

Mapping sharing economy in Brazil: A typological configurational study about business models of Brazilian companies

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Abstract — Sharing economy has emerged in the last years as a disruptive approach to the traditional way of planning, modeling and making business between companies and people. This phenomenon earned a significant leverage in a wide gamma of domains, including entrepreneurship, innovation, technology and management in its widest ways. Although this trend and interest, academic and marketwise speaking, there's a lack of a deepest research of its different views, such as ontology, technological facilitators, social boosters (consuming behavior) and mainly in the rising diversity of business models in shared economy and its implications to business growth, community impact, sustainability and public politics. Most part of the existing researches are concentrated in the international scope. On the other hand, the subject is still very immature in Brazil, reflecting itself in shallow researches. Thus, this research aims to leverage a rigorous comparative methodology, the fs/QCA (Fuzzy-set Qualitative Comparative Analysis), to evaluate business models from 12 Brazilian companies inserted in the sharing economy in Brazil. Taking advantage of a rich set of qualitative data extracted from existing researches and other publications, this research investigates the attributes of business models in the sharing economy, revealing by the end a unique typological configuration that represents the constellation of business models of the companies within Brazil's sharing economy business scope. Emerging dilemmas and paradoxes are explored, as well as the implications of business models for startups, researches e other interested parties in the context of sharing economy in both national and international scope.

Keywords—Business model, Collaborative Economy, Sharing Economy.

I. INTRODUCTION

The sharing economy has emerged in recent years as a disruptive approach to traditional business-to-business (B2B) to business-to-consumer (B2C) models. The businesses based on sharing have evolved from simple peer-to-peer (P2P) lending initiatives to complex platforms and networks of people and businesses that interact for the collective use of new or existing resources. It ranges from shared, decentralized and self-organized urban agriculture, to shared scientific development around the world.

In Brazil, the sharing economy is an expanding reality and its effects, to a greater or lesser extent, are already being felt in several segments. A survey carried out in 2017 by the Credit Protection Service (SPC BRASIL) and by the National Confederation of Shopkeepers (CNDL) in all capitals of the country reveals that Brazilians are increasingly adept, interested and integrated in the sharing economy (Collaborative consumption in Brazil, 2017). The

referred study demonstrates that the most popular and used methods of collaborative consumption by Brazilians are houses and apartments rental in direct contact with the owner (40%), ride to work or college (39%) and clothes rental (31%).

However, what does Sharing Economy mean? McLaren and Agyeman (2015), Martin et al. (2015) and Chase (2015) define the sharing economy as a socioeconomic system that allows an intermediary set of exchanges of goods and services between individuals and organizations that aim to increase efficiency and optimization of underutilized resources in society.

For Cohen and Muñoz (2017), the sharing economy keeps the promise of a more sustainable world, giving access to underutilized resources at a fraction of the cost for some who cannot or do not want to buy new products, and the chance to generate extra income for those who already have such underutilized resources. According to

Koopman, Mitchell and Thierer (2014), Botsman and Rogers (2010) and Lobel (2015), the sharing economy does not have a universally standardized definition.

The value of the sharing economy and businesses based on sharing, in this context, lies beyond the potential economic benefit for the main participants in this movement. In fact, this vast field has lacked a unified definition not only of the meaning of sharing economy, but also how companies operate in this context and how they are set in terms of typology.

One of the tools to support the logic behind the business and reveal the way a company is operating is the structure of the business model. The business model explains how a company creates, delivers and captures value (OSTERWALDER & PIGNEUR, 2010), describing the main elements of the business. In addition, there are indications of the successful relationship between sharing economy companies and their business models (WEBER, 2014; DYAL-CHAND, 2015; COHEN & KIETZMAN, 2014).

Despite the growing complexity of the phenomenon, most media and emerging studies seem to tar all sharing activities and companies, in particular, with the same brush, assuming that a one-size business model is equal to all.

Thus, the objective of this study is to present a typological configuration that characterizes the business models of companies introduced in the sharing economy in Brazil, based on the study of business models of 12 Brazilian companies.

II. METHODOLOGY

By examining the underlying conceptual structure of a sharing economy business model and how the different attributes of that structure combine to produce different sharing economy business models, this research was divided into four stages.

