership of course has a public cost. In the US we spend 7 billion hours a year wasted, sitting in traffic. 160 billion dollars in lost productivity […] and one fifth of all of our carbon footprint is spewed out in the air by those cars that we're sitting in. […] [I]f you have to own a car that means 96% of the time your car is sitting idle. And so up to 30% of our land and our space is used storing these hunks of steel. We even have skyscrapers built for cars." – Transcribed extract from audio-visual document.* (Uber, H.14)

In this way, the main value propositions that are made from a resource efficiency perspective refer to facing or counteracting the actual effects that car ownership is making in the present, due to its inefficiencies. In this section I show how shared mobility service firms counter act some of the resource inefficiencies that car ownership inherits and its related negative environmental and social impacts in local ecosystems. Given the many different approaches about how shared mobility service firms propose and operationalize their resource efficient potential, this section is divided into three smaller subsections. The first one (4.3.3.1) shows how firms propose value through optimising resources and maximizing service performance. The second (4.3.3.2) highlights how firms propose and qualify value related to reducing polluting emissions. The third (4.3.3.3), and in relationship with the previous two, shows how firms propose, from a local perspective, the positive actual and potential effects of reducing the number of private vehicles from cities and roads by substituting them for optimized fleets of shared vehicles.

4.3.3.1 Optimization: Minimizing resources while maximizing their productivity

One of the principal value proposals that shared mobility service firms often emphasise is their business models' capability to deliver, not only higher value than traditional mobility services or privately-owned vehicles, but also doing it by utilizing less resources and assets than those mobility business models. The retained vehicle ownership that whether firms themselves or their fellow partners (usually called 'riders') keep is translated into the

delivery of value propositions that communicate these business models' ability to managing resources more efficiently and environmentally responsibly.

Most of the studied shared mobility service firms base their resource-efficient value propositions on one of their principal business models' core competitive advantages: shared mobility service firms are capable of optimising the use of resources more efficiently, and furthermore, the are able to deliver high rates of mobility service value through less amount of vehicles and energy, making them a more sustainable alternative to car ownership. In this section I am going to gather those value propositions delivered by shared mobility service firms that contain the potential of reducing and optimizing resources, both vehicles (assets) as well as those material and energy resources needed for producing a shared mobility service.

Shared mobility service organizations propose an efficient use of resources given that one of their business models' competitive advantages is sustained by keeping their vehicles fleets as productive as possible during the longest period of time within the product's use phase. Therefore, shared mobility service firms propose resource-efficient value to their customers by keeping a relatively 'small' number of vehicles which, at the same time, can deliver a high volume of service for a large number of users. This way of managing assets and resources is also referred as optimization by some of the studied business models:

> *"Together, we're optimising one of the largest wasted resources worldwide — idle car seats — unlocking new capacity to meet growing aspirations for affordable and friendly mobility, whilst reducing our environmental impact along the way."* (BlaBlaCar, B.8)

> *"This year's gift is a promise: to promote the sustainable development of the entire industry, we will not add more bikes to any city with any city that has enough bikes already. No new Mobike will go out in those markets unless it replaces an older one."* (Mobike, D.7)

> *"An electric car spool is by far the most environmentally friendly transport solution, with few cars being used efficiently and running on renewable energy."* (Move About, E.3)

Service optimization is also what enables high levels of service with a lower amount of resources:

> *"3 million drivers providing mobility for 25 million riders."* (Uber, H.13)

But optimization is not only achieved by maximizing the use of vehicles, but also by employing resource-efficient technology for the delivery of mobility. This capability is more referred from schemes which use electric vehicles:

> *"Move About is a leader in electric car pools and optimization of vehicle fleets. […] with the least possible use of energy, production resources and public space." – translated from Swedish* (Move About, E.1)

> *"The energy efficiency of the car is three times higher than a car with a traditional combustion engine and, as a pool car, resource utilization is also significantly higher than in a privately-owned car which, on average, stands still for most of the day." – translated from Swedish."* (Move About, E.4)

With all, the optimization of resources enables shared mobility firms to propose a more environmentally sustainable consumption of mobility, given its related positive outcomes translated into 'less environmental impact per person':

> *"uberPOOL makes a difference. More people in fewer, fuller, more efficient cars can mean less environmental impact per person."* (Uber, H.13)

> *By optimising car usage, BlaBlaCar members are reducing carbon dioxide emission every day. In fact, together we have reduced roughly 1 million ton of carbon dioxide in the past year!* (BlaBlaCar, B.9)

Exceptionally, some shared mobility service firms have taken a step further in order to extend the productivity of their vehicles during their lifetime. For instance, Mobike developed a 'score system' as a strategy that 'encourage a responsible' use of their e-scooters among users, making them participants of controlling and reporting incorrect uses and behaviours identified in other users. Mobike itself explains it in the following sentences:

> *"To encourage proper and responsible use of the bikes and a healthier bikeshare community, Mobike has implemented a "Mobike Score" system. Each user will start with a Mobike Score of 550 by default. The Mobike Score will change based on user behaviour. In the future, a user's Mobike Score will affect their fares and use of the system. If a user's Mobike Score drops to below 100, their Mobike account will be suspended and they will not be able to access any Mobike services."* (Mobike, D.1)

The role that the user plays in order to find out irresponsible or illegal uses of Mobikes is the key for the proper development of the system. Thus, Mobike users are encouraged to identify and denounce incorrect behaviours for the shake of the proper run of the sharing system, while providing incentives and penalties to keep responsible users and ward off irresponsible ones.

Further optimizing strategies are also found by influencing customer use of vehicles by implementing variable price ranges that both encourage their use for a short time and penalizes long-time uses. For instance, public bikesharing schemes such as Santander Cycles and BiciMAD develop an exponentially growing price system based on hours per service use. For daily (or eventual) usage Santander Cycles set a 2£ price for a 24 hour access, as long as the bike is returned to any dock within a 30 minute lapse. Journeys longer than 30 minutes are charged with 2£ for every minutes (Santander Cycles, G.6). In the case of BiciMAD, its price policy for occasional bike use determines a 2€ rate for the first hour, which will increase to 4€ for each additional hour that the electric bike is. (BiciMAD, A.6). Indeed, this price and commercial strategy promotes customers to maximize the service use while keeping the maximum number of idle bikes available for potential users.

