

Align, adapt or amplify

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Original Research Paper

Align, adapt or amplify: Upscaling strategies for car sharing business models in Sydney, Australia

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ABSTRACT

Since new business models may deviate from the current regime, they require protective spaces, called niches, for their development. The regime both enables and restricts opportunities for designing business models, thereby defining a ‘business model design space’ that can be dealt with in different ways for niche upscaling. We conducted a qualitative, comparative case study including two types of car sharing business models in Sydney. We focused on niche entrepreneurs’ upscaling strategies in enacting the niche business model design space and observed that entrepreneurs can align with the existing opportunities opposed by the regime. If there is a mismatch, entrepreneurs mostly adapt the internal organization part of their business model to re-align, or use their networks to ‘amplify’ the current business model design space. This leads to new business model designs and affects either company or niche. Sydney may serve as an example for other car dependent cities.

1. Introduction

Sustainable development has become a generally accepted goal of environmental policy: until 2000 economists predominantly applied neo-classical theories to environmental economic problems, but recent theories on sustainable development adopt a more evolutionary view. Based on these theoretical developments, transition studies emerged focusing on transformation towards a sustainable economic system (Mulder and van den Bergh, 2011).

A transition of a socio-technical system or regime constitutes changes on its various dimensions: cultural meaning, consumer practices, infrastructure, industrial networks, technology, scientific knowledge, and policy (Geels, 2002). Transitions may require new business models for sustainability that balance economic, ecologic and social performance (Boons and Lüdeke-Freund, 2013; Calabrese et al., 2018; Hannon et al., 2013; Schaltegger et al., 2012). Business models are frameworks that conceptualize value creation and capture by a focal company and its partners (Chesbrough, 2010; Teece, 2010; Zott et al., 2011). The emergence and growth of sustainable business models begs the question whether they can support transitions towards sustainability and in what ways. A recent study on the decarbonization of power systems found that business model innovation was essential to break the resistance to shifts towards sustainability, and accelerate the transition in line with the 2015 Paris Agreement on mitigating climate change (Wainstein and Bumpus, 2016).

This suggests there is merit in linking transition studies and business models research, but only recently researchers have started to explore the roles of business models for sustainable innovation and sustainability transitions (Bidmon and Knab, 2018; Bolton and Hannon, 2016; Ceschin, 2013; Huijben et al., 2016; Kuokkanen et al., 2019; Sarasini and Linder, 2018; van Waes et al., 2018; Walrave

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et al., 2017). There is a strong call for more research on strategic activities by niche entrepreneurs to enact the socio-technical system in place. The business model can be a means to operationalize such strategic activities (Casadesus-Masanell and Ricart, 2010; Zott and Amit, 2008; Zott et al., 2011).

The field of transition studies has thus far not explicitly considered the operationalization of business model strategies in sectors other than solar, nor for regime dimensions other than policy (Huijben et al., 2016). This paper, however, aims to do both through a case-study of car sharing business models in Sydney conducted in 2015. Sydney, Australia is a heavily car-dependent urban sprawl environment where the resistance to changing personal private automobility is strong in general (Wells and Xenias, 2015). This is limiting the upscaling of the prime example of the ‘collaborative economy’ in mobility: car-sharing (Plewnia and Guenther, 2018; Ertz and Leblanc-Proulx, 2018).

In this paper, we delve into niche entrepreneurs’ upscaling strategies in enacting the niche business model design space. The business model design space is defined as ‘the set of available business opportunities for niche entrepreneurs to enact’ and is shaped by the mainstream socio-technical system in place (Huijben et al., 2016). This enactment on business model opportunities could cause a transition towards a system where the collaborative economy becomes a leading strategy for mobility. Building on the above, the main research question for this paper is:

“How can car sharing niche entrepreneurs enact the business model design space, defined by the mainstream socio-technical system in place, and scale-up their business models?”

Our paper starts by sketching a theoretical framework based on business model literature and transitions studies. The methodology section elaborates on data gathering and analysis, after which we discuss the results of the case study in Sydney, highlighting the various regime dimensions and relating them to entrepreneurial strategic responses and business model designs. The results reveal three strategic responses: when enacting the available business model design space, niche entrepreneurs align, adapt, or amplify. The paper ends with the main conclusions and discussion of our findings along with suggestions for future research.

2. Theoretical background

2.1. Sustainability transitions: niche development and upscaling

A transition is a transformation from one socio-technical system to another (Geels, 2002). A socio-technical system has three levels: landscape, regime, and niche. A landscape constitutes the exogenous environment, including long term developments and external shocks (e.g. natural disasters). A technological regime is defined as

‘the rule-set or grammar embedded in a complex of engineering practices, production process technologies, product characteristics, skills and procedures, ways of handling relevant artefacts and persons, ways of defining problems; all of them embedded in institutions and infrastructures’ (Rip & Kemp, 1998, p. 338).

Often, these regime conditions do not match radical, more sustainable innovations. Thus, a long-term transition towards sustainable mobility starts with various limiting conditions that need to be overcome. A niche is a protected space in which technological and non-technological innovative experiments can take place (Kemp et al., 1998; Hoogma et al., 2002; Geels and Kemp, 2012). Niches are protected or shielded from mainstream selection environments, such as rules and regulations or infrastructures (Kemp et al., 1998; Schot and Geels, 2008). Niche shielding can take the form of governmental subsidies or incubator units in incumbent companies (Smith and Raven, 2012). This protection can help radical innovation gain enough ‘momentum’ to replace the regime’s existing routines and activities, a process called ‘niche accumulation’ (Geels, 2004).

Geels (2002) claims a transition can occur under three conditions. First, landscape pressures can weaken or destabilize regime activities, for example: natural disasters can increase awareness of global warming. Second, major shifts in economic structure may involve uncertain and irreversible changes, selection of existing alternatives, learning, errors in decision-making, and a persistent economic disequilibrium (Mulder and van den Bergh, 2011). Third, the regime’s destabilization of activities in multiple dimensions may open up ‘windows of opportunity’ for a niche innovation to break through and scale up (Geels, 2002).

Niche entrepreneurs can follow different upscaling strategies. The first is ‘fit and conform’, where radical changes in the mainstream selection environment are not required to convince the social world that the niche can be conventional and competitive. The second strategy is called ‘stretch and transform’ and requires major changes to the rules of the game in the mainstream system (Smith and Raven, 2012). Levidow and Upham (2017) show how the cognitive framings of niche entrepreneurs can either align with the existing regime or aim to destabilize or change it. Such strategies for transformation of the present socio-technical regime are very relevant for car sharing in Sydney, where niche entrepreneurs are trying to change the current private-vehicle dominated mobility regime. Below, we first discuss sustainable business models and business models for car sharing in particular, before examining the role of business models for niche upscaling. Business model innovation can play a significant role in this context (Bidmon and Knab, 2018; Bolton and Hannon, 2016; Ceschin, 2013; Huijben et al., 2016; Kuokkanen et al., 2019; Sarasini and Linder, 2018; van Waes et al., 2018; Walrave et al., 2017).