First, a review of the existing academic and complementary literature was carried out in order to analyze and identify the inherent characteristics of a business introduced in the sharing economy. Within this bibliographic context, the study on typologies of sharing economy business models extracted from Cohen & Muñoz (2017) was used as a reference in the methodological application.

When dealing with the complex variety of characteristics on which sharing economy business models emerge, from a combinatorial origin, the authors rely on the notions of multiple-cyclical causality and construction

of typologies (AUS, 2009; DOTY, 1994), departing from an analysis of seven attributes or conditions and recognizing that sharing economy business models necessarily emerge from several different combinations of these conditions, and that each of them represents an ideal type, causally connected and constituting a particular way of sharing business.

The second stage comprised the definition of the sample and data collection, opting for qualitative research. In order to better understand so many emerging business models, a series of secondary data were collected and analyzed from 12 different Brazilian companies, randomly selected, each representing a category of sharing activity derived from the Honeycomb v3.0 framework (Owyang, 2016). The Honeycomb v3.0 model seeks to describe a holistic representation of the different sectors of the economy being interrupted by start-up and established companies, using sharing economy approaches.

Since linear modeling and the recognition of case-based patterns are limited to deal with complex causality, a Fuzzy-set Qualitative Comparative Analysis (fs/QCA) was conducted, which is a theoretical method of sets of a member of a family of analytical techniques designed to visualize and analyze the causal complexity, maintaining the richness of the case data (RAGIN, 2008). The use of Boolean algebra and fs/QCA counterfactual test allows for a unique set of tools to perform configurational comparative analyzes of the many potential causal combinations of conditions that lead to a single outcome, and then to derive an equifinal set, although parsimonious, of possible causal settings of factors that explain the many structures underlying the sharing of business models.

The third stage included the analysis and interpretation of results based on the applied fs/QCA method. In this stage, the membership rules of the studied cases were defined (calibration of the collected data with the conversion of the answers in degrees of belonging), the causal configurations and outcome, necessary conditions and sufficiency, consistency and coverage, thus generating the typological configurations.

Finally, in the fourth stage, the study presents the conclusions and final considerations, bringing an insight into the configuration traced that characterizes the business models of companies in the Brazilian sharing economy. Seeking to unravel issues regarding the types of business models of the sharing economy in Brazil, the present work starts from an empirical structure and a definition of sharing economy defined by Kumara, Lahiria & Dogana (2018) to inductively understand a new scenario with the same intensity.

III. RESULTS

As a result of an extensive review of the existing literature on sharing economy and business models, highlighting the work of Cohen & Muñoz (2017) and Kumara, Lahiria & Dogana (2018) as key points of reference, as well as considering thought leadership emerging in the sharing economy, it was possible to identify seven distinct dimensions of sharing economy business models: 1) collaboration platforms, 2) underutilized resources, 3) peer-to-peer interactions, 4) collaborative governance, 5) targeted missions, 6) alternative financing and 7) technology dependence.

Comparative studies require the definition of causal and outcome conditions. In the elaboration of typologies, it can be done by using a constant of 1 as an output variable (KENT, 2008) under the assumption that all cases are part of a homogeneous group relevant in theory, or by identifying a shared definition resource within a non-theoretical selection of cases. In the first case, we could assume that the Honeycomb 3.0 model is theoretically stable and that the cases within that model were purposely selected based on several criteria. Under this methodological choice, the development of the typology would have to be based on the analysis of the truth table, since no counterfactual analysis or logical minimization is possible in the absence of positive and negative cases. As the Honeycomb v3.0 model and the complementary references described are not informed by the theory and an analysis of the truth table would represent only the total complexity of reality, restricting the development of a more parsimonious solution, it was decided to continue with the last alternative.

Here, the evidence has been tested against two points. First, which of the seven conditions can potentially be considered as an output variable, and second, which one is the most prevalent in the sample, even though it exhibits a certain degree of variance. Based on the literature review, it was observed that platforms for collaboration, underutilized resources and peer-to-peer interactions are used interchangeably and can potentially play both roles. Kohler (2015) and Chase (2015) support this. Thus, it was decided to follow the same logic by which a very necessary condition can be excluded from a configurational analysis after being considered redundant, defining collaboration platforms as the result for the analysis of the configuration and subsequent development of typology (COHEN & MUÑOZ, 2017).