Based on the previous analysis I configure the following aggregated value propositions:

Value Proposition #14: *Shared mobility services firms* (products/services) *are able to optimize the use of their vehicles (gain creators) which enables them to deliver resource efficient value* (gain creator) *to customers with a lesser number of vehicles* (pain relievers) *and a lower consumption of resources and energy* (pain relievers) *in comparison with the actual inefficient use* (pains) *of privately owned cars.*

Aggregate Value Proposition #15: Bikesharing schemes (products/services) encourage users to perform more responsible use *(customer jobs)* of their shared bicycles as well as to make shorter trips *(customer jobs)* in order to co-create and deliver higher utility value to them in forms of better product performance *(gain creator)* and higher service availability *(gain creator).*

4.3.3.2 Reducing polluting emissions

When it comes to resource efficiency, environmental outputs are of high relevance for shared mobility service firms, and thus their business models' capabilities of reducing emissions are often highlighted in their delivered value propositions. Indeed, an

environmentally sustainable shared mobility is often highlighted by these firms in their value propositions given the impact that the reduction of assets and energy resources has in terms of polluting emissions. Therefore, it is often observed how these firms combine the identified vehicles and energy reduction efficient value together with the measured impact of these reduction in terms of i.e. reduced driven miles, saved CO2 tones emissions, or number of cars 'taken away' from the roads. Thereby, these environmental positive impacts are addressed to the user (or potential user) as active contributions that shared mobility service users do in order to consciously lower their own mobility-related carbon footprint thanks to their active use of shared mobility services. In order to 'translate' the environmental value of reducing greenhouse effect emissions to the atmosphere, shared mobility service firms tend to establish connections between the customer's use of the shared scheme and the related 'saved' emissions (usually referred as CO2 emissions) *in comparison with* the emissions that privately-owned vehicles would have produced instead. The use of numbers and figures are usually used to represent this kind of resource-efficient value:

> *"To date, Mobike users have collectively cycled over 18.2 billion kilometres, equivalent to reducing CO2 emissions by more than 4.4 million tons, or taking 1.24 million cars off the road for a year. In recognition of its transformative contribution to the advancement of low carbon public transport, Mobike was named among the 2017 Champions of the Earth by the United Nations Environment Programme (UNEP)."* (Mobike, D.11)

> *"With every ridden kilometer 140 grams of carbon dioxide are saved […] in comparison to driving scooters powered by internal combustion engines"* - translated from Spanish. (Muving, F.5)

If emissions are one of the most used resources for measuring the impact of shared mobility in comparison to car ownership, the source of those emissions, this is, the consumption of fossil fuels are, thus, also utilized in order to exemplify the pollution saving potential of shared mobility services. Interestingly, those sharing systems that utilize fossil fuelled cars in their carpooling and carsharing schemes are the ones that mostly highlight this environmental competitive advantage.

> Regarding uberPOOL - *"Shared rides can lead to a world of good, from reducing fuel and carbon emissions to minimizing traffic and congestion."*
> *"In 2017, drivers served 35 million riders in POOL trips. If these riders had instead driven by themselves, cities might have seen an additional 314 million vehicle miles and 82,000 metric tons of carbon dioxide emissions."* (Uber, H.9)

> *"Driving smarter. After joining Zipcar, 90% of our members drove 5,500 miles or less per year. That adds up to more than 32 million gallons of crude oil left in the ground—or 219 gallons saved per Zipster."* (Zipcar, I.4)

Ultimately, I would like to highlight the 'shy attempts' of some of the studied shared mobility firms in order to close the resource loop by recovering their owned vehicles at the end of their life cycle. These firms employ light vehicles, in their case bicycles, which perhaps enable them to develop control and recovery activities to put their vehicles back into the sharing system, and so reducing the amount of resources necessary.

The "fleet control and recovery protocol" that BiciMAD deveops shows the existence of a resource efficient strategy that aims to return functional bicycles into the system in order to minimize the use of resources and so, keeping and recapturing value within the system.

> *"The new bicycle fleet control and recovery protocol developed by @EMTmadrid is providing results: BiciMAD reduces the number of disappeared bikes in a 58%."*- translated from Spanish. (BiciMAD, A.7)

Mobike, on the other hand, proposes to contribute with all the sharing platforms in Dallas by recovering their shared bikes, regardless which company's. This example is, perhaps, rather a green-washing marketing strategy than an actual ongoing resource recovery strategy, given the existing lack of information about it and the local implementation of the proposed value recovering activity:

> *"Yes, Mobike will pick up knocked over bikes when we see them, no matter which company they're from. [...] #bikeshare #biking #cycling #docklessbikeshare #MobikeUSA #tech #startup #technology #community. Dallas bike share company will pick up knocked over bikes. Bike share battle: with clean-up deadline looming one bike company offers to help rivals".* (Mobike, D.12)

Therefore, although there exist certain actions and intentions to propose resource efficient value by recovering resources, and thus maintaining and recapturing value within the system, it is not a major activity highlighted in their value propositions.

Based on the previous analysis I configure the following aggregated value propositions:

> ***Value Proposition #16:*** *Shared mobility services firms* (products/services) *create and deliver utility for the customers while quantitatively delivering less (or saving) CO2 emissions* to the atmosphere (pain relievers) *due to the optimized and reduced use of vehicles and energy* (gain creators), in comparison to the emissions that privately owned cars deliver (pains).

4.3.3.3 Local impacts: transforming public space and reducing traffic congestion

This second part of the section shows the proposed capabilities of shared mobility services to further reduce negative social and environmental outputs that cities suffer due to the major use of private car. Thus, what shared mobility service firms mainly propose is to both reduce traffic congestion in cities (and it's the related negative effects in terms of health, pollution and life quality) as well as to empty and potentially give back all those spaces now dedicated to parking private cars, which they aim contribute to transform into valuable spaces with a higher socio-economical value.

Traffic congestion is one of the main value gainers that shared mobility firms deliver for the benefit of the society itself. Their business models' potential to reduce the number of cars from road and cities is their primary argument for proposing such value:

> *"Fewer cars. Way Fewer. Each and every Zipcar takes 13 personally-owned vehicles off the road. Multiply that by the thousands of cars in our fleet and you've got a really big number."* (Zipcar, I.4)

Additionally, shared mobility service firms propose that sharing vehicles has the potential to 'free' public space by reducing the need for individuals to park their private cars. The logic, indeed is both simple and effective: less cars means less need for parking spaces.