2.2. Sustainable business models

Business models are frameworks that conceptualize value creation and capture by a focal company and its partners (Chesbrough, 2010; Teece, 2010; Zott et al., 2011). Baden-Fuller and Morgan (2010) and Wirtz (2011) distinguish two roles for business models in relation to innovation. Business models can support the commercialization and strategic marketing of innovative processes, products and services (Teece, 2010; Zott and Amit, 2007, 2008). Alternatively, business models themselves can be subject to innovation by providing competitive advantages through changing the terms of competition (Chesbrough, 2010; Amit & Zott, 2015).

The Business Models for Sustainability approach emphasizes six major principles, namely: resource efficiency, social relevance, localization and engagement, longevity, ethical sourcing, and work enrichment (Wells, 2013). Sustainable business models are becoming increasingly important for science and practice (Lüdeke-Freund and Dembek, 2017). They create value for customers, society, and businesses (or: people, planet, profit) (Boons and Lüdeke-Freund, 2013; Hannon et al., 2013; Schaltegger et al., 2012, 2016a) To define them, we follow the definition of Schaltegger et al. (2016a):

‘A business model for sustainability helps describing, analysing, managing, and communicating (i) a company’s sustainable value proposition to its customers, and all other stakeholders, (ii) how it creates and delivers this value, (iii) and how it captures economic value while maintaining or regenerating natural, social, and economic capital beyond its organizational boundaries.’ (Schaltegger et al., 2016a, p. 6)

This is in line with the proposition that a more holistic approach to sustainable value should incorporate environmental, social, and economic value creation and include a long-term perspective (Calabrese et al., 2018; Evans et al., 2017; Patala et al., 2016). Balancing environmental, social and economic value creation is a very subtle exercise for companies to undertake (Melkonyan and Gottschalk, 2017). Additionally, while sustainable business models are often presented as contributing to these goals this is not necessarily the case. A literature review by Hofmann (2019) shows how theoretical notions of circular business models remain close to the current unsustainable business paradigm (Hofmann, 2019). Finally, Boons and Lüdeke-Freund (2013) define the sustainable business model as consisting of four key elements that can be tailored toward sustainability: Value Proposition, Customer Interface, Supply Chain, and Financial Model. We use these key elements for analyzing car sharing business models in Sydney (see Fig. 1).

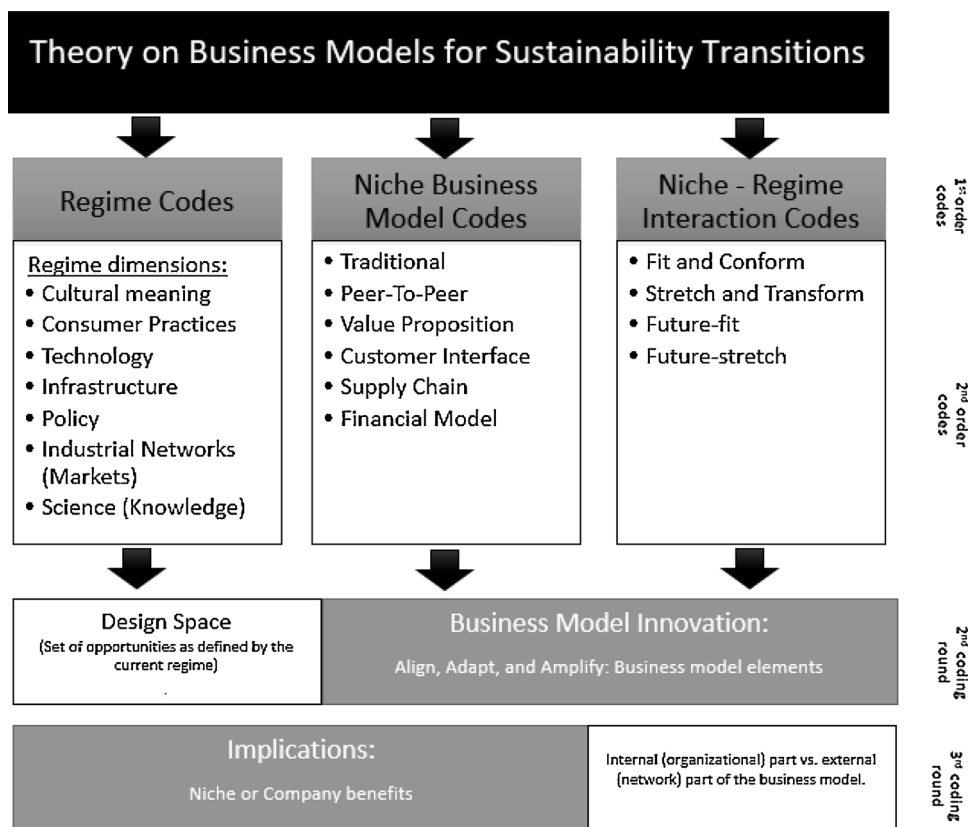


Fig. 1. Theoretical framework and axial coding scheme for data analysis (Gioia et al., 2013).

2.2.1. Car sharing business models

Business models for sharing resources have re-emerged over the past decade. During recent years, academic debate has sparked about the definition, structuration and categorization of the ‘collaborative economy’ (Ertz and Leblanc-Proulx, 2018; Netter et al., 2019; Ritter and Schanz, 2019; Ertz and Leblanc-Proulx, 2018). According to Botsman and Rogers (2010), collaborative economy initiatives have the potential to reduce resource use and greenhouse gas emissions, build social capital, and strengthen local economies. In their view new and distinctive business models aim to restructure or reorganize current systems, while working toward a more sustainable or environmentally friendly economy (Botsman and Rogers, 2010; Mouazan, 2013). However, the exact sustainability contribution of the collaborative economy is still unclear and now heavily debated by several scholars (Ciulli and Kolk, 2019; Frenken and Schor, 2017; Martin, 2016; Böcker and Meelen, 2016). Studies on the contributions of the collaborative economy to actual long-term sustainability benefits are scarce as well (Schaltegger et al., 2016b; Ertz and Leblanc-Proulx, 2018).

Car sharing is a key example of the collaborative economy. Cohen and Kietzman (2014) identified three unique types of car sharing business models. First, in the traditional business-to-consumer type (later divided into point-to-point or roundtrip – Lagadic et al., 2019; Bellos et al., 2017; Munzel et al., 2018; Munzel, 2019) a company acquires vehicles and supplies them throughout the city. Second, in the non-profit or cooperative type members collectively manage a car sharing organization. Third, peer-to-peer car sharing uses the web or mobile technology to mediate between vehicle owners and renters (Cohen and Kietzman, 2014). The first and third type were present in Sydney during the time of study (i.e. roundtrip only, see Section 3.1).