Collaboration platforms (PLATFORM) is the result condition and measures the extent to which the company depends on a digital or physical platform for collaboration

(user to user or company to user) when offering its products and services. Underutilized resources (RESOURCES) capture the degree to which resources are shared by users and the business's dependence on excessive resource capacity. Peer-to-peer interactions (INTERACTION) capture the types and relevance of interactions and transactions between partners and seek to assess the extent to which the business model allows and/or trusts them. Collaborative governance (GOVERNANCE) assesses the extent to which the business is open to integrating users into value creation activities and benefits. When looking at the mission statement of the business and how it is implemented, the Mission oriented (MISSION) seeks to capture how central the social and environmental values and impacts are in relation to the economic value and the business as a whole. Financing sources (FINANCING) assess the extent to which the business uses or prioritizes alternative financing, such as donations, crowdfunding, equity-based crowdfunding or similar, through the different stages of the entrepreneurship process. Finally, confidence in Technology (TECHNOLOGY) captures the extent to which the business leverages or depends on technology to operate. Specifically, it assesses how the company uses technology to explore, for example, social networks, peer-to-peer interactions, user-generated content and mobile connectivity.

Calibration is essential in comparative configurational studies. It allows for comparability when resizing measurements in membership scores. Using a simple estimation technique, the calibration procedure transforms the gross scores of the variables into degrees of membership (RAGIN, 2007), resizing the original measurements in scores ranging from 0.0 (for complete exclusion) to 1.0 (for complete inclusion) (RAGIN, 2008). This allows the specification of the score that would qualify a case for full participation in the sharing economy business set, as well as in the set of each condition and the score that would completely exclude it from each set.

Therefore, the calibration process requires the definition of three levels for total inclusion (≥ 0.95), total exclusion (≤ 0.05) and crossing point (0.5), which act as anchors for the establishment of scores deviation. This procedure also allows establishing an area of irrelevant variation, which is central to theoretical analysis.

In the present study, calibration seeks to create scores of fuzzy-type sets that represent a strong degree of belonging to the causal conditions and the result. Therefore, when calibrating the causal and outcome conditions (scales 0 to 100), 75 was defined as a threshold for full inclusion (full membership), 25 for total exclusion

(full non membership) and 50 as a crossover point. The selection of thresholds is based on the assumption that the variance below 25 and above 75 points is irrelevant, since the cases with scores below and above that score already show strong adherence. Diffuse adherence in each conceptual category is established when the case score exceeds the crossing point (Ragin, 2008).

The calibration procedure allows the development of a truth table, which lists all the different logically possible combinations of causal conditions, together with the cases in accordance with each combination. In order to reduce the truth table in simplified combinations, it is necessary to specify the minimum number of cases to be considered in the analysis (frequency threshold) and the minimum acceptable level to which a combination of causal conditions is reliably associated with each result (consistency threshold). A frequency threshold of 1 and a consistency threshold of at least 0.8 are recommended when the objective is to build theory from a relatively small sample, but these should not be applied mechanically (CRILLY, 2011). Taking into account these guidelines, we chose to follow Schneider and Wagemann (2012) and the levels that correspond to a gap observed in the distribution of consistency scores were selected.

The data obtained in the calibration are grouped in a truth table. Truth tables essentially represent empirical data from a study in a tabular format. All possible logical combinations of conditions, or configurations that result in a result (outcome) are presented in the truth tables. However, the truth tables of a Fuzzy-set Qualitative Comparative Analysis study only contain observed empirical data due to the fact that infinite configurational combinations are possible. Thus, if a combination is not empirically observed, it can be deleted or designated as "unimportant" (don't care).

Once the possible combinations of conditions are identified, it is possible to identify the configuration with an empirical presence within the study, which in the fs/QCA method is called a solution. From 64 possible configurations, 57 logically possible configurations do not contain empirical evidence, so one cannot infer sufficiency based merely on the fact that the combination is logically possible. These remainders were partially excluded from the minimization process, since they are still relevant and considered in the counterfactual analysis.