> *"Save space - Encouraging cycle hire usage can reduce the requirement for car and private cycle parking spaces"* (Santander Cycles, G.7)

Thereby, shared mobility service firms offer an inherent potential to transform public space occupied by parking lots into socially focused spaces with people and nature as major priorities:

> *"More green space. What would the world look like if everybody shared cars instead of owned them? Save paradise and tear down that parking lot."* (Zipcar, I.4)

> *"Positive outputs from biking to work: […] It leaves more public space for people."* – Translated from Spanish. (BiciMAD/City Council of Madrid, A.8)

Furthermore, those shared mobility service firms which offer customized services to organisations such as private companies or universities highlight their ability to ease these organisation's needs for managing their parking spaces, reducing space and traffic congestions and even meeting these organisations' own sustainability goals.

Some of these firms are already highlighting how there are contributing to create value for their corporative customers by helping them to efficiently manage reducing parking and traffic congestions around their organizations. Zipcar uses its customers impact in order to make more tangible their proposed value:

> *"For the university what we find particularly beneficial is that we were able to reduce the demand for parking here at our campus and we were also been able to meet some of these sustainability goals that we have"* – Video clip extract: Blanca Gamez, University of Texas at Austin (U.S.). (Zipcar, I.6)

> *"ZipCar really filled the niche. The biggest benefit is if I got 30 ZipCars on campus that's probably something between 400-500 cars that I don't have to park. […] That 400-500 is what makes our entire system work"* – Video clip extract: Greg Smith, John Hopkins University (U.S.). (Zipcar, I.6)

Based on the previous analysis I configure the following aggregated value propositions:

Aggregated Value Proposition #17: *Shared mobility services firms* (products/services) *have the potential to create and deliver resource efficient and sustainable value by mainly reducing the number of cars ridden* (gain creator), *which has a reduction impact on traffic congestion* (gains) *and public space* (gains) *if customers shift private car mobility for that of shared mobility* (customer job).

4.4. Summary of the resulting aggregated value propositions

The following table summarises the resulting analysis of the previous three sections (4.1, 4.2 & 4.3):

Number	Aggregate Value Proposition
#1	Shared mobility service (SMS) firms deliver an easy and convenient (gains) shared mobility service systems (from booking, through vehicle/mobility access until use/mobility performance) (products/services) enabled by ICTs (gain creators), which play a fundamental role in creating and delivering value for and by users.
#2	SMS firms facilitate an easy and convenient payment process (gains) enabled by ICTs (gain creators), which play, once more, a fundamental role in capturing value from users.
#3	SMS firms deliver reliable, safe and trustworthy (pain relivers) mobility services (products/services) enabled by the integration of ICTs in business models (gain creators). In the case of P2B2P shared mobility platforms, members' role (drivers and rides alike) is essential for co-creating, maintaining and controlling a safe and trustworthy shared mobility network/system (pain relivers), which gains such values based on their shared experience, ratings and feedback (customer jobs).

#4	SMS firms deliver easily accessible (gains) shared mobility services (products/services) by strategically distributing their vehicle fleets throughout cities and nearby public transport stations (gain creators), by enabling shared mobility platforms of millions of members (ridesharers and drivers) who ultimately grant delivering ubiquitous shared trips (gain creators), and by enabling the access and use of their services in a 24/7 time frame (gain creators).
#5	P2B2P Shared mobility platforms such as ridesharing and ridesourcing schemes (product/services) offer a convenient, simple and self-manageable 'job' (gain creator) to individuals who need (pains) an easy and reliable source of income which may enable both fulfilling driver's goals and simultaneously provide a sense of empowerment to the driver (gains). In exchange, drivers must deliver shared mobility services to users via the use of ICTs and by means of their own private vehicle (driver's jobs).
#6	SMS (products/services) complement mass transit systems by delivering shared mobility solutions (gain creators) for the so called 'first-mile, last mile' problem (pains) in convenient and reliable ways (pain relivers).
#7	The combined use (gain creators) of shared mobility and public transit systems (products/services) are a sustainable way of fulfilling personal mobility needs (gains), with the potential to decrease environmental depletion and foster local economic growth (superior gains).
#8	SMS (products/services) provide more convenient and less problematic (gains) mobility solutions than short-distance mass transit systems (pains) thanks to more customer-focused shared mobility offerings (gain creators).
#9	P2B2P sharing mobility platforms (products/services) offers a decentralised mobility platform (gain creators) which delivers a more convenient, accessible and interconnected 'door-to-door' mobility solutions (gains), enabled by ITC and a world-wide community (gain creators), which provide superior utility to users than the centralized long-distance mass transit systems (pains).
#10	SMS firms (products/services) enables more convenient, cost-saving offerings (pain reliver) thanks to optimised on-demand services (gain creators) in comparison with car ownership's high fixed costs (pains) and low use rates (pains).
#11	SMS firms (products/services) deliver higher levels of convenience value via the delivery of additional services (gain creator) within their PSS value propositions, which aim to minimize the complexities related to car ownership (pains) as well as rise trust and reduce uncertainty (pain relievers) towards these new ways of consuming mobility.
#12	SMS firms (products/services) deliver more sustainable, greener and less polluting forms of personal transportation (pain relivers) than privately owned car transportation (pains) by enabling the shared use and shared performance of mobility among users (gain creators).
#13	SMS business models (products/services) in combination and cooperation with other forms of shared and public transit systems (products/services) create and deliver environmentally sustainable forms of value (pain relivers), as well as enabling more reliable and accessible forms of personal mobility (gain creators), which aggregately offer a plausible alternative to car ownership.
#14	SMS firms (products/services) are able to optimize the use of their vehicles (gain creators) which enables them to deliver resource efficient value (gain creator) to customers with a lesser number of vehicles (pain relievers) and a lower consumption of resources and energy (pain relievers) in comparison with the actual inefficient use (pains) of privately owned cars.

#15	Bikesharing schemes (products/services) encourage users to perform more responsible use (customer jobs) of their shared bicycles as well as make shorter trips (customer jobs) in order to co-create and deliver higher utility value to them in forms of better product performance (gain creator) and higher service availability (gain creator).
#16	SMS firms (products/services) create and deliver utility for the customers while quantitatively delivering less (or saving more) CO2 emissions to the atmosphere (pain relievers) due to the optimized and reduced use of vehicles and energy (gain creators), in comparison to the emissions that privately owned cars deliver (pains).
#17	SMS firms (products/services) have the potential to create and deliver resource efficient and sustainable value by mainly reducing the number of cars ridden (gain creator), which has a reduction impact on traffic congestion (gains) and public space (gains) if customers shift private car mobility for that of shared mobility (customer job).

