GUILHERME ALCÂNTARA PINTO

ALTERNATIVE LOCAL MOBILITY PLATFORMS ARCHITECTURE:

FUNCTIONS, ENABLERS, AND DESIGN

LAVRAS – MG

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Dissertação apresentada à Universidade Federal de Lavras, como parte das exigências do Programa de Pós-Graduação em Administração, área de concentração Gestão Estratégica, Marketing e Inovação, para a obtenção do título de Mestre.

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ARQUITETURA DE PLATAFORMAS ALTERNATIVAS LOCAIS DE MOBILIDADE: FUNÇÕES, ATIVADORES E DESIGN

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APROVADO em 18 de fevereiro de 2020.

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LAVRAS - MG
2020

To all drivers who are breadwinners of their families.

To all of you that helped me during this journey, specially my co-advisor Kelly, and my friends from the research group: Fábio, Dani and Thaísa – you guys kept me alive

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O único trecho a ser escrito em português; mas, por uma razão singular: a de ser capaz de expressar gratidão a todos, considerando a sensibilidade e o sentimento que cada palavra veicula com maior clareza. Importante reconhecer, contudo, que as mais doces e rebuscadas palavras ainda assim soariam, talvez, como algo rudimentar para um sentimento tão profundo de gratidão a todos que tive a oportunidade de conhecer durante essa jornada.

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“We are all platforms”

“Aaaaaall right!!” (Paul Brandon Gilbert)

RESUMO

Algumas plataformas, em específico as de mobilidade, apresentam como limitação o fato de não operarem em várias pequenas cidades do interior de distintos países. Em função disso, plataformas locais de mobilidade foram criadas, com mecanismos distintos daquelas já bem estabelecidas no mercado como Uber, Lyft e 99. Algumas plataformas locais de mobilidade conseguiram se estabelecer no mercado que por vezes conseguem evitar que Uber e 99 operem nessas cidades. Assim, essa dissertação teve como pergunta de pesquisa o seguinte questionamento: qual é a arquitetura de uma plataforma local de mobilidade e como ela é gerenciada? Para isso, utilizou-se de análise documental, observação não participante e entrevistas semiestruturadas com desenvolvedores, gerentes, e passageiros, todos referentes às plataformas locais de mobilidade, em Minas Gerais. Os resultados mostraram que as plataformas locais de mobilidade conseguem se estabelecer, majoritariamente, devido à dois fatores: (i) gerenciamento dos motoristas e (ii) proximidade com os passageiros. Além disso, foi encontrado uma nova característica de efeito em rede assintótico direcionado aos motoristas, que quando bem gerenciada é capaz de promover defensibilidade estratégica. Como contribuições teóricas esse trabalho oferece uma descrição das plataformas locais de mobilidade sugerindo o conceito de plataformas alternativas, evidenciando elementos que fazem seu modelo de negócio defensável por meio de uma nova categoria de efeito em rede para os motoristas. Como contribuições gerenciais esta dissertação oferece estratégias para fortalecimento de marca, enfatizando a necessidade da participação do motorista para o sucesso da plataforma. O trabalho também provoca uma discussão relacionada às condições de trabalho impostas aos motoristas das plataformas tradicionais e o contexto econômico em que essas plataformas se inserem.

Palavras-chave: Modelo de negócios. Economia compartilhada. Gestão de plataformas. Economia digital. Plataformas alternativas.

ABSTRACT

Some platforms, specifically on the mobility sector, have as a limitation the fact of not operate in some inner cities. Local mobility platforms have been created with different mechanisms from those already operating in large cities such as Uber, Lyft and 99, for example. Also, some of the local mobility platforms are being so effective on their purpose that they are avoiding Uber and 99 to operate in those small towns. Thus, the main goal of this investigation is to find answers to What is the architecture of a local mobility platform, and how does it is managed? Based on the documental analysis, non-participatory observation and semi structured interviews with developers, managers, and passengers, all related to local mobility platforms operating in small cities of the state of Minas Gerais, Brazil we were able to unveil interesting findings. Local mobility platforms are standing their positioning due to two main factors: (i) drivers management; and (ii) proximity with the passenger. It was found a new characteristic of asymptotic network effect related to the drivers, which when well-managed, promotes strategic defensibility. As theoretical contributions, this work presents a description of local mobility platforms, evidencing the elements that make their business model defensible through a new category of network effect for the drivers. As managerial contributions, this master dissertation offers brand building strategies, emphasizing the importance of the driver to the success of the platform. This work also provokes a discussion related to the work conditions imposed on drivers from traditional platforms and the economic context in which these platforms are inserted.

Keywords: Business model. Sharing economy. Platform management. Digital economy. Alternative platforms.

SUMMARY

1 INTRODUCTION

This dissertation seeks to understand the architectural elements of mobility platforms. Specifically, it is intended to understand the underlying mechanism of local mobility platforms. In this section, first, it is established the context in which this research is intended to be conducted and the motivations to develop this study. Next, the research question, objectives, and justifications to conduct this research are presented.

1.1 Research contextualization and motivation

Nowadays, we have witnessed the rise of business that changed whole markets such as travel, entertainment, communication, commerce, education, food and, culture, to name a few. These businesses present a common characteristic: the utilization of the internet. Notwithstanding, a pattern was identified in these businesses; they characterize them as platform business models. In a nutshell, they connect producers and consumers utilizing data, enabling interactions among them to make transactions (CHOUDARY, 2015; GAWER; EVANS, 2016).

The advances that unleashed the platform potential made it possible to create, deliver, and capture value in many ways due to the different mechanisms utilized within an organization. These strategic mechanisms impacted positively in our routines, turning the platforms an answer to many issues that we face daily: Needing a place to stay during business travel? There is a platform for it! Do you need to leave a message to your friends? There is a platform for it! Do you need to find a date? There is also a platform for it! Do you need to go to another place? There is Uber/Lyft/99/BlaBlaCar and other mobility platforms for that!

Furthermore, the presence of these businesses is relevant enough to attribute to the current business period as “The Age of Platforms” (GAWER; EVANS, 2016, p. 4), or to state that “platforms are eating the world” (PARKER; VAN ALSTYNE; CHOUDARY, 2016, p. 36). Also, the “unicorn companies are not as rare as they once were, and perhaps should be called instead of the new ‘workhorses’” (REILLIER; REILLIER, 2017, p. 15).

More than solve our problems in a few commands, platforms brought more value to everyone; For instance, instead of taxi drivers, everyone can now become a driver and make money. Besides, these drivers, in order to compete against taxis, strive to provide more value by offering not only water but, the main attraction for many users: lower price, polite drivers, and clean cars (CORBY, 2017).

However, what if you are in an inner city and need to go to another place? Unfortunately, there is not always a global platform such as Uber, Lyft, 99, and, BlaBlaCar, for that. Still, there are platforms inspired by the businesses above, made locally – hereinafter referred to as local platforms; Although the market gap is similar, asking for an analogous value proposition, these companies present, sometimes, an informal structure and yet, they thrive through the market.

The reasons why these local platforms emerged in the market are multifold. Some have risen because global platforms such as Uber were banned from the local market – the case of Ride Austin, which is nonprofit ridesharing built by the city of Austin, US (RIDE AUSTIN, 2019). Others have risen due to the nonoperation of global platforms in rural areas – the case of Liberty Mobility Now in Ohio, Texas and, Nebraska, which also had a call center to hail a car to those who did not have a smart device (SHRIKANT, 2019). Also, there are platforms that are founded in order to compete against others; this is the case of Arcade City (JIMENEZ, 2018) which offers a unique payment method, which anything can become a payment due to its bartering mechanism, including its own token ARC.

Hence, we argue that toward a similar purpose, there are different mechanisms inside the global and the local mobility platform to supply this market gap. These may also vary according to the scale and the context in which they are immersed. Thus, in Brazil, this reality is not different; other platforms in inner cities are built to supply this demand using different mechanisms: Way, InDriver, Mais Perto, Sampa, Brazil Go, to name a few. The phenomena gained such proportion that even football clubs launched their own mobility app; this is the case of Cruzeiro Go! (MÁQUINA DO ESPORTE, 2019).

In addition, some of these local platforms are being so effective on their purpose that they are avoiding Uber/99/Lyft and platforms already established in the market to enter in inner cities. Thus, there might be a space to capture and give more value to the customers which the last platforms are not paying attention to. Thus, what features do these local platforms present that allows them to compete in a market that at first glimpse might not have room for better service? Are local platforms a threat to global platforms? Is it still possible for global platforms to enter this market?

1.2 Research question, objectives and justifications

Therefore, seeking to analyze these different mechanisms, we seek to answer the following research question: **What is the architecture of a local mobility platform, and how does it is managed?** Hence, the general objective of this dissertation is **to identify the architecture of a local mobility platform and describe the management of those platforms**. As specific objectives:

a) Elaborate a framework to analyze the architecture of local mobility platforms;
b) Map local mobility platforms in the state of Minas Gerais, Brazil;
c) Characterize the local mobility platforms with respect to the managerial elements that make their business model defensible.

By developing these objectives, we aim to supply distinct gaps. First, a two-steps research made in April 8 of 2019, in Web of Science and Scopus database, with the terms in Table 1 (see Table 1), searching in the title, abstract, or keywords, returned that no previous research has been executed analyzing local platforms. It is noteworthy to highlight that the existent literature that explore the characteristics, functions, enablers and design strategies were done basing on global platforms, and thus, this study will unveil the aspects of local platforms.