A solution formula is a way of expressing the results (the configuration of conditions that display the result) in an fs/CSF analysis. Letters (representing the variables) connected by Boolean operators represent the results and their respective relevant causal conditions. It is important

to note that such formulas use Boolean operators instead of arithmetic operators. The three main basic Boolean operators used in the description and composition of the solutions are: OU or OR (+) which establishes the union of conditions and is calculated by the highest value between two (or more) conditions; E or AND (*) which establishes the intersection of conditions and is calculated by the lowest value between two (or more) conditions; and NO or NOT (~) which establishes the negation of the condition in question. The \leftarrow symbol indicates the logical relationship.

Thus, when combining the variables with the Boolean operators, the set (or sets) of causal conditions related to the result is obtained. Using the data from the truth table and the Boolean operators presented, the formula for the solution for this study is presented as follows:

$$Y \leftarrow \sim A * B * \sim C * \sim D * \sim E * \sim F + \sim A * B * \sim C * \sim D * \sim E * F + \sim A * B * \sim C * D * \sim E * \sim F + \sim A * B * \sim C * D * \sim E * F + A * B * \sim C * \sim D * \sim E * F + A * B * \sim C * D * \sim E * F + A * B * \sim C * D * E * F$$

Sufficient conditions are determined from measurements of consistency and coverage in the fs/QCA method. Consistency and coverage are measures of the adjustment of possible conditions sufficient to explain a result. Whenever a sufficient condition is present, the result is also present. The condition can also be valid for most cases, but not for all.

In the qualitative comparative analysis, consistency is simply the proportion of cases in which the condition produces the result to the number of cases with the condition. Consistency measures the subset of cases with the condition and the result for all cases with the condition. Coverage is the proportion of cases that contain the condition to the total number of cases in which the result is present. Therefore, coverage assesses the degree to which conditions "respond" to the result. When there are many configurations of conditions for the result, the coverage will be very small for a specific configuration and its importance or relevance will also be small (Ragin, 2008, p. 44).

It is important to note that when all membership scores for the condition are lower than membership for the result, consistency is the unit (1) and the condition is completely sufficient and cases with the result include the cases that display the condition. If only a few cases have a membership condition greater than the membership in the result, the consistency will be close to the unit. Therefore, when using fs/QCA, the analysis conditions considered potentially sufficient for a result generally have consistencies greater than 0.8 (Ragin, 2009).

The fs/QCA method produces condition configurations, represented as solution formulas, related to a result of interest. The formulas of the solutions are then evaluated for their causal link to the result, determining consistency and coverage. Although consistency and coverage may suggest causality, the determination of causality is still based on an interpretation of the FS/CSF settings and results.

Configurations, solution formulas, consistency and coverage constitute the established relationships important for complex causality, just as significance and strength are important in correlational analysis. Consistency, like significance, can support or refute a hypothesis. For example, a configurational hypothesis with low consistency has a weak subset relationship, so the hypothesis is refuted. Coverage, as in correlational strength, indicates the importance of a joint theoretical relationship. Like correlational analysis, where it is possible to have a significant but weak correlation, in analysis based on short-term theory it is possible to have highly consistent configurations with low coverage. Therefore, it is important for researchers, when using conjunctural theoretical analysis, to confirm and support their results with a strong theoretical foundation and substantive knowledge (Ragin, 2008).

In this study, the consistency data for the causal conditions resulted in: RESOURCES = 0.625000; INTERACTION = 1,000; GOVERNANCE = 0.1225000; MISSION = 0.541667; FINANCING = 0.122500; AND TECHNOLOGY = 0.887500. It is observed that INTERACTION has the maximum degree of consistency (=1) followed by TECHNOLOGY (=0.88) and RESOURCES (=0.62). As discussed, when using fs/QCA, the analysis conditions considered potentially sufficient for a result generally have consistencies greater than 0.8.

Once the possible combinations of conditions were identified, at this stage of the analysis it was possible to identify the configuration of a business model characteristic of Brazilian companies with an empirical presence within the sharing economy.