Table 1: Resulting 18 aggregate value propositions of the analysed shared mobility service business models.

5. CONCLUSION AND DISCUSSION

In this last section, the results and conclusions (5.1.) obtained from the developed empirical research study are first presented. One by one and in the initially established order, detailed answers to the research questions are provided in this section. Then, a theoretical discussion (5.2) takes place regarding the obtained results that give answer to the research questions. The results are critically discussed regarding the proposed research aim and contextualized within relevant literature in CE business models and shared mobility. Finally, a discussion around the theoretical and practical relevance of this thesis is presented regarding its contributions to both the service management fields and to the society. Also, recommendations for future research are ultimately provided.

5.1. Results and Conclusions

The aim of this master's thesis is to empirically study how service firms manage and qualify their value propositions in order to shape shared mobility consumption in practice. For achieving such aim, an online ethnographic research has been carried out in order to study and analyse the value qualities of the value propositions delivered by shared mobility service firms.

In this study the service offerings of shared mobility business models both are empirical and practical examples of what the circular economy (Ellen MacArthur Foundation 2012; 2013) defines as new business models that propose alternative 'servitizing' and 'dematerializing' forms of mobility consumption which propose shifting the traditional vehicle ownership-based consumption for shared vehicle access and shared mobility performance. The studied ten shared mobility service business models have shown the exitance of heterogeneous approaches by which firms propose alternative forms of ownership-less mobility. Some of the studied firms propose value through B2C product-service systems (Tukker, 2004), more particularly carsharing (Move About and Zipcar), bikesharing (Santander Cycles and Mobike), and e-bike (BiciMAD) and e-schooter sharing (Muving) (SUMC, 2016). The rest of the studied shared mobility service business models embody P2P sharing platforms (Lacy et al., 2014), both P2P ridesharing (Uber, Lyft) and carpooling (UberPOOL, Blablacar) (SUMC, 2016).

Taking into account the heterogeneity of these shared mobility business models' value creation logics, I have configured a series of aggregated value propositions (AVPs) which, with the use of the Value proposition Canvas (Osterwalder et al., 2015) as a theoretical tool allows me to synthesize the different arguments by which shared mobility service firms propose different forms of value via the value proposition (a set of products and services, gain creators and pain relievers) according to the determined customer segment (and its own gains, pains and customer jobs).

The analysis and categorization of value propositions performed in *section 4* enables me to answer this thesis' first research question: *How do shared mobility business models as an example of circular economy business models qualify their value propositions?*

These are main identified value qualities of the studied shared mobility service value propositions:

1. *Convenience*

'Convenience' is probably the most used value quality by which shared mobility service firms frame their value propositions. Multiple aspects of the offering are qualified as convenient, being 'convenience' a type of value that qualifies all the stages in which firms

and cooperate for creating, delivering and capture value. Here I refer to 'convenience' as the value quality that "embraces" other identified value qualities such as 'simplicity', 'instantaneity' or 'costs saving', as I understand that the later qualities converge into a same overall 'convenience' value.

The implementation of ICTs is one of the main enablers of convenience, which enables firms to propose higher convenience gains for users during the booking, access, use (AVP #1) and payment processes (AVP #2). Additionally, P2P shared mobility platforms particularly propose an overall convenient source of income for drivers (specific stakeholders for the P2P mobility sharing platforms) which is commonly qualified as a simple, flexible and self-manageable 'job' or activity. Their strategic positioning towards public transit systems enable these firms to propose 'first mile, last mile' solutions which aim to complement public transportation, and overall contributing to making commuting experience more convenient for the user (AVP #6).

On the other hand, the B2C use-oriented shared mobility schemes qualify their service as being more convenient as these allow users to avoid consumption complexities that short-distance public transit systems inherit themselves (AVP #8), while P2P sharing mobility platforms qualify their service as being more convenient than long distance public transit systems as their services are 'decentralized' from urban cores and are linked to a wither network of routes worldwide (AVP #9).

Ultimately, 'convenience' is one of the main value qualities according to how these firms frame their competitive advantages' value potential in comparison with car ownership-based mobility. Shared mobility is qualified as being qualitatively and quantitatively more convenient than car ownership. Replacing car ownership for sharing the use and the rides with a network of users or members enables major cost savings (AVP #10) and a diminution of ownership-related consumption complexities by delivering an optimized on-demand personal mobility needs which are fulfilled by implementing a set of included services that seek to minimize users' 'jobs' and 'pains' (AVP #11) as these are taken over by the service provider.

2. Accessibility

Enabling and improving accessibility to their shared mobility schemes is another of the main focuses of the studied firms. In this case, accessibility is related with the studied firms' proposed capabilities to make shared mobility more physically accessible and with providing mobility solutions (such as door-to-door and first-/last-mile) that overall are economically more accessible for the general population than the car ownership. Service accessibility is strictly related with the capability of shared mobility business models to deliver value to consumer. These firms assert that accessibility is enabled and eased by strategically setting an easily accessible network of shared vehicle fleets distributed across cities and which are made available 24 hours, 7 days a week (AVP #4). These firms assert to ensure a high accessibility thanks to their network of millions of ridesharers (in P2P markets) and drivers (in both B2C and P2P markets) who grant a wide service availability (AVP #4).

Additionally, shared mobility service firms position their offerings as more accessible than their public transit system competitors. In this extent, P2P sharing mobility platforms are the business models who particularly highlight their competitive advantage having a decentralized, virtual mobility sharing platform networks as the enabler for getting access

to seamless 'door-to-door' (Cohen & Kietzman), in comparison with centralized and inflexible long-distance public transit systems (AVP #9).

Ultimately, the strategical combination of shared mobility services with mass transit systems is proposed to deliver greater accessibility to more individualized 'fist-, last-mile' mobility solutions, while being economically more accessible than car ownership (AVP #13).