In addition, surprisingly, the papers returned are not correlated to this study focus. Their conception of platform does not correspond to the business administration field. In a second moment, when inserting the mobility terms, the research scope became considerably narrowed, returning no results.

Table 1 – Research gap regarding local mobility platforms

Terms	**Synonym and variations**	**Research string**
Local	Local; regional; national; small*; small_scale; alternative*; substitute*; secondary; emerging_markets;	Local OR regional OR national; small* OR small_scale OR alternative* OR substitute* OR secondary OR emerging_markets
Platform	Platform*; digital_platform*; two_sided_platform*; Multi_sided_platform*;	Platform* OR digital_platform* OR two_sided_platform* OR Multi_sided_platform*
Mobility	Mobili*; transport*;	Mobili* OR transport*
Final Research string	(Local OR regional OR national; small* OR small_scale OR alternative* OR substitute* OR secondary OR emerging_markets) AND (Platform* OR digital_platform* OR two_sided_platform* OR Multi_sided_platform*) AND (Mobili* OR transport*)	

Source: Prepared by the author

In addition, the dissemination of business models based on sharing platforms is one of the fastest internationalization movements to date (PARENTE; GELEILATE; RONG, 2018). “While industries are being overturned by these firms, the implications of this phenomenon need to be uncovered” (PARENTE; GELEILATE; RONG, 2018, p. 59). In this sense, exploring how this business model is being structured in the market can bring an interesting theoretical contribution to this field of research.

As methodological contributions, this dissertation will present a solid framework to analyze mobility platforms, specifically, the local mobility platforms. Besides, the application of this study may transcend this narrowed perspective, raising the possibility of the replication of this study to a broader context, beyond the mobility sector.

Furthermore, to understand the mechanism underlying these platforms may provide valuable insights concerning to public policies fostering the development of local platforms that could help improve the mobility in cities and also develop the local economy. An example of this can be seen in the Ride Austin app, as previous mentioned.

Finally, to develop this research seeking to understand the underlying mechanisms of local mobility platforms will also present a managerial implication by explaining the architectural features that allow this platform to compete with well-established mobility platforms. Thus, for both platforms, the contributions might be of considerable value. For the local platforms, a compiled with best practices that might unleash the potential of those companies. On the other hand, for the well-established platforms, we unveil a value gap that might unhamper the entrance in small cities.

1.3 Project structure

This dissertation follows the structure of chapters, provided on the “Manual of standards and structure of academic works” from the Federal University of Lavras1. After this introduction, the theoretical background is presented, explaining the main concepts that outline this project, being: Business Models, Architecture of Platform Business Models and its Strategic functions, Digital Economy Strategy, and Mobility Platforms.

Following, in the Methodology section, we describe the research procedures carried out. Next, this dissertation presents the results obtained and final considerations of this research. Then we present the references used in this dissertation. Finally, as will be further detailed, an interview script is presented.

1 Available at: < http://repositorio.ufla.br/jspui/bitstream/1/11017/5/NOVA%20VERSÃO%20DO%20MANUAL%20DE%20NORMALIZAÇÃO%20E%20ESTRUTURA%20DE%20TRABALHOS%20ACADÊMICOS.pdf> Accessed on May 28th 2019.

2 THEORETICAL BACKGROUND

In this topic, we seek to present the theoretical lens used to analyze the local mobility platforms. First, we intend to answer what are Business Models? We aim to provide the foundation to introduce the platform business model pattern. Next, we offer a deeper understanding of platform business models, explaining its architecture and the functions that a platform may present. Following, we analyze key aspects of the digital economy strategy, proposing a way to understand the scenario in which the platforms may be immersed. Finally, we rely on the SAE (Society of Automotive Engineers) definitions to establish a common language in this study.

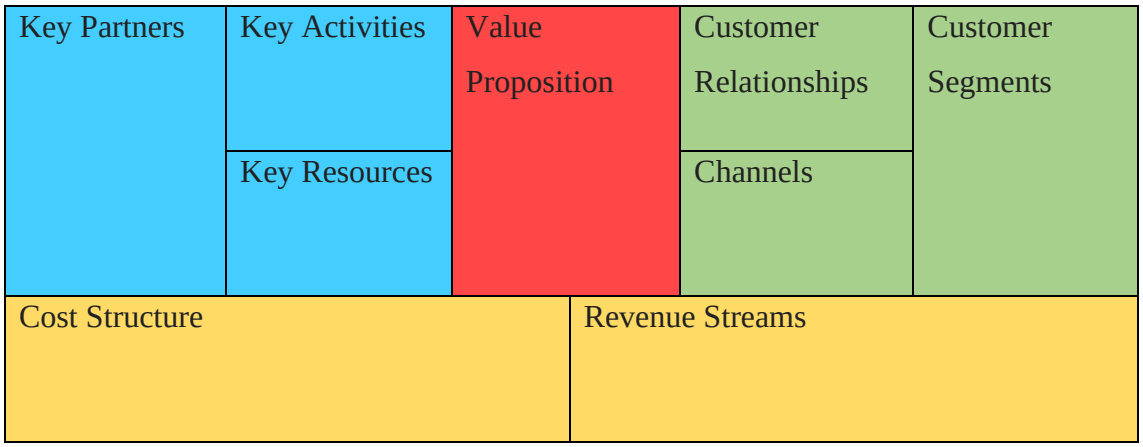
2.1 Business models

In how many ways can we go from point A to point B? Since business is formed and managed to fulfill customer necessity, different necessities lead to different ways to fulfill them. But what is the difference between (i) buy a car and drive from point A to point B; (ii) take a bus and go from a place to another; (iii) call a taxi; (iv) request a ride in an application (ride-hailing); or even (v) request a carpool service in an application (ride-sharing)? All of these options attend to the same necessity, move from A to B, but in different modes. In the examples given, the difference between the offerings is the Business Model that they operate; they offer different values, to different customers, using different resources with different ways to monetize their business. In a nutshell, a business model is defined as:

> A business model is a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams (Osterwalder, 2004 p. 15).

In this sense, the organizational logic is composed of elements that delineate the business itself. For instance, to fulfill a customer necessity, some value must be offered to that customer at a certain price; some of them might be served, while others not. Besides that, the way the organizations will opt to make contact with the customer and how they will manage these relations also varies according to the necessity to be answered. The need to ease the communication of this logic, ensuring the business partners' understanding, Osterwalder & Pigneur (2010) created the Business Model Canvas (BMC), which is shown in Figure 1.

Figure 1 – Business Model Canvas



Source: (OSTERWALDER; PIGNEUR, 2010)

Therefore the BMC, in general, explains "how an organization creates, delivers, and capture value" (Osterwalder & Pigneur, 2010, p.14). For instance, each way to fulfill a mobility necessity presents its business model, with different ways to create, delivery, and capture value. Hence, each field (or building block) in Figure 1 will present different elements that characterize a particular business. The color grouping indicates the central area of the business: (i) product/service to be delivered (in red); (ii) customer links (in green); (iii) business' infrastructure (in blue), and (iv) financial structure (in orange). Stratifying this figure, each building block meaning is explained in Table 2.

Table 2 – Business Model Canvas blocks

Building Block	**Description**
Value Proposition	Needs of a specific customer segment that will be satisfied by a value created by the business.
Customer Segments	Group of customers in which the value proposed will be delivered.
Customer Relationships	This means to communicate and establish links with the group of customers that will be utilized to capture the value that must be delivered.
Channels	This means the value proposition will be delivered.
Key Resources	Primary resources that will be required to create deliver and capture value.
Key Activities	A process which the primary resources will be submitted
Key Partnerships	Main stakeholders that support the business existence
Cost Structure	Main costs that the activity of creating, deliver and capture value begets.
Revenue Streams	Manner to earn money by creating, delivering, and capturing value.

Source (OSTERWALDER; PIGNEUR, 2010)

The possibility to create, deliver, and capture value in many ways is due to the different mechanisms utilized within an organization. These represent strategic options

that module the value delivered to specific customer segments. For instance, move from A to B through a ride-hailing or ridesharing offer different value, and perhaps, aiming at different customer segments.

Furthermore, although different mechanisms can be combined in a way that the whole business logic changes, Osterwalder & Pigneur (2010) identified patterns among the strategic alternatives, in general, the authors propose five patterns. They are shown in Table 3.

Table 3 – Business Model Patterns identified by Osterwalder & Pigneur (2010)

Business Model Pattern	**Description**
Unbundling	There are three different focuses inside of an organization, according to this pattern: (i) customer relationship: Finding customers building relationships with them; (ii) innovation: Developing new products/services offering a better value proposition to the customer; (iii) infrastructure: Improving operational excellence reducing costs and improving quality. These focuses compete for resources within the business. A possible solution is to choose one of them and to outsource the others allowing the company to focus on its core competence.
Long tail	This pattern works on the premise that there are, generically, two kinds of products: (i) hit products: few amounts of products which are frequently sold; (ii) long tail products (or non-hit items): a large number of products which are not sold frequently. Both kinds of products present the same revenue, considering that the latter has a low inventory cost (especially for e-products, such as e-books, e.g.). Therefore, this pattern argues that to offer a "wide scope of 'non-hit' items" (p.75), focusing on many niche segments, using the internet as a customer relationship and/or transaction channel.
Multi-sided platforms	Two or more interdependent groups of customers by interacting between them are capable of generating value. The value proposition of this business model is to facilitate interactions between different groups. The more users, the more value it offers. This business model will be further explained in topic 2.2.
Free as a business model	In this type of business model, the non-paying customers will be "financed by another part of the business model or by another customer segment" (p.89), and at least one customer segment comprises the proof which allows having a broad base of free users. This pattern is also known as "freemium."
Open business model	Business models that collaborate with outside partners. It can happen in two manners: (i) outside-in: when an organization exploits external ideas/resources inside; (ii) inside-out: when an organization provides to external groups ideas/resources. It refers to opening the company's research process to outside parties, integrating outside knowledge into their innovation process – it requires resources that connect the organization with external groups.