Using the consistency coverage of 0.8 and a frequency of 1.0 the fs / QCA method applies a Boolean algorithm based on a counterfactual analysis of causal conditions and

logical minimization to reduce the rows of the truth table for a solution table. With the minimization and production of the truth table, it is possible to obtain three levels of solution (complex, intermediate and parsimonious) depending on the configuration given by the researcher, however for this study it was only possible to obtain a standard analysis where only the solutions of the complex and intermediate types are shown. In this case, both present the same results since the intermediate solution does not intend to change the causal conditions present. The parsimonious solution is not presented due to the high consistency of the causal conditions, which limited the presentation of other possible configurations. Thus, as a result, only one configuration was obtained represented by the complex solution below in figure 01:

Causal conditions	Solution
	Complex solution
Underutilized resources (RESOURCES)	●
Peer-to-peer interactions (INTERACTION)	●
Collaborative governance (GOVERNANCE)	⊗
Mission Oriented (MISSION)	—
Alternative financing (FINANCING)	⊗
Confidence in technology (TECHNOLOGY)	●
Consistency	1
Raw coverage	0.529167
Unique coverage	0.529167
Solution coverage	0.529167
Solution consistency	1

Condições causais	Solução <i>Complex solution</i>
Recursos subutilizados (RECURSOS)	●
Interação peer-to-peer (INTERAÇÃO)	●
Governança colaborativa (GOVERNANÇA)	⊗
Missão Orientada (MISSÃO)	—
Financiamento alternativo (FINANCIAMENTO)	⊗
Dependência da tecnologia (TECNOLOGIA)	●
Consistency	1
Raw coverage	0.529167
Unique coverage	0.529167
Solution coverage	0.529167
Solution consistency	1

Fig.1: fs/QCA single solution

In fig. 01, black circles indicate the presence of the condition, while crossed white circles are used to indicate the absence of the condition, both according to their respective Boolean operators. The causal condition where no circle is presented indicates that the condition is irrelevant to explain the result of interest. In this case, it can be observed that the causal condition MISSION does not appear to be relevant for the configuration of business models and this condition is explained by the consistency of 0.54, a result of the algorithm that considers the consistency threshold (0.8 and frequency (frequency) of 1 that have been set.

A solution table can also distinguish between central and peripheral conditions, which is based on how the causal components are causally connected to the outcome. In any solution term, there are decisive causal ingredients that distinguish the settings, and complementary ingredients that only make sense as contributing factors (Grandori and Furnari, 2008).

Among the 7 possible combinations (presence and absence of the six causal conditions, for example), according to the truth table produced in this study, only the presence of technology, peer-to-peer interaction, underutilized resources and the absence of collaborative governance and financing are causal mechanisms that exhibit a strong causal relationship with the outcome. Despite the strong causal relationships between the

mentioned conditions and the result, none of them is, in itself, necessary or sufficient for the characterization of a sharing economy business. As expected, the highest score for consistency is INTERACTION with 1.0 followed by TECHNOLOGY with 0.8875 and RESOURCES with 0.6250.

The business model traced in this study, according to the configurational solution presented, combines the presence of three central conditions, which are INTERACTION, RESOURCES and TECHNOLOGY, with two peripheral conditions absent, GOVERNANCE and FINANCING. MISSION appears in this configuration with an irrelevant condition, not even appearing in intermediate and parsimonious solutions.

This configuration portrays a business structure based on three pillars whose characteristics can be observed empirically in all cases studied. It is a business model supported by peer-to-peer interaction, which may be this interaction between people only or people with companies. Peer interaction was the cause condition with the highest degree of consistency (equal to 1), which means that all the cases studied are strongly based on peer interaction to conduct their business.

The use of underutilized resources is also a characteristic observed and portrays a business model based on collaborative consumption. This combination of conditions suggests that the collaborative consumption business models satisfy the most critical conditions to be considered part of the sharing economy, as defined by Chase (2015). The addition of the mission as a peripheral condition is intriguing, since it supports existing research that has sought to incorporate social and ecological impact in the framework of sharing economy business models (for example, Borchert and Geisendorf, 2016; Cohen and Muñoz, 2016; Klutt et al., 2015).