3. Reliability

'Reliability' is presented by firms as another main embedded value quality in the offered services, embracing other related qualities such as 'safety', 'trust' and 'availability'. Fundamentally, shared mobility services are framed as 'reliable' supported by seamless presence and strong integration of ICTs in their business models, which enable delivering additional safety tools and services than aim to lower uncertainty and rise trust (AVP #3 & #11). In the particular case of P2P shared mobility platforms, firms enable and encourage a trustworthy and save environment throughout their sharing network which is strongly supported by users' feedback, rating systems and transparent information (AVP #3).

As a particular example of promoting reliability among users is the one proposed by two of the studied bikesharing schemes, which by controlling and promoting a more responsible shared use of their vehicles seek to maximize the optimal state of their bike thus, proposing a more reliable product performance to users a greater service availability driven by a conscious community (AVP #15).

4. Sustainability and Resource Efficiency

Sustainability and resource efficiency terminology are closely related to each other in sustainable business models literature (Wells, 2013). However, the first one can be used vaguely by companies who may refer to one or more of the economic, environmental or social aspects sustainability (Washington, 2015), while the second is referred to the strategical approaches to slow, close and narrow resources resource loops via the development of circular strategies implemented in a business model (Bocken, N. M. P. et al., 2016; Nußholz, 2017). Therefore, I separate the value propositions qualified as 'sustainable' from those qualified as (or making reference to) 'resource efficient'.

Shared mobility services on their own (AVP # 12) and multimodal transport (combined use of shared mobility and other mass transit systems) (AVPs 7# & #13) are both framed by these firms as 'sustainable' ways of consuming mobility, proposing overall lower negative environmental impacts compared to the actual impact of privet car use (AVPs #12 & #13). Additionally, multimodal transport is proposed as a socio-economic driver providing greater positive impacts in local societies (e.g. the creation of local jobs) (AVP #7) in comparison to the socio-economic impacts produced by car ownership-based mobility.

'Efficiency' is probably the more detailed and commonly referred value quality of shared mobility service business models. The main enabler and argument for the proposal of efficient value is the capacity of these business models to "optimize" the use of their vehicles among multiple users, which is enabled by these business models' competitive advantage to deliver utility to customers utilizing a lesser number of vehicles. 'Resource efficiency', thus, is that which shared mobility service firms achieve by substituting the use of inefficient and polluting private vehicles for that of optimized shared use of fossil fuelled, electric and non-fuelled vehicles. Such optimization in the shared-use of vehicles leads firms to propose services a quantitative reduction of resources and energy consumption through the use of

shared mobility services (AVP #14) and the consequent reduction of CO2 emissions derived from the reduced amount of products, resources and energy consumption (commonly referring to fossil fuels) (AVP #15). Additionally, the overall reduction of private vehicles is qualified as contributing to reduce their negative environmental and social impacts in a local level through mainly reducing traffic congestion (related to the polluting emissions and the space that they occupy while circulating through cities and roads) and 'saving' or emptying public spaces which are actually dedicated to parkin cars. The value proposal, thus, is a positive transformative potential for cities in benefit of society and the environment (AVP #17).

Having identified the main value qualities that are found embedded in shared mobility service firms' value propositions, I continue providing answer to the second research question: ***How do shared mobility service firms attempt to shape the consumption of mobility in practice?***

1. *Offering seamless and customer-focused shared mobility services enabled by ICTs*

The studied shared mobility service firms are strongly supported by ICTs which are, without a doubt, one of the main gain creators for the delivery of convenience and accessibility value throughout the whole consumption process. ICTs are presented as the enablers that make possible a seamless consumption of shared mobility, embracing almost all the processes: from the initial communication between consumer and firm in which the service is customized, booked and finally paid – usually enabled by an app or online platform –, to the physical access to the vehicle – which is made effective e.g. through the same app or via a smart card (AVP #1 & 2). Additionally, the proposed combination of ICTs and a wide geographical presence, as a main accessibility creator (AVP #4), enable these firms to propose high levels of availability value, potentially able to fulfil the eventual and difficult-to-predict customer mobility needs in the city environment.

2. *Generating value creation from the cooperation of both service users and drivers*

The necessary active participation and cooperation from the consumer side is a necessary requirement of all shared mobility business models in general, weather if they propose value through use-oriented PSS (Tukker, 2004) or through a shared platforms business model (Lacy et al., 2014). It has been identified that in P2P shared mobility business models in particular(AVP #3), such is the case of Blablacar in this study, the co-creation of value in post-consumption processes is particularly important or those business models which importantly rely on the behaviour and willingness to cooperate of both riders and drivers. Blablacar, thus, make an important call for both drivers and riders to engage in the sharing of personal experiences with other consumers either via ratings, comments or direct feedback to the company. This meta- or post-consumption activities are key to P2P shared mobility business models as they enable the co-creation of a trustworthy and safe network or shared mobility system in which strangers are willing to cooperate in search of the fulfilment of their own necessities.

3. *Translating the responsibility for the proper use of shared vehicles to consumers*

While cooperation from consumers is at some extent a prerequisite for the proper functioning of any shared mobility business model, only one of the ten studied firms actually take over the proposal of the establishment of a shared responsibility for the shared vehicles in between the delivering and the using consumers. This is the case of the Chinese free-floating bikesharing scheme, Mobike, which via the proposal of an effective sharing scheme the firm establishes a penalty and reward system among its users that aims to ensure the

availability and reliability of its services. By doing so, users are called to take further responsibility of the bikes, not only by making a proposer use of a bike during its use but also participating in making sure that other users also do so, being asked to detect and denounce inappropriate uses and behaviours (AVP #15).

4. Converting car owners into key 'drivers' of value creation

P2P shared mobility platforms such as ridesharing and ridesourcing schemes require of the participation and involvement of the 'driver' as an essential figure for the value creation and delivery processes of these business models. The analysed driver-focused value proposition from ridesourcing firms Uber and Lyft indicate a similar strategy for attracting new drivers to their schemes: enhancing the position of the driver as a convenient, simple and self-manageable 'freelance job'. In this way, further than just proposing an eventual source of income to drivers, what ridesourcing firms aim to propose to drivers is an 'empowering' position which may enable individuals to make more of their resources (e.g. car, time), being able to become their own bosses and ultimately obtaining a 'meaningful' job or activity that provides what the driver is looking for to achieve in the short and long-run.

Attracting and converting individual car owners, and giving them a meaningful mean through which achieve their life-goals can be seen as a clever value proposition that seek obtaining medium- and long-term cooperation in between the firm and the 'freelance driver', enhancing the solidity of the business model and its capability to grow.