Source (OSTERWALDER; PIGNEUR, 2010)

Despite the several existent mechanisms to shape the business model, nowadays, with technological advances, especially the communication and information (ZOTT; AMIT; MASSA, 2011), new patterns of business models were identified (COUFANO, [S.d.]; GASSMANN; FRANKENBERGER; CSIK, 2013)

Using these technological advances, especially the internet, the businesses made upon the platform pattern represent a considerable portion of the recent big companies in the world (GAWER, 2009; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017). The relevance of these businesses is relevant at least the enough to attribute to the current business period as “The Age of Platforms” (GAWER; EVANS, 2016, p. 4), or to state that “platforms are eating the world” (PARKER; VAN ALSTYNE; CHOUDARY, 2016, p. 36).

Notwithstanding, what are the platform business model? How do they operate? What are the main functions and its architecture? What are the phases which the platform passes through? These questions and more will be explained in the following section.

2.2 Architecture of Platform Business Model

The essence of Platform Business Models is to create "significant value through the acquisition, matching and connection of two or more customer groups to enable them to transact" (Reillier & Reillier, 2017, p.22). Usually, the literature also uses "two-sided platforms" and "Multi-sided platforms" (MSPs) to refer to these businesses. Although users' role can is to consume and/or to produce, these terminologies delineate the amount of group of users that the platform encompasses. Therefore, whereas two-sided platforms refers to two types of customers (ARMSTRONG, 2006; EISENMANN, T.; PARKER; VAN ALSTYNE, 2006) (e.g., drivers and passengers in the Uber platform), MSPs refers to three or more types of customers (e.g. content producers, viewers and advertise companies, in YouTube platform) (BOUDREAU; HAGIU, 2009; EVANS; SCHMALENSEE, 2016; HAGIU, 2015). Henceforth, the present study will refer to both terminologies as "platforms," employing the proper term when the number of groups of users is under consideration.

Parker et al. (2016) explain that, in a nutshell, three key components play a role in a platform: (i) the participants; (ii) the value unit and (iii) the filter. Each of them will be discussed in the following paragraphs.

First, concerning the participants, Parker et al. (2016) state that there are: (a) the producers and the consumers, being the producer able to become a consumer vice-versa. In tandem, Reillier & Reillier (2017) also consider a participant the (b) platform owner, though not being a platform side (a group of a customer).

The same authors, toward an ecosystemic approach, also consider as participants the (c) platform partners and (d) other stakeholders. In this sense, (GAWER; EVANS, 2016) state that in order "to create and sustain vibrant ecosystems" (p.7), the platform must also find the right mix of value proposition to these participants within the platform's domain – this balance and its influence on platform performance, will be further explained. Therefore, the former are players who provide complementary products/services to the platform. As for the latter, "actors who have specific interest in the development of platforms, and their impact on public welfare, competition, etc. examples include governments and regulators" (Reillier & Reillier, 2017, p. 79).

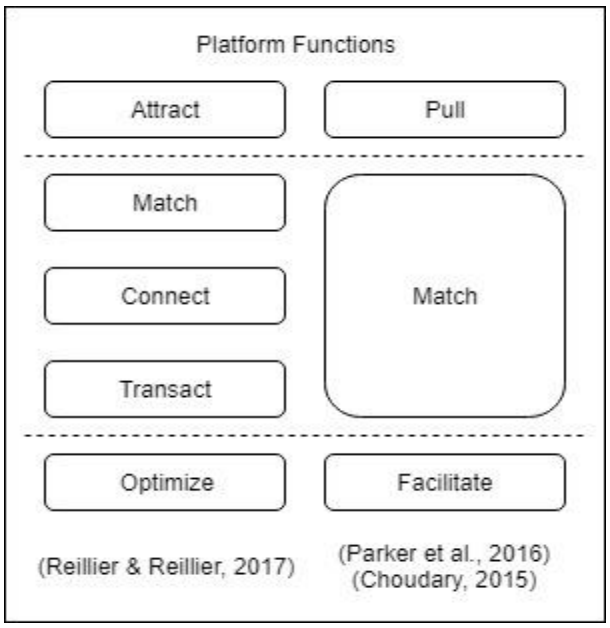
The value unit is considered as the information/goods that create value for both participants. Finally, the filter is the underlying platform mechanism that ensures that the platform's users will receive relevant value units (PARKER; VAN ALSTYNE;

CHOUDARY, 2016). The core interaction, the most critical activity of the platform, is then, a result of a combination of these components.

In general, platforms utilize internet technology as a medium to exchange value between producers and consumers. Hence, the components above work by exchanging information, in order to exchange goods or services, through an exchange of currency between the producers and consumers. In some businesses, the goods or services are exchanged outside of the platform; however, the platform must also track information regarding the value delivery – inside the platform. Information, then, is what makes the platform work (IBIDEM).

Therefore, in order to enable these transactions, platforms must execute some essential activities. Figure 2 summarizes their functions.

Figure 2 – Platform Functions



Source: Prepared by the author

First, platforms must attract the participants to the platform. It involves the identification of participants and the value proposition to each of them (REILLIER; REILLIER, 2017). Other authors also define this as the pull function (CHOUDARY, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016).

Next, the platform must match the participants attracted. In this function, the aforementioned authors present a divergence. While (REILLIER; REILLIER, 2017) state that to match the participants means to introduce them to each other, Choudary (2015) and Parker et al. (2016) argue that to match is to connect and transact value between them.

In this study, (REILLIER; REILLIER, 2017) definition will be used since it presents a more detailed description of platforms functioning.

To connect means that the participants more than being introduced, are connected exchanging information, which leads to a transaction: the value exchange (REILLIER; REILLIER, 2017). In the sequence, to optimize, according to these authors, is equivalent to facilitate the interactions (CHOUDARY, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016). In other words, it consists in using the data involved to elaborate mechanisms that would increase the chances of further value exchange, giving proper tools to the participants and reducing barriers to the platform's usage (CHOUDARY, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017).

Reillier & Reillier (2017) explain that every platform passes through four stages: (i) pre-launch; (ii) ignition; (iii) scale-up; (iv) maturity. Still, according to these authors, while the platform experiences those stages, the abovementioned platform's functions vary – these will be explained in further paragraphs.

Before moving on to the platform phases, it is equally important to explain first that, in tandem with the function flexibilization through the platform phases, some key enablers follows each stage within six elements, even though in some points one might have more importance than others: (i) Trust: a set of principles, rules, filters, process that makes people believe that the platform is reliable, credible and honest; (ii) Governance: norms and policies that guide stakeholders toward an ecosystem; (iii) Brand: the visual identity and its underlying meaning of users' recognition, which works together with trust; (iv) IT (Information Technology) infrastructure: encompasses the broad IT capabilities, such as databases, servers, API (Application Programming Interface), etc.; (v) UX (User Experience): the user's journey, and touchpoints with the platform and participants; and finally (vi) Payment: the payment architecture and its friction experience. An overall of the platform stages, its functions and enablers are shown in Table 4.

Table 4 – Platform's functions across its lifecycle phase

	Phase			
Functions	*Pre-launch*	*Ignition*	*Scale-up*	*Maturity*
Attract	Define key participants, the value proposition for each one of them, tools and services to be provided to users	Solve the chicken-and-egg dilemma deciding which side to promote first and to build liquidity	Manage feedback loops and network effects to attract more users and then to keep already-users interest to strengthen liquidity.	Retain users obtaining insights from UX
Match	Define filter criteria to match	Define the key criteria to best match	Improve matching finding missing supply points through data and automate to scale	Improve filters to strengthen the effectiveness
Connect	Define the type and nature of interactions	Understand participant's interactions and define rules to optimize	Facilitate positive interactions and preventing negative ones	Rely on a mass scale to increase the quality and quantity of relevant content
Transact	Define the type and nature of transactions	Evaluate whether previous activities are leading to value unit transaction and improve liquidity	Promote frictionless transactions; introduce monetization mechanisms	Revise pricing structures
Optimize	Define what data will be necessary to optimize as well as a strategy to obtain this data	Ensure that (i) metrics are identifying bottlenecks; (ii) users' feedbacks are considered; (iii) key data is being tracked	Development of metrics to monitor growth trajectory finding a way to maximize positive network effects	Identify key financial metrics to sustainable growth
Enablers				
Trust	How to establish trust?	Map key trust interactions	Deploy solid trust and safety mechanisms	Consolidate trust
Governance	What are the norms and policies for value creation to all stakeholders in the platform? Who can join the platform?	Adjust norms and rules according to user behavior	Adjust principles to mass scale; automate conflict resolutions and provide community management tools	Consolidate governance synthetizing norms, rules, policies and empower customer service
Brand	What does the brand stand for, and how does this is translated by the visual identity?	Ensure brand identity is aligned with platform fit	Consolidate brand to appeal to the mass market audience	Consolidate brand to appeal to new and existent users
Infrastructure	To build or to buy the platform infrastructure	Ensure that infrastructure support platform fit	Scale IT infrastructure	Maintain infrastructure
UX	Define which features platform will control	Remove bottlenecks optimizing UX	Optimize UX to reduce friction	Simplify, capture insights to explore complements
Payments	Define frictionless payment routines	Test payment routines (if needed) and align with trust principles	Scale payment solution (if needed)	Investigate other revenue streams

Source: Adapted from (PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017)

As seen in Table 4, the pre-launch stage deals with the platform architecture design. Therefore, the same authors suggest some key questions in which their answer defines the platform's functions, and hence, its architecture that must be developed (see Table 5).