Finally, another causal condition that characterizes the model is technology. Sharing economy businesses based on technology are more like traditional technology startups, as they are highly technology dependent, with the only unique aspect that technology startups facilitate a high level of peer-to-peer interaction. These business models have a significant growth opportunity, which explains the high propensity to have traditional investment in venture capital. In fact, depending on the sector and model, some companies can grow even faster than startups based on traditional technology, as they depend more on a critical mass of users of the bilateral business model than on increasing production and distribution capacity.

Solution paths are evaluated for consistency and coverage based on set theory. While the former assesses

the degree to which cases that share a given condition or combination of conditions agree to display the result in question, it is estimated by dividing the number of cases that are present in a given condition setting and display the result through the number of cases that are present in the same configuration, but do not exhibit the result (FISS, 2011). It evaluates the degree to which a causal combination considers for stages of a result (RAGIN, 2006).

If several configurations are sufficient for the result, raw and unique coverage provide assessments of their empirical relevance (GRECKHAMER, 2011). These theoretical fit measures are descriptive, not inferential, and were developed as methods of exploring cross-case evidence in a configurational way. Table 01 shows that the relationship between the configuration of the conditions and the result is highly consistent, with a consistency value of 1.0. The coverage of the solution or joint empirical importance of the configurational path found is 0.52, indicating that most of the result is explained by this path and, therefore, the solution as a whole is empirically relevant. A consistency of ≥ 0.8 indicates a strong relationship established between the solution and the outcome (RAGIN, 2006).

Based on all these analyzes and considerations, it was possible to observe in this study that the business model of Brazilian companies introduced in the sharing economy consists of a company, or service facilitator, that acts as an intermediary between the suppliers of a good or service (service provider) and customers looking for these underutilized goods and services.

This triadic business model or framework differs from the traditional B2B2C configuration. In a traditional B2B or B2C environment, there is a sales relationship between the intermediary company and the seller (or the buyer), without the need for a direct interaction or transaction between the seller and the buyer. Partners in the supply chain add value to the product or service, as there is a transfer of the product or service on both dyads.

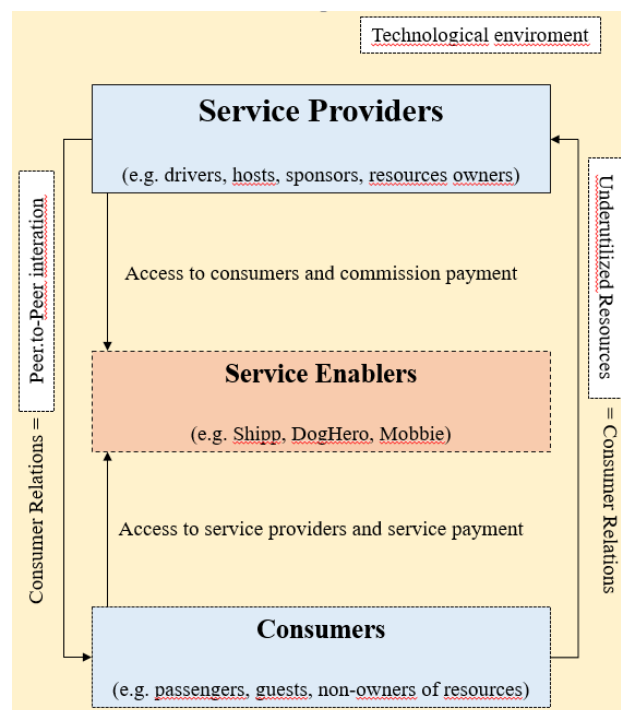


Fig.2: The business model of Brazilian companies in the sharing economy

IV. CONCLUSION

The sharing economy space offers a rich opportunity for researchers to explore a range of interdisciplinary angles. Their activities should not be grouped together in a research project unless attention is paid to the different business models and the differentiated relationships that these models have with entrepreneurs, investors and society.

It is hoped that the identification of the characteristic typology traced in such companies arising from the analysis of selected attributes with a strong bibliographic base, will help to promote the field of sharing economy from a research, practical and political perspective, a subject that is still so new and little explored in the Brazilian scenario.

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