5. Filling the gaps of mass and public transit systems

The studied shared mobility value propositions show two different strategies towards filling the actual gaps of mass transit services:

By combining and complementing each other, some shared mobility schemes and mass transit systems are proposed to provide solutions to first-mile, last-mile gaps in convenient and reliable ways (AVP #6); being a combined sustainable mobility solution that both is able to ultimately fulfil customer needs (AVP #6 & #13) with the potential to decrease environmental depletion (whose responsibility is largely pointed at the inefficient use of private car in cities) and foster local economic growth (AVP #7 &#13).

By competing with mass (e.g. local bus network) and public (e.g. taxi services) transit systems, and ultimately substituting these, some shared mobility schemes are proposed to deliver higher convenience value gains as well as a reduction of the complexities related with the use of public transportation thanks to the implementation of ICTs in shared mobility schemes, enabling higher levels of customer-focused mobility services (AVP #8). Additionally, the particular case of Blablacar highlights the willingness to propose P2P ridesharing as the technological solution for long-distance mass transit service gaps, related to its capacity to fulfil door-to-door mobility needs (AVP #9).

6. Reducing the private use of cars

Reducing the use of private car ownership is one of the main goals through which shared mobility service firms can shape mobility in cities. The multiple arguments around gain creators of shared mobility services compared to the use of private cars are multiple and quite varied, therefore these can be analysed from two different perspectives:

On the one hand, by proposing gain creators – such as PSP which provide higher levels of convenience thank to customer-focused services – and reducing the traditional pains and customer jobs related to car ownership – such as e.g. the fixed costs and maintenance duties – (AVP #10 & #11) share mobility service firms provide customers with a new consumption

logic of convenience and cost-savings. These proposed logic aims ultimately to substitute the private use of cars in cities for that of shared mobility including high levels of service that fit the mobility needs of the consumer to its major extent.

On the other hand, shared mobility firms qualify their services as creators for sustainable gains following different lines of action, but which however, all follow the same logic, that mobility sharing as at any extent more environmentally sustainable than car ownership. One of the main arguments is centred on that shared mobility is more sustainable (also qualified as 'greener') because it is argued to deliver less polluting emissions than private car mobility (AVP #12), as well as employing less energy and vehicles needed to fulfil customer's mobility needs (AVP #14 & 16#). The resource efficiency potential that shared mobility business models employ to propose sustainable value gains to customers its mainly supported by these business models' competitive advantage to optimize the use of resources and maximize the productive capacity that shared vehicles provide, compared to the 'inefficient' use of underutilized privately owned vehicles. Thus, shared mobility business models are not only able to deliver high levels of mobility service to customers that proposes to create new gains and resolve the traditional pains of car ownership, but additionally by substituting the latter the benefits for the environmental and the society are proposed as less congested and polluted cities as well as fryer of cars in its public areas (AVP #17).

- DISCUSSION: The second condition need to be fulfilled in order for the first to 'happen'

5.2. Discussion

In a traditionally stable and relatively unchanging market environment, urban mobility systems have kept inert and mobility options siloed into a few schemes (Santi & Ratti, 2017). Short- and long-distance public transit systems, on the one hand, have kept carrying a great number of passengers within fixed routes and schedules, while the taxi and the private vehicle, on the other hand, have been criticised for their underutilized, inefficient use, transporting a small, limited number of passengers with greater flexibility though (Santi & Ratti, 2017). During the XX century, the cities of the majority of developed countries experience an exponential growth of private car, being the main mobility mode through which one could obtain flexible and on-demand transportation. Traditional public mobility systems have neither experienced major innovative changes in their business models, maintaining their traditional structures and, therefore, unsuccessful in proposing an attractive alternative to private car mobility.

In the last decade the eruption of new shared mobility business models has been catapulted thanks to the development of disrupting ICTs (Lacy et al., 2014) which have driven the creation of new business models within the so called sharing economies of collaborative consumption, whose common main value proposition has been to capture the underutilized value from products through sharing them among consumers (Cohen & Kietzman, 2014).

New shared mobility business models are related to the potentially sustainability benefits of the sharing economies, embodying sustainability-oriented innovations to fulfil a contemporary demand for sustainable solutions from consumers, industries and governmental stakeholders (Cohen & Kietzman, 2014). 'Sharing' is proposed as an alternative logic for creating, delivering and capturing value, which is directly confronted with the traditional ownership-based mobility consumption (Santos, 2018). 'Sharing' is also presented as a circular strategy for business models to retain and recapture value embedded in their own assets and resources (EMAF, 2015a). Additionally, some authors are

already recognising the potential of some shared mobility services in reducing the use and ownership of private cars (Bondorová & Archer, 2017; Finger et al., 2017). Therefore, these new modes of urban shared mobility are proposing alternatives to all established traditional mobility modes, capable of questioning through new propositions of value the urban mobility status quo in which the private car has prevailed as the main transport mean for some people in most of the cities in developed countries.

Given this, this master's thesis aims to study the modern phenomenon of shared mobility business models by questioning how shared mobility firms can shape the consumption of urban mobility through their delivered value propositions. The combined analysis of the value propositions of ten technologically innovative shared mobility service firms has shown that these firms fundamentally rely on four main value qualities for proposing value through their mobility service schemes: convenience, accessibility, reliability, and sustainability & resource efficiency. These value qualities are operationalized as both superior gains and customer pains relievers, highlighting the competitive advantages of these shared mobility business models, which are recurrently compared to those established urban mobility modes weather if they are public transit systems or private owned cars. Additionally, the operationalization of these value qualities enable shared mobility schemes to propose a series of changes in the way urban mobility is to be consumed, providing a corporative vision in which disrupting shared mobility business models aim to shape behaviours and practices around urban mobility.

5.2.1. Car-less cities: the combination of gain creators and pain relievers towards more sustainable mobility consumption?

The study has identified the various value-creating strategies through which shared mobility systems aim to reduce and, in some cases, substitute the use of the private car, particularly in urban environments.