Table 5 – Platform Design Elements

Design elements	**Key decisions to be taken**
Market focus	Which part of the market does the platform intend to aim first? Should you target a well-defined vertical first and then expand to other ones, and if so, which ones?
Type of interactions	Will interactions between participants be one-to-one (e.g. Uber), one-to-many (e.g. AirBnB) or many-to-many (e.g. Facebook)?
Nature of interactions	Will interactions be transactional (e.g. eBay) or relationship-based (e.g. Facebook)? Will connections are asymmetric (a participant follows another one such as Twitter) or bidirectional (opt-in from both sides as Uber or Facebook)?
Level of intermediation	Will the platform participants connect directly (e.g., Uber: driver and passenger), or indirectly (e.g., Mastercard through banks)?
Nature of transaction	Will the exchange of value involve physical goods (e.g., eBay), virtual goods (e.g., Instagram), standardized services (e.g., Airbnb, Uber), or data (e.g., Waze)?
Platform currency	What is the platform's currency? Cash (for physical goods, standardized goods, e.g.), reputation, attention, influence (for virtual goods, e.g.), or the platform have no currency?
Payment structure	Who will the platform charge? The producers, the consumers, or both? How will charging be made? Charging a transaction fee (a percentage of the transaction price between the users as Uber does); charging for access (charge producers to access a community as Google Ads does); charging for enhancing access (providing more value to users who paid for enhanced access as LinkedIn does); charging for enhanced curation (provide high quality content for those who pay, as Coursera does).
Governance	What are the main rules? - Is everyone allowed to join the platform (open) or a curated few (closed)? - Will the platform present centralized or decentralized governance? (e.g., managerial decisions regarding pricing: will the platform delegate to users as eBay does, or will the platform control, as Uber does?) - What user experience features will be controlled by the platform? - What are the interaction rules between consumers and producers?

Source: Prepared by the author based on (CHOUDARY, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017)

Regarding Table 5 it is important to highlight that the architectural elements presented by all the authors cited, provide a deeper level of analysis to the Business Model Canvas (OSTERWALDER; PIGNEUR, 2010). The Business Model Canvas does present the proper elements to represent this business model. However, the objective of categorizing the intrinsic architectural platform elements is to give another dimension to the nuances of the platform business model pattern.

Still concerning the pre-launching stage, in general, the platform managers should focus on (i) identify the key stakeholders and the value proposition that the platform intends to offer to them, (ii) define the number of potential participants, and (iii) prototype the platform. It is important to consider that "their [the platform stakeholders] expected contributions need to be defined and incentivized by the platform, it cannot, by definition2, be entirely controlled, but merely influenced" (Reillier & Reillier, 2017, p. 78).

Considering that this is a design stage, all the enablers are set to shape the platform's architecture. Therefore concerning the governance, it is essential to define the "whos" and "hows" of the platform. Mainly, who can join the platform and how they interact and transact, in other words. The trust foundations rely on these mechanisms (REILLIER; REILLIER, 2017), and besides, its delineation sheds light on the definition of platform growth strategies.

A good governance system uses four kinds of tools: (i) laws: explicit rules to forbid/encourage behaviors, sanctions; (ii) norms: informal codes and behavior formed by the culture and social pressure or publicity. Managers are responsible for creating those stimuli, fostering the desired culture – a behavioral design; (iii) architecture: self-improving software systems that encourage good behaviors; and finally (iv) markets: incentives used to govern behaviors (PARKER; VAN ALSTYNE; CHOUDARY, 2016). In the platforms world, social currency is often more valuable than monetary incentives. These mechanisms well-designed incentive the share and creations of IP (Intellectual Property), reducing the interaction risks in the platform.

In the payment perspective, the decision of whom (producer or consumer) to charge is hard to define according to Parker et al. (2016) because it is not possible to predict one's reaction. However, they provide some advice: (i) to charge all users might discourage participation; (ii) charging only one side while subsidizing another might create a feeling of inequality impairing governance and trust mechanisms; (iii) no charging might encourage participation and attract members, though at some point charging one side is necessary.

Finally, since the initial stages of the platform, to consider whether to buy or make the platform's infrastructure is another key decision that managers must take. With this respect, managers must consider off-the-shelf solutions (REILLIER; REILLIER, 2017).

[2] Author's emphasis

In this case, the white label business model could be considered. In this pattern "a white label producer allows other companies to distribute goods under their brands, so it appears as if they are made by them" (Gassmann et al., 2013, p.12). In a platform environment, the white label would appear as a "platform to build another platform."

The next phase, Ignition, is when the platform is being tested and launched, attracting the first users. Mainly, the platform's activities are set to pass the product/market fit, or as (REILLIER; REILLIER, 2017) state: the "platform fit." According to these authors, first, it comprises the platform launching techniques aiming to solve the chicken-and-egg problem.

The issue is that platforms are made to connect producers to consumers and vice-versa. However, during the platform launching, neither producers nor consumers are on the platform. Thus, the problem is how to attract consumers (or producers) if there are not producers (or consumers)? One side will not participate without the other. Table 6 presents strategies commonly used to overcome the chicken-and-egg dilemma (CHOUDARY, 2015; HAGIU, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017).

Table 6 – Strategies to solve the chicken-and-egg dilemma

Strategy Category	**Description**
Focus on one side first	Also called as single-sided market or staging strategy, this category focuses on once the value proposition that makes sense for one side is developed, pivot creating a platform by opening to the other side. Also, some strategies that demonstrate the business success to attract one side, and then, opening to another side also fits in this category. For instance, design tools for only one side of the platform, attract one side, and then, design tools for the other side, attracting them.
Use producers or consumers to attract the other side	To give incentives to users (producers or consumers) in order to bring the other side participants to the platform, such as a crowdfunding platform does. For instance, the "producer evangelism strategy," which consists in to delegate the consumer attraction activities to the producers, who bring their consumers to the platform.
Seed one side to ignite traction	The platform owners act as the producer to create value to a particular set of consumers. To create fake profiles of supply or even to open gradually to a broader number of producers after the platform owner produces a considerable amount of high-quality content (having the opportunity to control content's quality) are examples of this category.
Focusing on meshed communities	To prioritize the platform access to groups of users which often behave as both producers and consumers as entry points until it achieves critical mass, and then, open to users who only behave as a producer or only a consumer.
The bowling pin or micro market strategy	To focus on a key group of users who already know each other and concentrate them on the platform to create a substantial critical mass, though small, and gradually expand to other groups.
The big-bang adoption/launch or event strategy	To use a physically crowded place to demonstrate the platform innovation creating a high volume of interest on the platform such as Twitter and Tinder done to achieve critical mass.

Strategy Category	Description
The marquee or VIP strategy	To attract lead users (or star/key users – users who are social/digital influencers) giving incentives (platform currency, e.g.) in order to attract "non-key" users to the platform.
The piggyback strategy	To stick into another business offering a complementary value unit in order to attract users to the platform.
The cultural meme strategy	To use a cultural element to foster or facilitate engagement with the platform

Source: Prepared by the author based on (BOUDREAU; HAGIU, 2009; CHOUDARY, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017)

Another approach to address the chicken-and-egg dilemma stating that at the beginning, the platform must have a standalone mode, which means that the platform should find a way to deliver value even without both users (CHOUDARY, 2015). Therefore, users may sign up seeking the standalone value. In this sense, when the platform reaches the critical mass, it would increase the amount of value delivered. According to this author, the platform is most likely to surpass this phase presenting this standalone mode. Still, this strategy focuses on one type of user and, then attracts the other side.

In general, concerning the first adhesion of the members into the business platform, the managers should be able to induce a frictionless entry. This type of entry in the business model, allows the users to quickly and easily join a platform participating in the value creation, which is a key factor that enables the platform to proliferate (PARKER; VAN ALSTYNE; CHOUDARY, 2016).

Reillier & Reillier (2017) explain that although these strategies are suggested to attract users, it is important to remember that at the ignition phase, the focus is to find the platform fit, not to scale up (next phase). Therefore, the platform managers must understand how each function is working identifying platform bottlenecks and ways to optimize it creating liquidity. It comprises (i) test the core interaction and filters finding ways to automate it; (ii) evaluate the need for more data and understand user's behavior and their feedback figuring ways to improve trust.

Also, defining the norms and rules for interaction at this phase, as Reillier & Reillier (2017) suggest, must be made carefully according (PARKER; VAN ALSTYNE; CHOUDARY, 2016). The latter argues that although the more rules and norms for interaction increases the platform's reliability, it might increase its friction (consumption barriers), reducing user's participation, and, consequently, hampering the platform's development. The same could happen with monetization decisions such as using a freemium model to launch the platform to test monetization mechanisms, though this

decision is not a priority at this stage according to (REILLIER; REILLIER, 2017). In general, "participants should feel comfortable interacting and transacting on the platform" (p. 101-102).

Finally, despite some users might feel the necessity to bring more tools, features, and members to facilitate interactions, it is important to consider that to address this demand, toward a wider acceptance, more privacy tools, norms, and rules is necessary (GAWER, 2009).