Car sharing is seen as an alternative for car ownership, which could ultimately enhance consumer and societal welfare by decreasing purchases for infrequent needs (Sprei and Ginnebaugh, 2018). However, sustainability benefits for car sharing are contested. Most empirical research on the benefits of car sharing has focused on the reduction of greenhouse gas (GHG) emissions in the United States or Europe (Jung and Koo, 2018; Namazu et al., 2018; Liimatainen et al., 2018; Chen, 2016). Based on a study in the San Francisco Bay Area, for example, Clewlow (2016) argues that the potential sustainability advantages of car sharing include significantly lower levels of car ownership, larger shares of lower emission vehicles among car-sharers who own vehicles, and fewer vehicle kilometers. The latter is crucial for improving sustainability, since lower numbers of automobiles do not automatically translate into fewer vehicle miles. Via a modeling exercise, the International Transport Forum (2015) has suggested that self-driving vehicles in Lisbon could reduce the number of vehicles in the city by 85 percent, but still increase vehicle kilometers by at least 6 percent and potentially much more.

Namazu and Dowlatabadi (2015) argue that researchers should look beyond factors such as GHG emissions or vehicle kilometers travelled and investigate car sharing in terms of factors involving behavioral change like mode shifting, trip planning, right sizing and other factors like utilization of newer automobiles and a reduction of ‘macho culture’ (like in Sydney – Dowling and Kent, 2015). Others stipulate that sustainable consumption goals can only be reached by combining car sharing with other modes of sustainable transport such as walking or cycling or by implementing sustainable technologies like electric vehicles in the car sharing fleet (Jung and Koo, 2018; Scarinci et al., 2017). A study by Chen (2016) suggests that despite the so-called rebound effect, car sharing provides a net saving of GHG emission of 3% across all US households. This research was conducted for cities with dense neighborhoods and good access to public transport. Neighborhoods in Sydney are less dense and the quality of public transport has not improved as much over the past decade, making the upscaling of car sharing business models more difficult (Dowling and Kent, 2015). This shows the importance of considering geographical aspects in different urban settings for the sustainability assessment of car sharing.

2.2.2. Business models for niche upscaling

Business models are one of the core constructs developed in niches (Bidmon and Knab, 2018; Ceschin, 2013; Huijben and Verbong, 2013; Sarasini and Linder, 2018; Wainstein and Bumpus, 2016). Both internal and external sources of inertia can limit business model innovation in niches, but experimenting with new business model set-ups may provide a way out and improve strategic and reflexive decision making (Huijben and Verbong, 2013; Sarasini and Linder, 2018; Bidmon and Knab, 2018). For example, business models for solar PV that provide financing as a service can (partially) remove the high initial investment barrier for customers and attract new customer segments (Drury et al., 2012; Huijben and Verbong, 2013; Rai and Sigrin, 2013). Walrave et al. (2017) examine innovation ecosystems in which multiple partners together develop one core value proposition for end users. In line with Huijben and Verbong (2013) and Sarasini and Linder (2018), they state that it is vital for the innovation ecosystem to conduct experiments that improve alignment with the regime. Niche organizations often lack sufficient resources to perform such experiments. Inter-organizational learning is a relatively inexpensive alternative that improves the external alignment of the innovation ecosystem (Walrave et al., 2017).

While these studies show promising avenues for further research and hypothesis testing, so far empirical investigation has been limited. Huijben et al. (2016) conducted one of the first studies in this field, investigating the interplay among the regulatory regime, niche upscaling strategies, and business model designs for solar PV in the Netherlands. The regulatory regime, consisting of mainstream market regulations and niche shielding through government subsidies, both enables and restricts the *business model design space*, which contains the set of business opportunities for niche entrepreneurs to enact. They found both fit-and-conform and stretch-and-transform empowerment strategies (see Section 2.1) for effectuating the business model design space. They also observed that such empowerment strategies related to the present time or the future (i.e. future-fit or future-stretch types) and affected particular parts of the business model. As such, the business model is a means of operationalizing the selected niche empowerment strategy,

which is in line with previous findings in management literature (Casadesus-Masanell and Ricart, 2010; Zott and Amit, 2008; Zott et al., 2011). However, Huijben et al. (2016) focused exclusively on the policy dimension of the regime.

Instead we choose to look at the interplay between niche business models and the existing regime by examining niche entrepreneurs' empowerment strategies for dealing with all seven dimensions that define the business model design space. In line with previous research, niche empowerment strategies and their related business model designs are expected to either maintain or expand the existing business model design space (Huijben et al., 2016). Schaltegger et al. (2016b) consider niche entrepreneurs as agents of change for sustainability. By innovating their business model and changing their core activities they can actively influence the socio-technical context in which they are embedded. Additionally, Ramos-Mejía and Balanzo (2018) show the importance of working with local actors and local resources for niche empowerment. This paper, therefore, contributes to the ongoing debate on the role of agency and power relations of actors in transition processes (Farla et al., 2012; Kern, 2015; Lopes et al., 2018; Ramos-Mejía and Balanzo, 2018; Schaltegger et al., 2016a,b; Sørensen et al., 2018).

By analyzing a different sector (car sharing business models) and geographical context (Sydney), we aim to both validate and expand previous research findings for the energy domain (Lagadic et al., 2019). In line with recent calls to explore the business model design, and the role of niche entrepreneurs in strategically enacting the socio-technical system in which they are embedded (Bolton and Hannon, 2016; Sarasini and Lindner, 2018; van Waes et al., 2018; Walrave et al., 2017), we study the business models of all five car sharing companies in Sydney to unravel related niche empowerment strategies for upscaling and transforming the present private-vehicle mobility regime.

3. Methods

The goal of the empirical investigation was to validate and expand the existing theory on upscaling of business models in sustainability transitions through an exploratory qualitative case study (Eisenhardt and Graebner, 2007; Yin, 2003). A hallmark of case study research is the use of multiple data sources to enhance data credibility (Baxter and Jack, 2008; Yin, 2003). The next paragraphs elaborate on the case selection, the data collection strategy and the coding procedure for data analysis.

3.1. Case selection

According to Meelen et al. (2019) the geography of socio-technical regimes is a very important indicator for the adoption of niche innovations, especially in terms of spatial heterogeneity (Meelen et al., 2019). Car-dependent cities are widespread, but few are as car-dependent as Sydney. Private automobility is the norm in Sydney, certainly for daily commuting. This imposes limits on an urban mobility transition. Urban sprawl is rampant and makes Sydney susceptible to 'transport poverty': those who cannot afford an automobile can only fulfil their mobility needs at high cost or by spending disproportionate amounts of time due to the lack of viable mobility alternatives. Distances are hard to overcome on foot or by bike and public transport has long been in decline. The dominance of private automobility results in challenges for car sharing implementation and upscaling (Gleeson and Randolph, 2002; Lucas, 2012; Rotaris and Danielis, 2018). Sydney is therefore an extreme case (Seawright and Gerring, 2008). If car sharing can work in the adverse conditions of Sydney, it may be easier in environments culturally and geographically less attuned to private-vehicle ownership (Rotaris and Danielis, 2018).