A majority of shared mobility service systems – among which carsharing schemes are particularly active – address the consumption pains that commonly afflict the privet car owner: high fixed costs related with insurances, vehicle maintenance and fuel, as well as the related customer jobs such as the bureaucracy involving contracting additional services and the parking duties, among others. Shared mobility schemes address these pains by proposing high levels of convenience value through the services that constitute their overall offering. In most of the cases, their offerings propose to deliver door-to-door 'seamless' mobility, strongly sustained by customer-focused value offerings enabled by ICTs. As result, shared mobility service operators fundamentally operationalize their business models' core advantage for optimizing the use of vehicles among users, and thus propose a more sustainable, less polluting, energy consuming urban mobility, with the potential of contributing to create less congested and car busy cities.

Some authors have already discussed shared mobility modes potential to reduce private car use and ownership from cities, and the literature is neither sufficient nor consistent towards the possible positive and negative effects that shared mobility can produce in this regard. Finger et al. (2017) argues that although all types of shared mobility services have the potential to substitute the private car in some extent, carsharing and ridesharing business models possess the greatest potential. Bondorová & Archer (2017, p. 1) estimates that "[c]arsharing schemes […] lead to reduced car ownership with studies indicating 5 - 15 cars are replaced for each shared car added to the fleet" while "ride-sharing apps do reduce the number of vehicles on the road and vehicle kilometres driven". However, Santos (2018) rises relevant criticism about the environmentally sustainable potential of shared mobility,

discussing that nor carsharing neither ridesourcing schemes (those similar to Uber and Lyft business models offering on-demand taxi-like services) do not seem to have the potential to reduce CO2 emissions substantially. Nevertheless, Santos (2018) argues that carpooling and ridesharing business models – shared mobility schemes which provide incentives to value creation among drivers and users sharing the same vehicle and a common route or destination do actually show promising congestion and CO2 emission reductions. Santos adds, however that carpooling schemes' mobility offerings (e.g. Blablacar, UberPool) inherit the greatest utility disbenefits in terms of waiting time, comfort and convenience.

In this regard, this thesis has shown through the analysis on Blablacar, UberPool & Lyft's value propositions how carsharing and carpooling firms make great efforts in counteracting these utility downturns by commonly addressing the greatest convenience, accessibility and reliability of shared mobility in comparison with traditional public and mass transit services, possibly uncapable to yet compete with privet car's convenience and accessibility utility values. Yet, as some studies already show that among consumer's reasons to use carpooling, lower prices and convenience are among the main drivers of these business models' growth (Finger et al., 2017; Shaheen et al., 2016). This study shows the important role of ICTs in enabling convenience-like value qualities such as on-demand mobility, flexibility in terms of time of departure and wide range of available trips. Therefore, ICTs are among the main gain creator enablers for shard mobility business models to substitute the use of the inefficient us of the private car, for that of a more efficient and optimized use of the car that is convenient and economically competitive with other transit system as well as private car mobility.

Some authors also observe the greater potential of combined offerings of shared mobility and mass transit services to substitute the private vehicle, and argue for the promotion of the complementarity of shared mobility services to fill up mass-transit first-/last-mile gaps (Finger et al., 2017) as well as encouraging behavioural changes towards multimodality, including sustainable public and active forms of transportations (e.g. walking and biking) (Bondorová & Archer, 2017). In this extent, it is particularly relevant the strategical and communicative efforts of a majority of the studied shared mobility schemes do in order to propomote the combined use of shared mobility and mass-transit systems. Particularly, Finger et al. (2017, p. 43) advocate "Mobility as a Service (the combined commercialisation of mass-transit and shared mobility solutions by a single entity, under a single price) might be the framework under which the substitution of the private vehicle becomes a reality". The ridesourcing firms Uber and Lyft develop partnership and collaboration projects in order to either develop multimodal app services or to integrate their services into transit apps (in the case of Lyft and Uber respectively), proposing "certainty and reliability" to multimodality by offering or developing MaaS systems and apps that help *"to bridge the gaps in transit systems"* (Uber, H.9). Additionally, the municipally managed mobility and transport company of Madrid (which BiciMad belongs to) highlights its work towards fostering multimodality, with reference to its own MaaS app, which gathers all the sustainable public and shared mobility services available in Madrid.

However, the expected environmental and social positive repercussions combining shared mobility and public transit systems for filling the first-last mile gap are still unknown, and make wonder why no government has provided incentives to increase shared mobility market penetration (Santos, 2018). It is possible that the recent and yet exponentially growing phenomenon of shared mobility needs time in terms of creating cooperative agreements in between local institutions and privet firms, being required the sharing of big data from shared mobility operators side with public transport companies– which at the

moment may be reluctant to share – as well as new shared mobility service are yet need to be integrated into the existing regulations, providing greater legal certainty and coherent regulatory policies across all new and traditional transport modes (Finger et al., 2017).

And yet, regardless shared mobility service firms' potential capabilities to maximize the utilization of their shared vehicles (EMAF, 2015b) with the potential to shift consumption behaviours and reduce private car ownership and invidual consumption (Kjaer et al., 2018), not the studied shared mobility services firms clearly address how they actually manage and operationalize these sustainable potentials. On the one hand, shared mobility business models operating PSS (Kjaer et al., 2018) embed the potential to displace other more resource intensive systems. However, the value offerings delivered from PSS are not sustainable per se, but they are only able to ensure net resource reduction as soon as the consumption of resources that shared mobility business models make to deliver their services must be lower than that product system's which is aimed to be substitute (Kjaer et al., 2018). One of the greatest criticisms that can be made to PSS or sharing platforms business models is the inexistence of references to take-back/end-of-life (EoL) systems (Kjaer et al., 2018) which may allow the firm to extend the life of their shared vehicles through repair, maintenance or reconditioning loops (EMAF, 2015b). The circular value creation logics that shared mobility systems operazionalize in their value propositions are mainly their business models capacity to maximize the productivity of vehicles through sharing, however not taking care of circular value creation and capture mechanisms through life-extending activities of vehicles through their life-span. A reason why PSS shared mobility service firms may not highlight possible life-extending activities in their value propositions as sustainable added value for customers could be explained by (Hartl et al., 2018)'s customer-focused study which results show that carsharing service users primarily care for cost-savings (compared to car ownership) and that the possible benefits for the environment are perceived as "a positive side effect" (p. 94).