In the following phase, scale-up, the main focus is to build critical mass equalizing the ratio of producers and consumers (though not necessarily in the same amount) which creates network effects (REILLIER; REILLIER, 2017): the mechanism underlying platform business models (GAWER; EVANS, 2016). It consists in to create demand economies of scale considering the installed base as the business' main propeller.

Therefore, efficiencies in social networks make the networks more valuable to all its users (PARKER; VAN ALSTYNE; CHOUDARY, 2016). In other words, platforms have as a central feature of the network effects. Taking Uber as an example: the more users are demanding, more drivers will be necessary; Increasing the number of drivers, the riders get a better value by being attended quicker. Moreover, increasing the number of riders, less driver downtime is obtained. Due to the increased demand, lower prices can be charged – a win-win (drivers and riders) benefit, which "triggers a self-reinforcing cycle of growth" (Gawer & Evans, 2016, p.5).

Although the platform has its positive effects bringing more customers to its installed base, there are also negatives effects. It is the matching issue between the users of the platform. If a match is not possible, value creation for both sides will not be possible. Underlying this issue, there are data-driven subjects, which ask a good design of the business platform, providing, thus a value creation and delivery for both sides – returning to the optimize function in the ignition phase, if necessary (REILLIER; REILLIER, 2017).

Network effects impact users in four ways: (i) same-side effects (also called as one-sided network effects or direct network effects): impact from one user to another being both from the same side of the platform (e.g. consumers into consumers); or (ii) cross-side effects (also known as indirect network effects): impact from one user to another being both from different side of the platform (e.g. consumers into producers). Both effects can be positive or negative, thus, four kinds of impact (EISENMANN, T.;

PARKER; VAN ALSTYNE, 2006; HAGIU, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017).

All of these effects are based according to the balance of the amount of value delivered for each player on each side of the platform. In the same-side positive effects, the more users in the platforms, the more value is generated to the same side of users. In the same-side negative effects, the excess of users leads to less value delivered to the users. The cross-side positive effects mean that the more producers (or consumers), the more value is generated to the consumers (or producers). While, in the cross-side negative effect the more producers (or consumers), less value is generated to the consumers (or producers) (PARKER; VAN ALSTYNE; CHOUDARY, 2016). Therefore, the main challenge in the scale-up phase is "to grow each side to critical mass in a balanced way" (Reillier & Reillier, 2017, p. 105).

Regarding the harmonious balance between producers and consumers, the same authors explain that to find this balance asks to comprehend the optimal ratio of active producers and consumers. Besides, it requires the notion that different product/service categories might have different equilibria in different geographies, leading to different levels of maturity across its coverage. Furthermore, "balance between the two sides is likely to shift over time" (Reillier & Reillier, 2017, p.112).

Notwithstanding these peculiarities, in general, the platform's functions are set to promote a frictionless attraction, optimizing matching and reducing any barriers to transacting (REILLIER; REILLIER, 2017). Thus, first, the authors recommend creating viral growth and then strengthening liquidity.

According to (PARKER; VAN ALSTYNE; CHOUDARY, 2016), the viral growth is the spread of a value unit by the sender (value unit must be spreadable) into an external network.

> Virality is a user-generated scale. In a viral system, the more users come on board, the faster can new users come on board, till a market achieves saturation. As the user base grows, so does the ability to grow it further. As a result, the slope of the growth curve constantly increases while an offering is finding viral adoption (CHOUDARY, 2015).

To go viral (CHOUDARY, 2015) explains that there are in general, two strategies: (i) bump strategies: which consists in "giving a push" to the platform by advertising or showing off in events – considered by this author as marketing strategies; and (ii) to build an engine to grow virally: "as more users use the offering, it gets exposed to new users, leading to greater growth" (p.233).

Furthermore, it is important to clarify the difference between network effects and virality since both "tend to magnify value and scale, respectively, as more users use the platform" (CHOUDARY, 2015). Network effects are inherent to closed networks, whereas virality transcends closed networks going toward different medium to propagate its value proposition. On one hand, network effects mean that the more users using the service, the more value to them is added; while on the other hand, virality means that more users bring other users. Every platform needs network effects, but not all of them will benefit from virality. For instance, e-mail services are interoperable across different e-mail providers. Therefore, a Hotmail user can send an e-mail to a Gmail user. However, a Hotmail user does not need to have other users using Hotmail to see the value in the e-mail service – this is virality, not network effects. Yet, LinkedIn will provide more value to users only if more users are on the LinkedIn platform (CHOUDARY, 2015).

Therefore, according to the same author, the engine to grow virally must comprise: (i) an external network to spread the value unit; (ii) a spreadable value unit that must be aligned with the platform core interaction; (iii) sender incentives: provide value to user propagate the value unit in the external network; (iv) recipient incentives: provide value to the invited user, who will receive the spreadable value in the external network, within the scaling-up platform (CHOUDARY, 2015). For instance, Instagram scaled-up fast using Facebook as an external network to share photos and invite new users. The same occurred to AirBnB spreading its value units on Craigslist (IBIDEM).

Although Reillier & Reillier (2017) state that the focus on the scale-up phase is to bring more users Choudary (2015) recommends creating mechanisms to retain users first. In other words, to retain users means to strengthen liquidity. In this sense, Parker et al. (2016) suggest maintaining feedback loops. It encourages users to keep using the platform by studying users' activity, preferences, interests and needs to enhance value creation. Regarding this, there are two types of feedback loops (i) single-user: which platform learns about its users to improve its mechanisms or (ii) multi-user: which producers learn about their consumers. In general, as Reillier & Reillier (2017) state, "retention efforts at the beginning of the scaling stage tend to focus on product and customer experience improvements, and reviews of user and producer funnels" (p.111).

Still concerning the function of attracting more users, Reillier & Reillier (2017) explain that more than create network effects is important to make their entrance as frictionless as possible. Thus, although understand users' pains and provide quickly are priorities, a common bottleneck in this function is due to the fact that attracts producers

might be more complicated than consumers (CHOUDARY, 2015; REILLIER; REILLIER, 2017). The reason is threefold: (i) some quality filters on the producers' side might be necessary in order to ensure consumers' safety and the platform's reputation. Therefore, the platform must eliminate the process' bottlenecks by new mechanisms if necessary in order to scale-up (REILLIER; REILLIER, 2017); (ii) the producers "may need to familiarize themselves with tools to engage and ultimately transact on the platform" (IBIDEM p. 108). Providing accurate and accessible information and support is vital in those cases; finally (iii) if producers are sellers they may not want other sellers in the platform seeking to avoid competition (CHOUDARY, 2015). Then, the platform should understand these peculiarities and provide the right incentives to them, promoting as much frictionless experience as possible (REILLIER; REILLIER, 2017).

This difficulty in finding producers becomes more evident in the match function since it will be possible to identify missing supply or demand according to different filters of location, times, products category, etc.. Therefore, in order to reduce bottlenecks, platform managers must understand what incentives make these missing users participate and then provide the right offerings. Besides, during this observation, new customer segments might be found, and, therefore, new features could be implemented. Hence, as the platform grows, matching improvement (automation, time, and relevance) becomes crucial (REILLIER; REILLIER, 2017).

Regarding connect, transact, and optimize functions, at this phase, the main point is to elaborate mechanisms that unleash platform growth. Specifically, the payment structure will become an important element to sustain the platform's growth. Thus, the platform managers should consider the suitableness of the current payment structure, and the possibility to subsidize one or more of the platform sides (REILLIER; REILLIER, 2017).

Finally, the enablers at the scale-up should be supportive of expected growth at this phase. Hence the governance mechanisms must be automated, providing the community management tools to solve their conflicts (REILLIER; REILLIER, 2017). Therefore, (PARKER; VAN ALSTYNE; CHOUDARY, 2016), concerning the laws and rules to forbid/encourage behaviors to state that the user's action feedback must be quick to good behaviors and slow to bad behaviors. This is because to delay negative feedbacks to malicious users may not let them discover what behavior triggered that feedback; thus, they will be encouraged to act carefully throughout all of the platform's functions. Still, concerning the governance mechanisms, the decision whether to allow everyone joins the

platform, or not, is a decision that plays a considerable influence on the platform's growth – it should be taken under consideration by the platform managers.

In general, since the other functions in the scale-up phase are set to provide a frictionless experience, the complaints about the platform should decrease. Therefore, regarding the other platform enablers, they might not have many tasks as the previous phases, though it still needs to be supportive of the scaling process (REILLIER; REILLIER, 2017).

As the platform gains scale, competitive threats are likely to emerge. Thus, moving on to the maturity phase, in general, the platform should focus on retaining users enhancing features to consolidate its brand (REILLIER; REILLIER, 2017).

Therefore with respect to the attract function, the platform should keep understanding users' behavior to gain insight into new features (REILLIER; REILLIER, 2017). While, then, retaining users might ask for more features, there are extension developers (developers who are, typically, not employed by the platform) responsible for creating additional functions beyond the platform's core interaction (PARKER; VAN ALSTYNE; CHOUDARY, 2016). The same authors also explain that the platform's openness degree must be carefully controlled due to (i) the possibility to pollute the platform with features not relevant to the users, which may affect the platform reputation and UX negatively; and (ii) the possibility of the extensions deliver more value than the platform itself (REILLIER; REILLIER, 2017) – a topic that will be further detailed.

Hence, understanding users' behavior should encompass the tracking of whether users are actively using an extension to support core interaction within the platform. In this case, the platform might consider either acquire or duplicate this feature into the platform (REILLIER; REILLIER, 2017).