The business models in Sydney at the time of study were traditional (business-to-consumer) and peer-to-peer (consumer-to-consumer) car sharing. In 2015, Sydney had three traditional car sharing companies (GoGet, GreenShareCar, and Hertz24/7 or Hertz on Demand, formerly Flexicar), and two peer-to-peer ones (DriveMyCar and CarNextDoor). Recent literature on car sharing business models distinguish one-way and round-trip business model types within the peer-to-peer and traditional business models (Ferrero, 2018; Munzel et al., 2018; Munzel, 2019; Namazu et al., 2018; Nickerson et al., 2017; Perboli et al., 2018; Ritter and Schanz, 2019). All five companies operating in Sydney at the time of study were round-trip, requiring users to return vehicles to the pick-up location.

3.2. Data collection

Interviews with the CEOs of all five car sharing companies operating in Sydney in 2015 form the main empirical basis for this paper. All interviews were semi-structured (Drever, 1995). We extensively researched every company using existing interviews, news articles, company documents, and websites prior to the interviews. After some introductory questions, we asked the CEOs to map their business model, share their knowledge on the current regime for car sharing, compare the various types of business models in the market, and discuss future perspectives on car sharing (Appendix A contains the interview guide). A representative of Sydney City Council was asked the same questions oriented at the government's role in car sharing. Additional interviews were held with a car-sharing expert (towards future perspectives) and two customers for each business model (focusing on customer experience). At the end of every interview, snowballing was applied in order to find more interviewees or to check for missing relevant contact persons (Vogt, 1999). The procedure resulted in a total of eleven interviews. Furthermore, we have triangulated our findings by comparing interview statements with news articles (e.g. Ottley, 2014 in Appendix B), company websites, presentations, archives, reviews and twitter feeds. Triangulation is the establishment of validity by combining data collection methods thereby allowing for improved

Table 1
 Regime dimensions and their elements, empowerment strategies, and business model designs within the car sharing niche in Sydney for the two types of business models. Note that the selected strategy can be beneficial for the company as well as the entire car sharing niche.

Regime Dimension	Regime Element	BM Type	Aligned?	BM Element	Beneficial for	Explanation
Cultural meaning	Trust between peers & Property responsibility	P2P	Not aligned: adapted	Value Proposition	Company	Reputation system & Lock technology
	Property Responsibility	Trad.	Not aligned: amplified	Supply Chain	Niche	Create new kind of insurance
Consumer Practices	Car dependency	Trad.	Not aligned: adapted	Value Proposition	Company	Target customers with other (mixed) value base (incl. sustainability)
	Cars mostly used in weekends	Trad.	Not aligned: adapted	Customer Interface	Company	Extending customer segment
Infrastructure	'Old' car infrastructure	Trad. + P2P	Aligned	Value Proposition	Niche	Car sharing highjacks old infrastructure
	Insufficient Public transport	Trad.	Not aligned: amplified	Customer Interface	Niche	Lobbying for government fleet
Policy	Cycling infrastructure	P2P + Trad.	Aligned	Value Proposition	Niche	Cycling Improves health
	Lack of dedicated parking spaces	Trad. + P2P	Not aligned: amplified	Supply Chain	Niche	Increase dedicated parking spots
Industrial networks (Markets)	Tension among political parties	P2P	Aligned	Supply Chain	Niche	Being part of P2P community for marketing/focus
	Tax payment for cars	Trad.	Not aligned: amplified	Supply Chain	Niche	New car share tax regulations institutionalized
Technology	Market share Manufacturers	Trad. + P2P	Aligned	Value Proposition	Niche	B2C Buy 1 fleet (but still small market share) / C2C Utilizing used cars
	Competition from mainstream car rental company	Trad.	Not aligned: Adapted	Supply Chain / BM merging	Company	Acquisition car rental company (BM merger)
Science (Knowledge)	Car sharing website	Trad.	Not aligned: amplified	Supply Chain	Niche	Partner with Metavera to develop website
	Car lock technology (expensive)	P2P	Not aligned: adapted	Value Proposition	Company	Technological innovation within company BM
Science (Knowledge)	Lack of customer knowledge on sharing	Trad. + P2P	Not aligned: amplified	Supply Chain	Niche	Marketing campaigns with partners
	Lack of knowledge on driverless cars	Trad.	Not aligned: amplified	Supply Chain	Niche	Research on shared autonomous fleet by Knowledge Institutes

judgement (Merriam & Grenier, 2019).

3.3. Data analysis

All interviews were transcribed to enable data analysis. Coding was manually executed on the basis of structuring content analysis comprising theoretical classes (Creswell, 2009, 2014; Miles and Huberman, 1994). The theoretical classes are based on current literature on business models for sustainability transitions (e.g. Bidmon and Knab, 2018; Boons and Lüdeke-Freund, 2013), business model innovation (e.g. Zott and Amit, 2008; Chesbrough, 2010) and niche-regime interactions (Smith and Raven, 2012; Huijben et al., 2016). All interviews were double coded by two of the researchers involved (Saldaña, 2015). Secondary data was coded by one researcher and for triangulation of our research findings. The outcome of the entire coding process is discussed below and summarized in Table 1.

Fig. 1 illustrates the corresponding axial coding framework (Gioia et al., 2013). Axial coding is the process of relating categories and concepts (codes) to each other by combining new insights with theory (Gioia et al., 2013). We started with a broad coding round to identify the regime, the niche, and niche-regime interaction in our data. Appendix B shows a coded news article to demonstrate our application of the three main codes in the initial rough coding process (Gioia et al., 2013; Ottley, 2014). The next step was dividing these three coding categories into subcategories as second order codes: seven regime dimensions for the regime codes (Geels, 2002); the different business model elements for the niche codes (Boons and Lüdeke-Freund, 2013; Cohen and Kietzmann, 2014); and niche-upscaling strategies for the niche-regime interaction codes (Huijben et al., 2016; Smith and raven, 2012). This leaves us with three pillars of theoretical classes and their sub categories for further analysis.

In the second round of coding we firstly investigated the various regime dimensions to find that the different regime elements together define the business model design space available for car sharing niche entrepreneurs (Appendix B). Building on the niche up-scaling strategies described in the literature (Huijben et al., 2016; Smith and Raven, 2012), we then looked into the niche entrepreneurs' strategic response to each regime element. We found three strategies for dealing with the available business model design space in our sample: align, adapt and amplify.

During our final round of coding we focused on relating the various business model elements to the strategies found in the second round. These strategies (per regime element) are mapped along with the respective business model elements and summarized in Table 1 (for example: company X applies the adaptation strategy in order to re-align the value proposition with regime element trust). After Table 1 was compiled, we found that entrepreneurs mostly employ a particular part of the business model, depending on their strategy. Entrepreneurs enacted either the external value chain or the internal organization part of the business model. We also further specified whether strategies affected the individual company or the niche as a whole. The entire coding process involved multiple rounds, during which we iteratively defined categories by going back and forth between theoretical concepts and our interview data (Miles and Huberman, 1994). The outcome of this process is summarized in Table 1 and further explained in Section 4.