Simultaneously, the potential negative counterpart of the growth of shared mobility service firms, is their competition and substituting potential with other 'more sustainable' transport modes – i.e. public mass transit systems, walking or biking. In this regard, Finger et al. (2017) assert that the growing yet small phenomenon of shared mobility does not have real chances to substitute mass transit transport systems. Particularly these authors observe the limited substitution effect of carsharing and ridesharing on mass-transit, existing a higher potential for bikesharing and ride-splitting. On the other hand, a majority of both private and public shared mobility systems are rather encouraging consumers to combine the use of mass and shared mobility services. Although the effect of these combined services through costumer-focus MaaS apps and platforms is overall promising for reducing the use of the private car in cities and counteracting the environmental depletion created by the massive and inefficient use of cars in urban environments.

5.2.2. Proposing the creation of new consumption behaviours based on cooperation and shared responsibility among consumers and service providers

This study has also shown in which ways shared mobility systems, enabled by ICTs, are proposing and encouraging the creation of consumption cooperative behaviours that may improve the customer experience in sharing the use and performance of shared mobility. This consumption practices are already taking place, particularly in shared platform platforms such as Uber, Lyft and Blablacar, showing that the future of shared mobility goes through greater involvement of the consumer in pre-, during-, and post-consumption processes and a greater cooperation in B2C and P2B2P markets.

The particular case of Mobike has also shown how some free-flouting B2C sharing systems are proposing rising the customers' jobs by translating further responsibilities over vehicles proposer use, which ultimately affect in the sharing system overall performance and in the customer experience. These policies answer some authors concern about the sharing economy's downturns, given that a greater use of resources through sharing may create greater depletion of resource and materials if these reach their end-of-life faster than those products within ownership-based consumption.

5.2.3. Validity and reliability of the method

The use of online ethnography for researching a phenomenon such as shared mobility provides both advantages as well as has limitations and counterparts. On the hand, it provides the researcher a great access to firms activities, value propositions and communications, obtaining a wide perspective of how value is aimed to be created together with the consumer. On the other hand, netnography provides a quite limited 'picture' a firms state and discourse, as the online environment is highly changeable and the platform through which firms propose value gain and loose reliability as soon as the target find them accessible, reliable and usable. Therefore, the main limitation of this method in this study is the reliability of the data used, as soon as firms have changed their goals and perspective about how to provide utility to customers through their shared services.

5.2.4. Concluding remarks and recommendations

Shared mobility service business models inherit a great potential to substitute car ownership as a more resource efficient and sustainable ways of producing and consuming urban mobility. The analysed shared mobility service firms' value propositions indicate that these business models propose personalised, customer-focused mobility, strongly supported and enabled by the integration of ICTs as the cornerstone of seamless interaction between the customer, the service provider and the physical aspects of the product-service offering, whether if it is a dock-less bicycle, a point-to-point carsharing scheme or an on-demand ridesourcing trip. Thus, these firms qualify their services as convenient, accessible, reliable and sustainable – this last value quality compared to the environmental performance of individual, private car mobility and the combined use of shared and mass-transit services.

It has been clearly identified that shared mobility service business models transformative potential in the urban mobility industry, as soon as they compete with and aim to substitute the ownership and consumption of private car mobility by delivering a set of value propositions that state the superior utility – in terms of convenience, accessibility and resource efficiency – shared mobility schemes provide over such ownership-based product systems. Indeed, various authors agree upon the potential of these business models to reduce car ownership (see e.g. Bondorobá and Archer, 2017; Finger et al., 2017; Santi and Ratti, 2017). Therefore the proposed positive effects on the environment and societies in terms of reduction of CO2 emissions, congestion, and potentials sustainable transformation of urban mobility and public space is plausible as long as these business models are able to maximize the use of products during their use phase with the consequent reduction of materials, energy and polluting emissions, as well as substitute those other less sustainable (or more resource consuming) mobility systems, which is something has not been yet established given the novelty of these business models in the market space.

Ultimately, some of the studied shared mobility service firms propose filling the gaps of mass-transit service, particularly regarding granting a access to door-to-door and first-/last-mile urban mobility to a wider population and, in the case of ridesourcing (Uber and

Lyft) and public bikesharing business models (BiciMAD) have already transited towards the integration of their services into MaaS platforms which reinforce the positive environmental impacts of multimodal urban mobility (Santi and Ratti, 2017) and the increasing potential to substitute car ownership (Finger et al., 2017). The promised sustainable value shows the path for private and public firms to cooperate towards the integration of mass and shared mobility systems which eventually can reduce the presence of private car out of the urban space.

Given the important role of shared mobility business models in contributing to a more resource efficient and sustainable urban mobility, firms should design shared mobility offerings that already integrate by design the exiting supply of mass-transit systems in order to coordinate efficiently a multimodal mobility that is able to fill-up the gaps of public transportation while each shared mobility services represent a possible alternative that fulfils the need of a determined segment while is primarily is to substitute private car use in a city. In this extent, observing the integration a shared mobility business model within a MaaS app or platform may allow to coordinate a combined creation of mobility offerings in between private and public entities, delivering coherent value propositions that allow fulfilling the demand of a cheaper, seamless and gap-less urban mobility.

Regarding the shown capacity of shared mobility business models to develop a circular value creation logic, the results show a narrow capacity of the studied firms to propose resource efficient value through different strategies. As expected, the sharing strategies enable these firms to slow resource loops by maximizing the utilization of products during their use phase. In this case, firms should be able to detect and minimize the possible environmental rebound effects (Goedkoop, van Halen, te Riele, & Rommens, 1999; Manzini & Vezzoli, 2003; Reim, Parida, & Örtqvist, 2015). In the absence of information about these business models EoL systems management, it is recommendable for those shared mobility business models integrating a PSS to introduce take-back systems into their business models (Kjaer et al., 2018) with the capacity to design circular activities for reusing, repairing and refurbishing those vehicles at their end-of-life, and thus recapture value from a circular management of resources.

Future research is proposed towards the integration of shared and public transit systems' combined value propositions.

6. APPENDIX

Protocolary questions applied to the online ethnographic research:

1. Which are the main Value Propositions delivered by Shared Mobility Service (SMS) firms?

1.a Which of these entail sustainability value?

1.b Which of these entail a resource efficient value?

2. Which are the benefits for the customers/users?

3. Which are the benefits for other stakeholders?

4. Are Traditional Mobility Systems (TMS) and vehicle ownership addressed in order to highlight/compare to the embedded value of SMS?*

5. Do SMS propose a sustainable development-related value for the cities/regions in which they operate? (This question and the data that has produced has not been taken into account for analytical purposes)

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