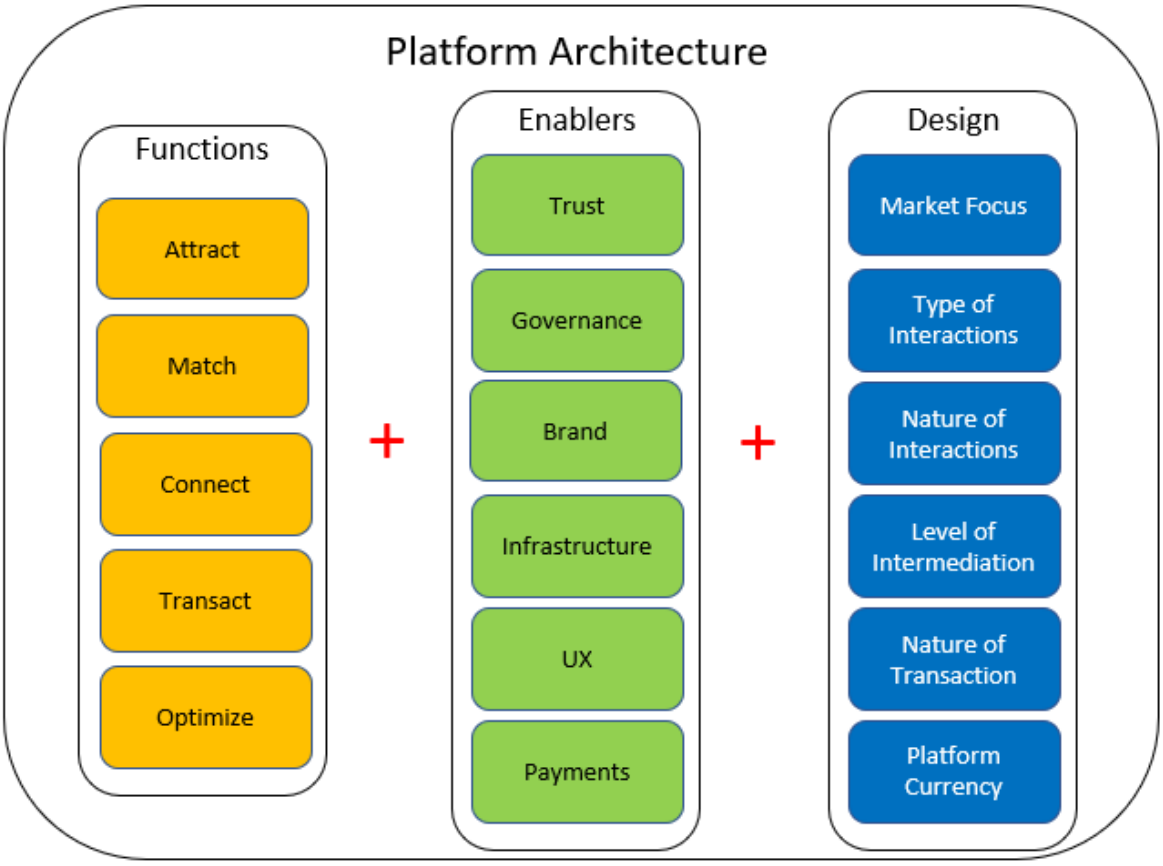
Concerning the other functions, since the platform achieved a critical mass of users, all the changes are related to providing an optimized UX (REILLIER; REILLIER, 2017). Regarding the match function, the platform becomes more likely to present a wide range of results; therefore, filter improvement might be required. The connect function is now able to explore the mass scale unleashing the possibility "to increase quality and quantity of [the] relevant content available on the platform" (p. 125). Next, in the transaction function, considering that many transactions are being conceived on the platform, the pricing structures could be revised in order to capture the excess value delivered, creating refined pricing structures. Finally, regarding optimize, the platform may present a considerable data mass which more than providing managers elemental

data to understand the consumer behavior even better, improving UX, allow them to focus on the key financial metrics that monitor the platform's growth (IBIDEM).

In the maturity phase, (REILLIER; REILLIER, 2017) explains that the enablers are also focused on the UX. However, to manage possible changes may consider that many users are familiar with the platform functioning. In addition, any decisions should take into account (i) their impact on network effects (aiming to reinforce positive ones), including when several decisions are about to be taken; and (ii) the ecosystem it encompasses considering the stakeholders' interests. Besides, regarding trust and safety, the norms, rules, and policies might ask for revising since, during the previous phases, they were reformulated recurrently. Thus, their simplification giving a broad autonomy to the customer service may reduce support costs (IBIDEM).

Thus far, this study has presented that the internet paradigm shift has changed the manner to do business; especially, concerning the emergence of platform business models. Therefore, this section has attempted to provide an investigation of how platform business models work, reviewing the key aspects of its elements, architecture, and functioning across its different phases. Having discussed the platform functioning, turning now to the competition scenario, what is the strategic dynamic of the "digital world" surrounding platforms? What are the possibilities when a platform faces a competition? The section that follows seeks to answer those questions. Figure 3 summarizes the platform architecture explained in this section.

Figure 3 – Platform Architecture



Source: Prepared by the author

2.3 Digital Economy Strategy

In general, the internet advances pushed different mechanisms to capture, create, and deliver value to the customers, if compared to traditional business, or pipelines, as seen on the previous topic. In this sense the change can be described in the manner in which the customers cocreate goods and services; they become “prosumers”: a mix of producers and consumers (RITZER; JURGENSON, 2010; TAPSCOTT; WILLIAMS, 2006). For instance, (FUCHS, 2011) consider that platforms such as Facebook or YouTube works based on the user’s content production, which is consumed by themselves prevailing the content which presents more quality to them – this is the platform’s quality control as (PARKER; VAN ALSTYNE; CHOUDARY, 2016) states a quality control which is co-created by both: the prosumer (consumer decides which content is more relevant, and, then producer learn which will give them more prominence) and the platform (since there are several mechanisms to hamper malicious value exchanges, as seen on Section 2.2). Hence, users tend to adapt to the businesses that own a more installed base of users (more users to consume, produce and, assess content) – an effect called network externalities (SHAPIRO; VARIAN, 1999).

With this respect, it is essential to highlight that some authors treat both terms network externalities and network effects as synonyms (PARKER; VAN ALSTYNE; CHOUDARY, 2016). It is not the aim of this study to define or decide whether those terms are equal or not. However, in this study, the differentiation of both terms will be adopted. In this case, the network effects are, in a nutshell: the more users, the more value is given to them – as seen on the previous topic (CHOUDARY, 2015; GAWER; EVANS, 2016; REILLIER; REILLIER, 2017). As for the network externalities, it regards the positive or negative impacts of network effects (REILLIER; REILLIER, 2017; SHAPIRO; VARIAN, 1999). In another word, it concerns the impact of the statement: more users equals more value. A simple analogy on what a network externality is is found on Reillier & Reillier, (2017), p. 31: “a pleasant scent of a perfume worn by a stranger in the underground can be seen as a positive externality”.

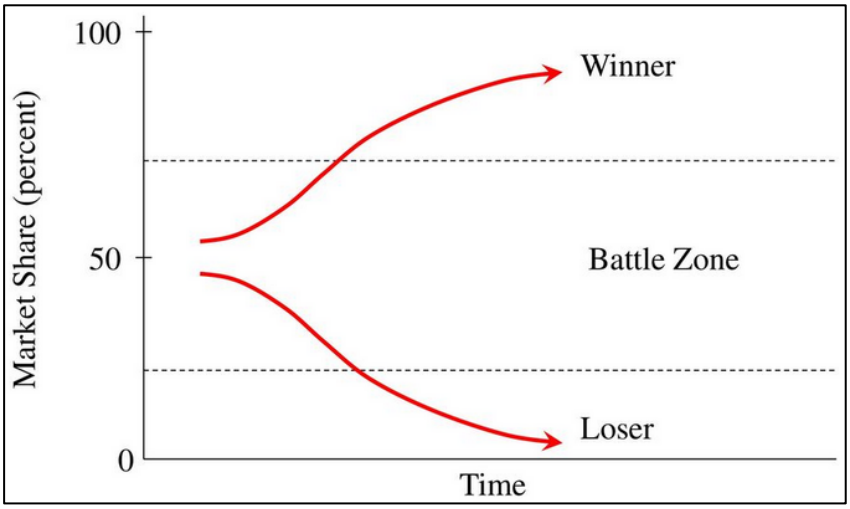
Note that this differentiation of network effects and network externalities asks a clear definition of what is the business value proposition to users. In the example given, if we consider that the ‘the pleasant scent of a perfume worn by a stranger that passes by’ is the value proposition of the perfumery, the network externality will change. In this case, the network externality is the impact of ‘to smell the pleasant scent of a perfume

worn by a stranger that passes by,' which might be, for instance, to remind of childhood memories, or to smile at the stranger that wear that perfume.

Utilizing this example to explain another difficult concept, if we consider that one buys this perfume due to the pleasant scent smelled, this is the virality: users bring more users (CHOUDARY, 2015). These effects play an important role in the digital economy since it might induce users to interact with the platform, influencing production and consumption behavior, and hence, on the network effects.

In consequence of the network externalities, a "winner-take-all" behavior, also known as positive feedback, is inherent to the digital economy: "strong get stronger, and the weak get weaker, leading to extreme outcomes" (Shapiro & Varian, p. 175, 1999), being unlikely the coexistence of two companies on the same market. This competition is shown in Figure 4.