4. Results

This section discusses our main results summarized in Table 1. The first part specifies alignment, adaptation and amplification as the three empowerment strategies for niche entrepreneurs to enact the business model design space. The second part distinguishes situations where strategies benefit a single company, from those benefiting the entire car sharing niche. Geels and Raven (2006) claim niches have local and global dimensions (referring to e.g. niches within niches) and the boundaries are not always clear cut. For

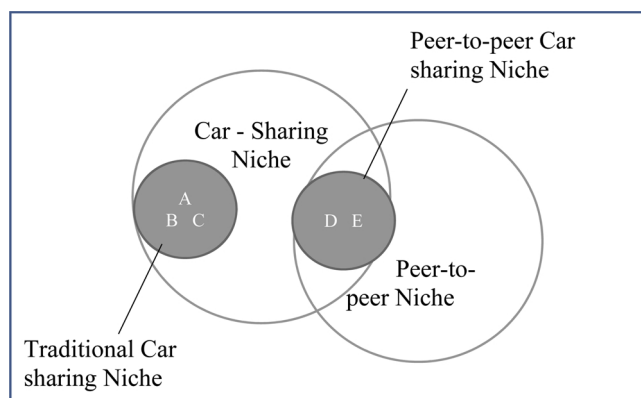


Fig. 2. Illustration of embedded car sharing niches based on Geels and Raven (2006). We researched three companies for the traditional niche (A–C) and two companies for the peer-to-peer niche (D,E).

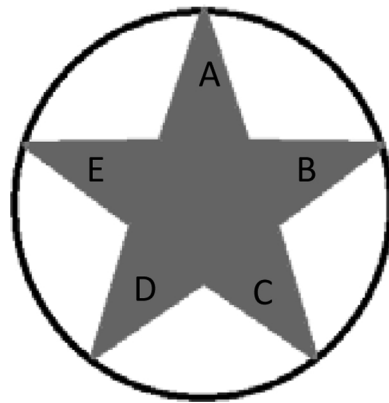


Fig. 3. The niche business models (A–E) aligned with the design space.

instance, the peer-to-peer car sharing niche is both part of the car sharing niche (including other car sharing business models) and the peer-to-peer sharing niche (with companies that provide platforms for sharing among peers), see Fig. 2.

4.1. Niche empowerment strategies and business model design

4.1.1. Business model alignment

To utilize the design space opportunities, companies can align their business models with the dominant regime. Fig. 3 presents the car sharing niche business model as a star combining the traditional and the peer-to-peer car sharing niche. Its five points (A to E) represent the company business models of the five interviewed companies. In Fig. 3, the niche business model aligns with the design space (i.e. the outer circle), which is in line with the findings of Huijben et al. (2016).

The current road infrastructure illustrates an alignment strategy. Because both types of car sharing business models make use of the current roads, traffic regulations and fuel stations, the Value Propositions of the niche business models align with the regime. According to a car sharing expert (EXP), with multiple scientific publications on car sharing in Australia since 2006:

“Car sharing kind of hijacks the infrastructure of the private car and sort of uses it from a morality of a public good” (Interview EXP JK, 2015).

Another example of alignment concerns cycling. Car sharing business models attempt to complement cycling infrastructure to improve public health through active mobility and vehicle use reduction. However, the lack of bicycle lanes in Sydney hinders complementarity of car sharing. So far, the car sharing companies have not taken any action against this, and so for now it remains an alignment strategy.

For the time being, the automobile manufacturers’ market share also concerns alignment, as the niche is still relatively small. However, if the car sharing niche expands (especially the traditional car sharing niche) some vehicle manufacturers may become preferred supplier for the traditional sharing companies, creating competitive advantages for those manufacturers and a threat for others.

The political tension among parties in the Australian government and Sydney City Council resulted in an unclear direction for enabling the development of the peer-to-peer business model. According to government (GOV) representative AM (2015):

“We found this really interesting tension going on among the local council thinking they need to regulate these car sharing organizations and then local councils thinking: no, this is a community good” (Interview GOV AM, 2015).

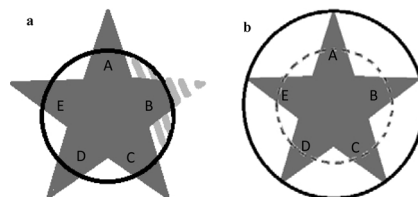


Fig. 4. (a) Non alignment: business model adaption. The business model of Company B is adapted from the grey striped form (star) to the grey form in the circle in order to fit in the available design space. (b) Non alignment: design space amplification. The business model expands the design space (i.e. dotted line to closed line).

However, at the time of study the peer-to-peer companies were self-supporting and thus did not need governmental help. Niche entrepreneurs were therefore not reacting to the tension and lack of unanimity, and at least temporarily aligned with the status quo.

4.1.2. Business model adaptation

If the business model does not align with the business model design space, it faces a barrier. One way to deal with it is to adapt the business model to fit to the design space (Fig. 4a).

An example of business model adaptation relates to trust between peers, a significant potential barrier for peer-to-peer car sharing (Botsman and Rogers, 2010). The two peer-to-peer car sharing companies in Sydney implemented a reputation feedback system and a new kind of locking technology, making the business model a tool that unlocks technological value to re-align with the current regime (Huijben et al., 2016; Sarasini and Linder, 2018). According to a peer-to-peer car sharing user (P2P User1):

“When there is a potential to lose your reputation ..., I think people just upgrade away to save their reputation as much as possible” (Interview P2P User1, 2015).

This change in Value Proposition is a form of business model innovation and results in adaptation of the peer-to-peer business model to fit the available design space. As the locking technologies for automobiles were expensive, one of the peer-to-peer sharing companies (CND CEO) developed its own:

“The [car locking] technology [used by traditional car sharing companies] wasn’t going to work for peer-to-peer car sharing because it is too expensive to put in. (...) we designed a whole new method of sharing (...) The Lock Box.” (Interview CND CEO, 2015).

Vehicle dependency is an important factor in Sydney. However, car sharing companies are now focusing their Value Proposition on a more sustainability-oriented Customer Segment (extension of the business model) and present their value proposition as environmentally friendly (also healthy, reducing traffic, etc.). Additionally, most automobiles in traditional car sharing are only used in weekends; on weekdays there is a shortage of customers. Car sharing companies in Sydney solved this problem by extending their customer segment and value proposition with a Business-to-Business (B2B) service, offered during the week.

Another type of adaptation, or rather changing the entire business model, applies to the competition with mainstream industrial partners. The acquisition of Flexicar by car rental company Hertz is a special case. This resolved the disadvantaged position in the competition with regime actors. According to the CEO:

“I would say that the biggest achievement was probably the acquisition by Hertz (...) the validation of a successful profitable car share model to be acquired... by a global corporate who realized that this stuff was going to become a mainstream option” (Interview FLEX CEO, 2015).

This involved ‘niche business model merging’ instead of adapting single components to match the existing business model design space (Schaltegger et al., 2016b). Hertz can be considered a large niche player, since the regime consists of private automobility. Flexicar’s business model continued to exist, only the name changed to Hertz 24/7 as part of the Hertz branding.