Figure 4 – Positive Feedback



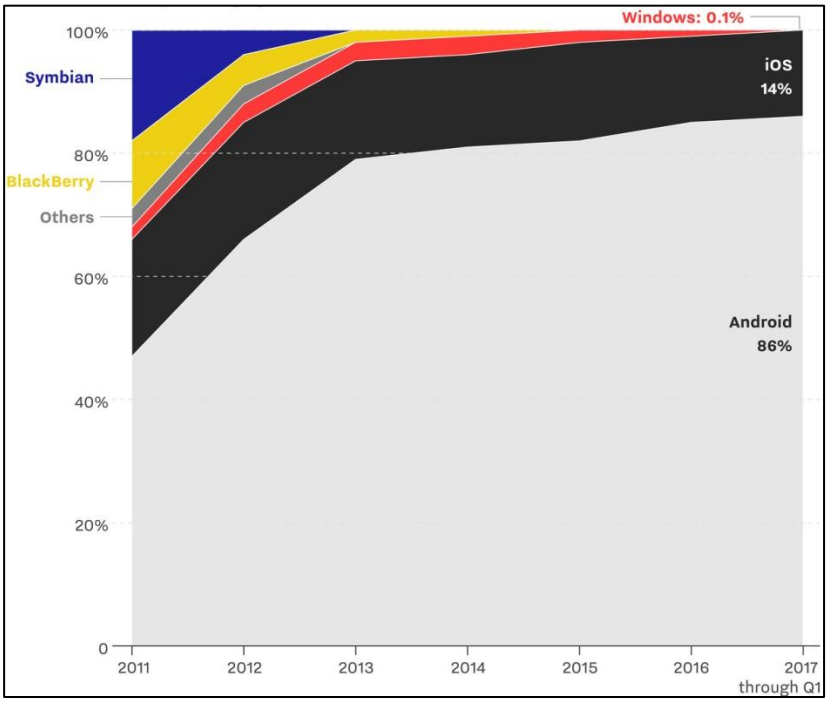
Source: (SHAPIRO; VARIAN, 1999)

It is essential to highlight that within the platform context; positive feedback has a close relation to the management of users' numbers in the platform context. Notably, while companies are at the battle zone, some users might also be users in other platforms that compete among them. In this case, the involved platform faces the multihoming (EISENMANN, T. R.; PARKER; VAN ALSTYNE, 2009; EVANS; SCHMALENSEE, 2016; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017). For instance, in the mobility market, drivers might use more than one platform (Uber and 99, e.g.), to find riders. Furthermore, users might evaluate the cost of multihoming; for instance, a PC user frequently relies on one operating system since the cost to learn and

afford additional hardware/software is expensive (EISENMANN, T.; PARKER; VAN ALSTYNE, 2006).

For instance, consider the battle between the mobile operating systems (see Figure 5). In 2011, there were at least six operating systems. In 2017, there were only two leading mobile operating systems, and nowadays, Microsoft has already announced Windows Phone discontinuity in December 2019 (MICROSOFT, 2019). In this case, Android and iOS are the "winners" of this battle. Although it is not possible to predict who is going to win the "future rounds" of this battle, currently, Android is more likely to win if we analyze through its installed basis.

Figure 5– Mobile Operating Systems Marketshare

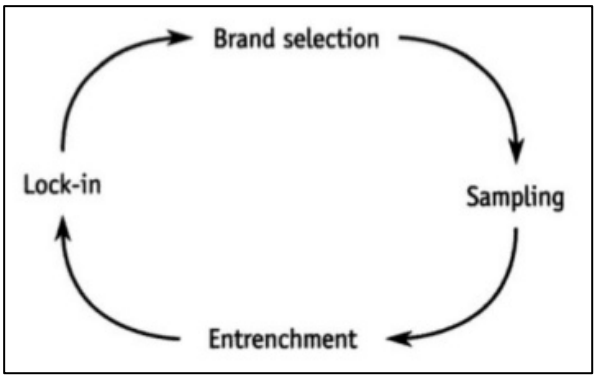


Source: (MOLLA, 2017)

This also has been seen in the case of the battle of Google Allo and WhatsApp or Google Plus and Facebook, which both competitions lead to the shutdown of Google's products. Since this behavior leads to the predominance of one platform over another, the organizations' mechanisms are made to retain the prosumer to that company, increasing the costs to abandon a company – the switching costs (EISENMANN, T.; PARKER; VAN ALSTYNE, 2006). Therefore, the platform attempts to retain users is described in the lock-in cycle (See Figure 6). This competition is better described by the lock-in cycle,

which shows the phase in which a prosumer is submitted while choosing one brand over another.

Figure 6 – The Lock-in Cycle



Source: (SHAPIRO; VARIAN, 1999)

The brand selection comprises the phase in which the customer buys a product or sign up for a service. It is important to consider that the installed base plays a role by influencing the consumers' choice. Besides, concerning the platform architecture, the virality might influence this decision (CHOUDARY, 2015).

Following, in the sampling phase, the consumer uses the brand. For instance, freemium platforms (Spotify or Apple Music, e.g.) attempt to provide a frictionless entrance by changing its payment structure, offering free sampling (30-days-free, e.g.). According to Wheeler (2017), the brand has a symbolic and social identification characteristic from the product recognition process. The author explains that it can be considered a set of individual components, such as a name, design, set of images, slogan, vision, design, style of writing, which differentiates the brand from others. Some human-like characteristics that resonate with potential consumers may be imbued with them. These personality traits can help marketers and entrepreneurs create different brands from rival brands (KHAN et al., 2019). Still, in relation to the brand, it is important to draw attention to the discussions by Shapiro & Varian (1999) who highlight that there is a risk to attract new clients but never turn them into revenue-paying customers, also being difficult to sustain since it is a price effect (PARKER; VAN ALSTYNE; CHOUDARY, 2016).

The entrenchment occurs when the customer gets used to and develops a preference for that brand. In this phase, users buy complementary features to the product/service being loyal to that brand. Next, in the Lock-in phase, due to the

investments made (either time or money, e.g.) or the user's learning upon that service, the costs to change from one brand to another are high enough to keep him/her into with that business (SHAPIRO; VARIAN, 1999).

Examples of the Lock-in effect varies in several industries, especially those companies that operate in the platform business model, ranging from software (Microsoft's Office products) to entertainment (Netflix), and even in the B2B market as Evans (2009) points out. For instance, Netflix combines the lock-in cycle with network effects to enhance its value proposition by utilizing user's feedback to create original series and movies. Therefore, Netflix increases its switching costs by understanding users' preferences and recommending relevant content to them.

Besides the changes above that were enabled by the advent of the internet, it is crucial to consider that for e-products, they do not present any inventory costs. Hence, some business can present a wide range of e-products, allowing customers to decide which information he/she wants to consume, electing themselves which products have higher quality than others (e.g., Amazon's Kindle platform, YouTube). Besides, to establish a virtual business, not owning any physical asset, increases its scalability considerably reducing its marginal costs (e.g., Uber, Airbnb) (PARKER; VAN ALSTYNE; CHOUDARY, 2016).

Concerning the platform behavior in the digital economy (REILLIER; REILLIER, 2017), explain that the platforms' competitive scenario can be described in three competitive pressures. They follow as Table 7.

Table 7 – Competitive Pressures of Platforms

Competitive Pressures	**Decisions to be taken**
Competition from within the ecosystem	Considering that the platform opens its value creation to other players (through API, e.g.), this player may represent a threat if that feature becomes a "must-have" complement. For instance, if some add-on of Facebook becomes very important, the platform should consider: (i) to acquire this complement; or (ii) to duplicate this feature dispensing that player.
Competition from another platform	Facing a direct competitor, the platform should consider: (i) to focus into the needs of another side bringing more value to them; (ii) acquire small competitors, even those in a different location – known as "me too" competitors; (iii) focus on big enough niche segment; (iv) seek for alternative payment methods to reduce transaction costs to address the price-sensitive segments of the market; (v) create barriers to the growth of other players by establishing an ecosystem through partnership.
Competition from traditional players outside	To face a competitor which its business model is not a platform. It is suggested (i) to engage with regulatory authorities, government and policymakers explaining the value the platform bring and understand what regulations hamper their development; (ii) provide regulators with data to secure concerns regarding fraud, consumer protection, etc.

Source: Prepared by the author based on (REILLIER; REILLIER, 2017, p. 130–132; 187–188)

Furthermore, it is also important to consider that the network effects are not a guarantee of the creation of high barriers to entry (HAGIU, 2015). The same authors state that the elements that influence the switching costs and multihoming are also responsible for that barrier – which asks for a proper architecture at the right phase of the platform's growth.

To conclude this section, in the digital economy and platform competition, another competitive force that platform presents concerns the economies of scale. Usually, traditional businesses present economies of scale on the supply side (supply-side economies of scale); which means that the unit cost of production reduces when the volume of production increases (SLACK; BRANDON-JONES; JOHNSTON, 2015). On platforms, there is a demand-side economy of scale, which, the lesser are the cost to serve a user when more participants are in the platform (HAGIU, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017). However, despite some authors affirm that the demand-side economy of scale is a characteristic of the platforms (HAGIU, 2015) state that it is not every platform that exhibits this benefit.

In this section, it has been explained the dynamics of the digital economy strategy, focusing on the platform competition strategies. Since the platform phenomenon has emerged dominating many industry sectors, for mobility, this could not be any different (PARKER; VAN ALSTYNE; CHOUDARY, 2016). The section that follows moves on to consider the architectural elements of mobility platforms; we aim to answer the

following question: what are the main features of the platforms that operate on the mobility sector?