4.1.3. Design space amplification

Finally, niche entrepreneurs can amplify the opportunities offered by the current regime when facing a mismatch with the available design space (Fig. 4b). Consequently, the context in which the business model operates is moderated. Companies amplified by seeking acknowledgement for their company through collaboration with key partners in their network (Supply Chain element). We therefore prefer ‘amplifying’ over ‘stretching’ (Smith and Raven, 2012), because it literally means ‘to enlarge, expand’ and - in terms of sounds - ‘make something louder’, like making your company stand out when lobbying with key partners (Random House, Inc., 2010).

The lacking sense of responsibility for other people’s possessions is a cultural barrier for traditional car sharing companies. Cooperation with insurance companies has led to the creation of a new type of insurance for traditional car sharing companies that matches their Value Proposition. The insurance covers damage by third parties, thereby expanding the current insurance offerings and the available business model design space for the traditional car sharing niche (see Fig. 2).

Car sharing can complement public transport, which is relatively underdeveloped in Sydney. As one user of a traditional car sharing business model puts it (TD User1):

“I don’t need to commute by car and I can use a train to get into the city, but there are times when I need to do it quicker or I need carrying space and therefore having an option of a car sharing system is really beneficial for me.” (Interview TD User 1, 2015).

In 2015, three traditional car sharing companies in Sydney successfully lobbied and partnered with the city council to establish a governmental sharing fleet that would complement and support public transport in the city. This opened up new business opportunities for the companies, thus amplifying the available business model design space for the traditional car sharing niche (see Fig. 2).

Limiting parking spaces is a way to increase car sharing in the city center. A large part of the legitimacy and necessity of car sharing is claimed through its ability to reduce parking congestion, which is more prominent when parking places are scarce (Dowling and Kent, 2015). Exclusively reserving parking spaces for shared vehicles would further boost their implementation. After

lobbying by a traditional car sharing company, the city council decided that newly built apartments in the city center would have limited spaces available and that those would be dedicated to car sharing. There are also examples of peer-to-peer sharing companies partnering with a parking garage owner to assign dedicated parking spaces for car sharing. All of these provide new business opportunities for niche entrepreneurs.

The Australian government now also regulate tax payments on automobiles, creating an advantage for car sharing inhabitants: users can split the tax over those sharing the vehicle, thus lowering the costs. The cooperation with the government to make new regulations is a form of design space amplification.

Other partnerships were also very beneficial for amplifying the existing business model design space and creating new opportunities for niche entrepreneurs. For example, a traditional car sharing company partnered with a company called Metavera to develop a new, previously non-existent website providing a unique platform for car-sharing technology solutions (including mobile applications) and fleet management. Furthermore, a car sharing company and some knowledge institutes (e.g. the Institute for Sustainable Future of the University of Technology in Sydney) collectively researched the possibility of a shared autonomous car fleet to expand the knowledge base on car sharing in general.

4.2. Level of response effectivity

The innovation of business model elements has had different outcomes within the (peer-to-peer and traditional) car sharing niche. We distinguish a company level and a niche level effect (see Fig. 2 for the overview of niches). In other words, some business model changes are beneficial to all the car sharing companies within the niche, and others only benefit an individual company.

As Table 1 demonstrates, several empowerment strategies only benefit the company that initiates the business model innovation. Such measures have minimal or no impact on other companies in the same niche. For instance, when car rental company Hertz acquired Flexicar, the resulting competitive advantage was only for that company because Flexicar could build on the reputation of Hertz under the name ‘Hertz 24/7’. This is a unique example since the acquisition of Flexicar does not imply business model innovation by a niche company, but rather a complete business model take-over by a regime player (see Table 1).

Another example is the development of a feedback reputation system to create trust between peers by one of the studied companies. If a company develops its own system, this is part of its own business model innovation (i.e. technological innovation and business model innovation are interdependent (Boons and Lüdeke-Freund, 2013) and only affects that company. However, if multiple peer-to-peer sharing platforms in other sectors (e.g. housing, task sharing) adopt this feedback reputation system and it becomes a technological feature inextricably linked with the image of peer-to-peer sharing overall, the whole peer-to-peer sharing niche (Fig. 2) could benefit. According to a car sharing expert (EXP JK):

“Technology is enabling all sorts of things... it is enabling the trusting to be established, it is enabling the communication, it is enabling the diversification of business models...” (Interview EXP JK, 2015).

The amplification strategy encompasses characteristics that can benefit the entire car sharing niche. Fig. 4b illustrates the expansion of the business model design space. A typical example is third party insurance, established to enhance trust in a company and responsibility for property. Because an insurance company is free to provide this type of insurance to all car sharing companies, it benefits the entire car sharing niche (Fig. 2). Furthermore, in the areas of infrastructure and politics, the business model design space amplifies in favor of the niche through changes in regulations. One of our research findings is that when partners are involved (Value Chain business model element), this often leads to profit for the entire niche. The only exception is Hertz’s acquisition of Flexicar.

The car sharing websites provided by Metavera are an enabling technology that benefits the entire car sharing niche (including

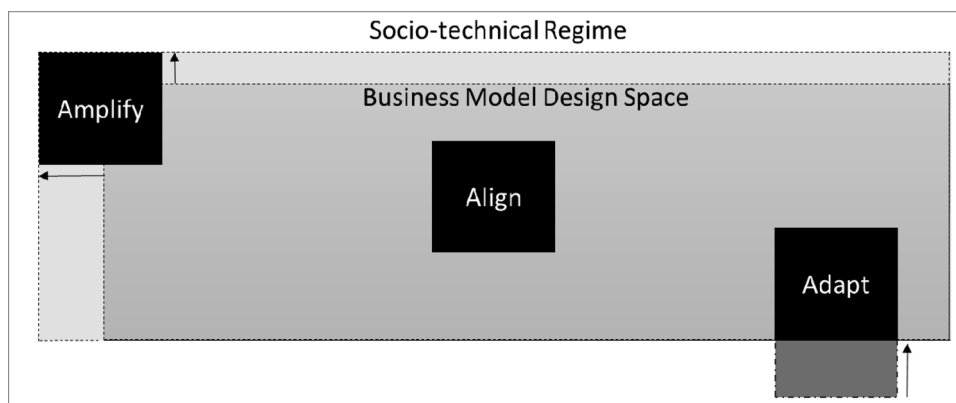


Fig. 5. Three strategies for dealing with the available business model design space: Align, Adapt and Amplify.

the traditional and the peer-to-peer car sharing niche). The websites are dedicated to car sharing companies, so when a car sharing company partners with Metavera, it becomes easier for other companies to connect as well. Additionally, marketing increases customer knowledge about car sharing, which is stimulated through partnerships (such as becoming part of a peer-to-peer community) within the peer-to-peer niche. Moreover, if one traditional car sharing company's collaboration with knowledge institutes to investigate a shared self-driving fleet has a positive outcome, this could benefit the entire business-to-consumer niche.

5. Discussion and conclusion

This paper aims to enhance the link between business model theory and sustainability transitions literature. Though sustainability assessment of car sharing is beyond the scope of this paper, it is important to ask the question whether car sharing should be considered more sustainable than customary forms of private vehicle ownership and use or other forms of mobility. Because the urban sprawl makes other sustainable mobility modes less feasible in Sydney, car sharing may actually be one of only a few options to decrease the use of private vehicles and facilitate a change towards a different mobility system. The acquisition of Flexicar by the more mainstream car rental company Hertz could foster further upscaling, but the long-term sustainability benefits ultimately depend on multiple factors including behavioral changes of Sydney's citizens. We therefore encourage comparative research to develop a firmer grasp on factors explaining the differences and similarities in business model upscaling patterns and sustainability impacts across a range of different geographic settings.

This paper aims to contribute to ongoing debates about the role of business models for sustainability transitions. Our focus on business models generated new insights into the strategic activities of niche entrepreneurs enacting their socio-technical environments thereby linking the company and system level. We contribute to ongoing debates on agency in socio-technical transitions. Strategic decision-making processes provide an interesting avenue for further research, for example on motivational aspects or potentially conflicting strategies (Huijben et al., 2016; Janssen and Moors, 2013). We believe that the business model design space together with the noted strategies (as presented in Fig. 5) provide a valuable framework for niche entrepreneurs to assess their sustainable business model design in light of current transition processes at the system level. This can support strategic learning and experimentation processes in companies striving to upscale their sustainable business model (Bocken et al., 2018, 2019; Sarasini and Linder, 2018).

This study also demonstrates the importance of combining technological and sustainable business model innovation. Technological innovation (e.g. the lock technology) proved to be an important prerequisite for improving car sharing business models in Sydney. The interplay between technology and business model innovation is an interesting topic for further research in the field of the collaborative economy. For example, new transportation technologies like drones can form the basis for developing new service-based sharing business models (e.g. for the delivery of parcels).

We focused on the niche empowerment process initially defined by Smith and Raven (2012) as either niches being compatible with the current regime (and therefore being able to scale-up) or niches that alter the current regime for the purpose of upscaling. Huijben et al. (2016) build on these concepts by studying such strategies for the solar PV niche and relating them to business model design. They found entrepreneurs to fit and conform or stretch and transform to the status quo and also anticipate future changes. Similar to previous work by Huijben et al. (2016) we found that some car sharing companies in Sydney already focused on the future, which was reflected in their strategy (e.g. lobbying a state fleet and partnering with research institutes in order to prepare for a future with an autonomous vehicle fleet). This study shows however that strategies are not only related to the policy dimension of the regime but also to other dimensions such as culture or existing infrastructures. Different strategies were found for each of the regime elements resulting in a diverse set of strategies enacted by the niche company. We thereby expand the notion of the business model design space as defined by Huijben et al. (2016).

We furthermore employ a novel approach on business model strategies: align, adapt, or amplify. We focused specifically on the business model components that are utilized to deal with the business model design space. Depending on the choice of strategy, niche business model designs were found to be different. For the align and adapt strategy we found that the internal organization and value proposition part of the Business model is altered, whereas amplification was found to be enacted by making new partnerships (through the external value chain of the business model). The distinction in strategy by the employment of specific business model components was not explicitly made in previous literature. We thereby also contribute to a further understanding of how exactly these strategies can be operationalized at the business model level. Another new finding in this study is the distinction that can be made based on the implications of the respective strategy, summarized in Table 1. In the case of adaption, changes were found to affect the focal company only, while the amplification strategy benefited the niche as a whole.

Finally, this study both expands and confirms the juxtaposition in active employment of a business model strategy, already slightly hinted upon in Huijben et al. (2016). In their study, stretching or transforming the business model design space was seen as an optional strategy and fit and conform was likely to be present anyway. Our sample indicates that while some of the selected strategies are deliberately chosen by niche entrepreneurs (e.g. lobbying the government as amplification strategy or implementing a new locking technology through adaptation), others are more passive in character (e.g. aligning to existing road infrastructures).

Appendix A

Interview guide for CEOs and general managers of car-sharing companies

Interview 5 CEO's of different car sharing businesses and ask for:

- Their views on current barriers and opportunities for car sharing
- The value proposition of car sharing
- A comparison between their business and other car sharing business models
- Their future perspective of their business

Introduction: – 5 min

- Introduce myself
- Explain the goal of the research project and interview
- Thank the interviewees for their time.
- Explain how data will be handled and published. Indicate option for 'off the record' answering (not taped or transcribed), checking of transcripts and final report by the interviewee. Request permission to publish their names in the final report.

General Questions: – 5 min

What is your role and function within the company?
How long have you been working for the company?

The Core

Describe your business model. What does the regime look like (what is already established/what are the barriers)? What is the company doing to develop car sharing (attract funding, partnerships, strategies, focus groups, competition)? How do they see the future of car sharing?

- A: The Business Model – 10 min

Try to fill in the business model canvas beforehand.

- Question 1: describe the core of the business model; how do you create and capture value? What extra services do you offer?
- Question 2: customer segment; what problems are you solving? How does car sharing benefit society, the economy and the environment?
- Question 3: How does the company deal with cash flow?
- Question 4: What are the key activities and resources?

For Key Partners > go to network

- B: The Network – 10 min

- Question 5: What is the government's role? (Local and National)
- Question 6: Who are your company's competitors? (Car sharing companies, private-owned cars)
- Question 7: Where do you get your resources?
- Question 8: Are there any sponsors/investors involved? Who?
- Question 9: Do you partner with knowledge institutions to continue learning? Which ones?
- Question 10: What about the media, pressure groups, environment activists, etc.?

- C: The Regime – 15 min

- How does the current way of thinking (culture/symbolic meaning) enable or constrain the development of your car sharing company?
- How are current technologies constraining or enabling development?
- Are markets and user relations constraining or enabling?

- How is the current infrastructure constraining or enabling the development of your car sharing company?
- To what extent are current policies and regulations constraining or enabling?
- Is the science and current knowledge base constraining or enabling?
- How do other business models (B2C or C2C) constrain yours?
- What barriers have already been overcome?

- D: *The future – 10 min*

- What strategies does your company apply to overcome barriers or make use of the opportunities provided?
- Where will your company be in 10–20 years?
- How do you see the future compared to other business models (B2C or C2C)?
- Which of your key partners can help your company reach that future?

Wrapping up: what have I left out? Who should I talk to (snowballing)? – 5 min.

Appendix B

See [Tables B1 and B2](#).

Table B1

News article examples of 1st order coding process; classification in niche, regime, and niche-regime interaction (Gioia et al., 2013; Ottley, 2014).

Regime	Niche	Niche-Regime Interaction
'Owning a car has been a symbol of achievement for generations. It gave Aussies, especially young ones, the freedom to explore the world without being tied to public transport (or mum's taxi service).'	'These new companies offer the convenience of a car when you want it, without the cost and related hassles (parking, insurance, maintenance, etc.) of actually owning a car yourself.'	'That has opened the door for car sharing schemes to infiltrate Australian roads'
'Cars are now seen by many as an inconvenience, an unnecessary expense or both. At the very least, owning your car is seen as a luxury some of us can no longer afford. Either financially or conveniently within our lifestyle.'	'Car sharing, for those unfamiliar, is effectively short-term car rental, in most instances with hourly rates. And instead of being located at a central location the cars are spread across the city allowing users (who have registered with the relevant company) to simply walk up and drive away.'	'For inner-city dwellers, often faced with increasingly limited and expensive parking and insurance costs, these car sharing companies have been well received in Australia, with more than 50,000 members signed up across the country.'
'"Parking is expensive, insurance is expensive in the inner-city, fuel is a pain to get in the inner-city too", he explains'	'The biggest player by far is GoGet, which... 'Green Share Car is newer ... Hertz 24/7 (and Flexicar) is part of the traditional rental company's expansion ...'	'Although the numbers in Europe and America are significantly higher there is no questioning car sharing is on the rise in Australia.'
'But doesn't it feel strange seeing someone you don't know drive off in your car?'	'He says there are several GoGet cars within walking distance of his apartment so the burden of owning and maintaining his own car stopped making sense to him.'	'DriveNow is a partnership between BMW and German car rental company Sixt that has a fleet of BMWs and Minis available for hire.'
'"You've got residents that need cars on the weekend but business need cars during the week," Jeffreys says.'	'As well as using the cars for trips to the beach or work within Sydney being a GoGet member also grants him easy access to cars whenever he travels.'	'According to GoGet co-founder Bruce Jeffreys one of the biggest breakthroughs for car sharing in Australia has been its integration into new residential developments, and he sees that as playing a big part in any future growth.'
'..the rest of the world selects a car to suit their need from the smorgasbord of wheels in their apartment basement'	'Basically, owners can register their car with Car Next Door and user can find their nearest free car and rent it by the hour, similar to GoGet. But the difference is the owners of the cars are able to pocket a percentage of the profits and Car Next Door doesn't have to invest capital in buying his own cars.'	'And he hopes that Central Park is just the beginning with more residential developments, as well as public infrastructure – such as train stations and universities across Australia – creating dedicated super pods for car sharing companies.'
'If we are to seriously address Sydney's choked roads and the frankly archaic belief that everyone needs a car...'	Car Next Door CEO Will Davis says the company does have a strict vetting process for potential users including an assessment of their driving history and credit check.'	'But it's not just the private car sharing companies looking to get involved in corporate action. BMW Australia is in the process of establishing its own program down under with plans underway to create a hub of BMWs in a centralised business park that would allow multiple companies to utilise the same fleet of cars.'

Table B2
Initial results of 2nd order coding: the regime dimensions and their elements as found in the interviews with companies, a car sharing expert (JK) and a governmental representative (AM).

Regime Dimension	Regime Element	Exemplar Quote	Interviewee					
			CND	DMC	GG	GSC	AM	JK
Cultural Meaning	Trust between peers	So a lot of the online platforms that rank and provide for people and take feedback to car sharers and lenders and borrowers, that peer-to-peer model, I think contributes to overcoming that sense of distrust (Interview EXP JK, 2015)	CND	DMC	GG	GSC	AM	JK
	Lack of responsibility feeling for the car	We provide insurance for the customers. You actually can't rent your car out in Australia yourself because you aren't covered by your insurance company for third parties. It is nice and effective for our customers. (Interview DMC CEO, 2015)		DMC		GSC		
Consumer Practices	Car dependency	"There are a lot of cultural things in our society around valuing of ownership and that idea of having that right to own a car. We have a very strong sense of that it is our right to be mobile by a private car in Australia, that is like having a right to breathe or something. Like freedom." (Interview EXP JK)		DMC	GG		AM	JK
	Cars mostly used in weekends	"the bottom line is that the first two demographics [singles and families] only want or tend to want a car on the weekend and that is only 2 out of 7 days in the week and you got those assets there that are not being utilized." Interview FLEX CEO, 2015)	CND		Flex	GG	GSC	
Technology	Car lock technology (expensive)	"The [car locking] technology [used by traditional car sharing companies] wasn't going to work for peer-to-peer car sharing because it is too expensive to put in. We designed a whole new method of sharing. The Lock Box." (Interview CND CEO, 2015).	CND		Flex	GG	GSC	
	Car sharing website	"There are very few car sharing companies that have their own technologies ... So Metavera is a guiding company that supplies the technology to many many countries." (Interview GG CEO, 2015)		DMC	GG	GSC		JK
Infrastructure	'Old' car infrastructure	"Car sharing kind of hijacks the infrastructure of the private car and sort of uses it from a moral of a public good" (Interview EXP JK, 2015).		DMCMC	Flex			JK
	Insufficient Public transport	"Because land was cheap and plentiful after the second world war we weren't forced to make our cities bigger but we just made our cities thinner we just spread them out, which is an environmental nightmare and transport nightmare." (Interview GOV AM, 2015)			Flex	GG	AM	JK
Policy	Cycling infrastructure	"We found that people who use car sharing travel less by car they are more likely to walk and cycle places and more likely to use public transport and there is a lot of health benefits associated with that." (Interview EXP JK, 2015)			Flex	GG	AM	JK
	Lack of dedicated parking spaces	There is a need for the provision of car parking spaces, in Sydney there is a lot of community opposition to the provision of parking spaces that will undo the network I think it is important that we have regulations that stipulate how spaces are allocated and a minimum amount of spaces need to be allocated (Interview EXP JK, 2015)	CND	DMC	Flex	GG	AM	JK
Industrial Networks (Markets)	Tension among parties	"There are a lot of elect officials who don't believe that we should be supporting car sharing with spaces on the street. It is really strange but here like many places in Australia and the US and England it is very politically polarized so to say there are very strong greens and there are very strong reds." (Interview GOV AM, 2015)			GG		AM	JK
	Tax Payment for cars	"We are meeting with the government in terms of actual policies for us we have only just started bringing in tax regulations, things like that. Where there can be some uncertainties around the customer when the companies need to pay tax we have to work that out." (Interview DMC GM 2015)		DMC				
Science (Knowledge)	Market share manufacturers	"The peer-to-peer model has more benefits in terms of it being easier, an easier model to establish—particularly in lower density areas - than the traditional model because you know you don't have to have this massive investment in this fleet of cars, you don't have to negotiate with local councils to get parking spaces and that sort of stuff and that's the thing. (Interview EXP JK)			Flex	GG	AM	JK
	Competition from mainstream car rental company	Other companies are just like yeah have all the data that's fine, but for some reason GG is more closed and guarded... they are more competing with GSC or Hertz. They have got every right to be a bit protective I think. (Interview EXP JK, 2015)		DMC	Flex			JK
Science (Knowledge)	Lack of knowledge on driverless cars	"We look ten years ahead. What that means is that we are doing activities that no one of business is doing. We have a one million dollar research and development partnership with the local university to develop driverless cars." (Interview GG CEO, 2015)		DMC	GG		AM	JK
	Lack of knowledge about car sharing	We don't really need anything from the government, we don't need their approval so really the only thing we need from the government is you know potentially letting people know about us, you know like marketing. Spreading the word and stuff like that. (Interview CND CEO, 2015)	CND		GG		AM	

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