2.4 Shared Mobility Platforms

Recently, environmental issues have risen the questioning of individual mobility modes and the car ownership model. Hence, new mobility business models have emerged competing with traditional ones (Antonialli et al., 2017; Attias & Mira-Bonnardel, 2016; Mahut, Daaboul, Bricogne, & Eynard, 2015).

In this sense, these alternative forms of mobility can be understood through the lens of Product-Service System (PSS). The newer business models rely on access to the service (transportation) dispensing the need to own a vehicle, which configures a use-oriented mode (TUKKER, 2004). This is the case of the taxis, car rentals, shared mobility which includes: traditional Public Transportation services (PT), such as buses and trains, vanpools, carpools, shuttles, Transportation Network Companies (TNCs, e,g, Uber, 99, Lyft, Waymo, etc.), carsharing, bikesharing, and scooter sharing (SHAHEEN, S. A., 2014).

Therefore, respecting this paradigm shift, the SAE Shared and Digital Mobility Definitions Task Force, released a standard that defines shared mobility as “the shared use of a vehicle, motorcycle, scooter, bicycle, or other travel mode; it provides users with short-term access to a travel mode on an as-needed basis” (SAE INTERNATIONAL, 2018, p. 7).

In this sense, SAE’s presents a standard with a wide range of definitions, which to the extend of this study regarding business platforms, the applicable terms are shown in Table 8 along with an example. It is important to highlight that the applicable terms for this research encompass the mobility forms within the e-hail form, which by definition is “to dispatch a driver on-demand using a smartphone app, or website” (SAE INTERNATIONAL, 2018, p. 9)– note that all the examples given operate in a platform business model.

Table 8 – Shared Mobility terms and definitions related to this study

Terms	**Definition**	**Example**
Operational Model	It defines how does the mobility service is offered in trip terms.	-
Station-Based Roundtrip	A travel mode that is returned to its origin	
Station-Based One-Way trip	A travel mode that is returned to a different designated station location.	Car2Go and Zip Car

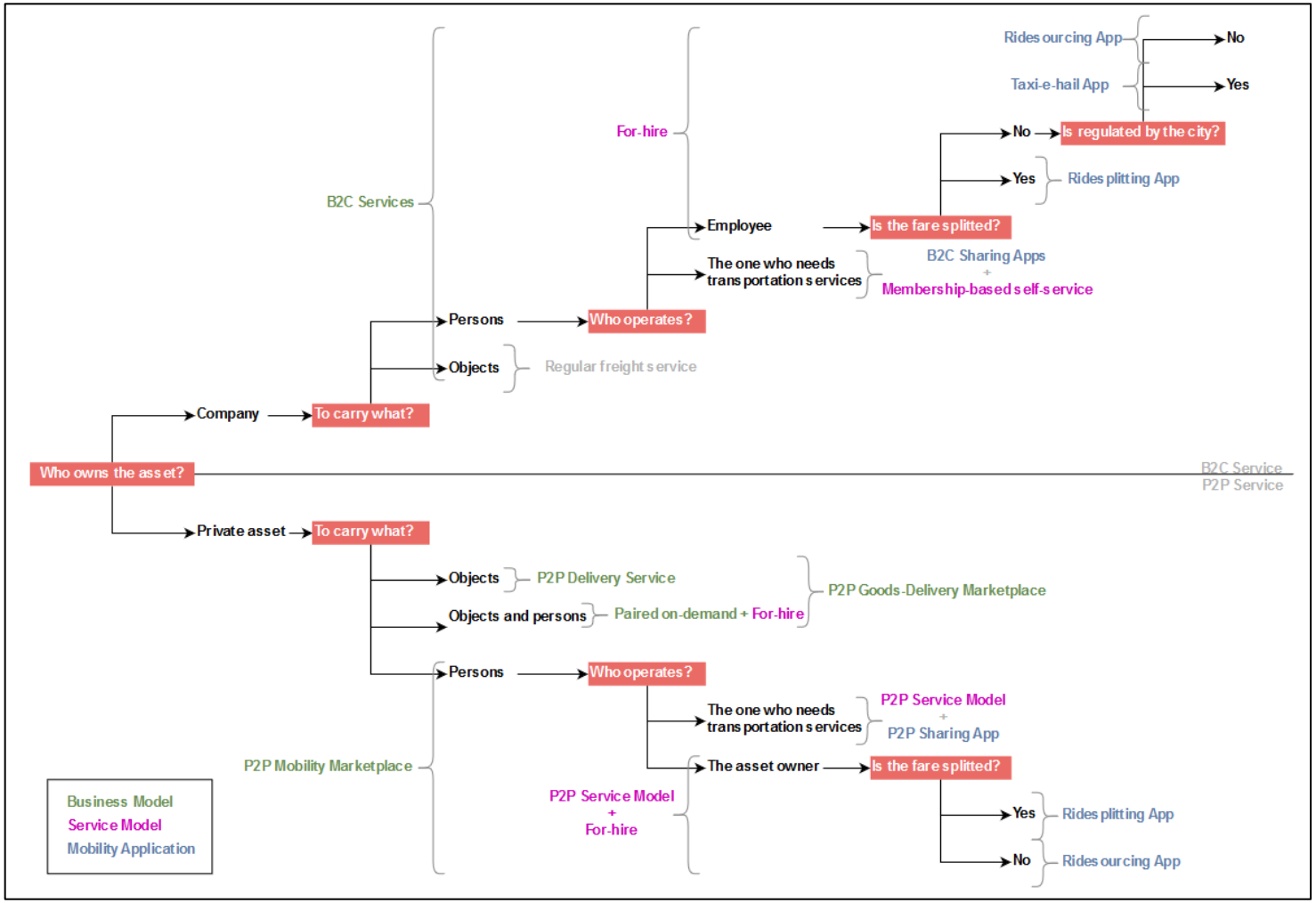
Terms	Definition	Example
Free-Floating One-Way	A travel mode that can be returned anywhere within a geographic area.	Yellow Bikes and Scooters, Grin Scooters
Travel Models	Describes the various travel modes to meet the diverse needs of users	-
Ridesourcing	Services prearranged and on-demand transportation services for compensations (charge a fare above the actual cost of driving) in which drivers and passengers connect via a digital application (used for booking, electronic payment, and ratings). Ridesourcing services are not allowed to street hail (on-demand does not include street hail).	Uber, Lyft, Cabify
Ridesplitting or Ridesharing	A ridesourcing service offered to more than one traveler.	Uber Pool, BlaBlaCar
Personal Vehicle (PV) Sharing	The sharing of privately-owned vehicles, where companies broker transactions between vehicle hosts and guests by providing the organizational resources needed to make the exchange possible	Turo, RentMyCar, moObie.
Mobility Applications	Describes in more depth the *channel* of mobility application that assists users in planning or understanding their transportation choices increasing their access to alternative travel modes	-
Business-to-Consumer (B2C) Sharing Apps	Sell access to shared transportation vehicles, equipment, and services from a business to an individual consumer, including one-way and roundtrip sharing – refers to the asset, only.	Car2Go, DriveNow, Zipcar
P2P Sharing Apps	Enable private owners of transportation vehicles or equipment to share with other users generally for a fee – refers to the asset, only.	Turo, moObie, RentMyCar,
Ridesourcing Apps	Provide a platform for sourcing rides;	Uber; Lyft; Uber Pool, BlaBlaCar
Taxi e-hail Apps	Provide internet-based, location-aware, on-demand hailing of regulated city-taxis.	Easy Taxi, Cabify
Ridesplitting Apps or Pooling Apps	A platform for sourcing rides in which the fare is split among multiple strangers who are traveling in the same direction.	Uber Pool, BlaBlaCar, Waze Carpool
Service Models	Describe how mobility service is delivered (the *customer relationship*) to the traveler. Shared mobility service providers may offer more than one service type.	
Membership-based Self-service models	Require that the user sign up for membership to use a service (e.g., carsharing) offered by a company, which users are able to access the asset without the need of another person. This service is also characterized by short-term access.	Car2Go; DriveNow; Uber, Lyft, Turo, RentMyCar, BlaBlaCar, Uber Pool
Peer-to-Peer (P2P) Service Models	Private companies manage transactions (for a fee) between hosts and guests of an asset, by providing the organizational resources needed to make the exchange possible. In this model, the user owns the vehicle,	Uber; Lyft; Turo; RentMyCar; BlaBlaCar; UberPool

Terms	Definition	Example
	rather than a business or organization as in the membership-based self-service models.	
For-hire Service Models	The fundamental basis of for-hire services is a passenger hiring a person operating the asset for a ride; it can be prearranged through a reservation or booked on-demand through phone, street hail, or e-hail.	Uber, Lyft, BlaBlaCar, Uber Pool, Taxi
Business Models	Characterize the service of different methods of commercial transactions used	
Business-to-Consumer (B2C) Services	Provide individual consumers with access to business-owned and -operated transportation services such as a fleet of vehicles. Car, bike scooter rentals are in this category.	Yellow Bikes and Scooters, Zipcar Carsharing, Motivate bikesharing, FedEx, DHL delivery
Peer-to-Peer Goods Delivery Marketplace (P2P-GDM)	To connect a courier using a vehicle, bicycles or scooters to deliver goods for monetary compensation using an online application or platform.	Glovo, Uber Eats, Rappi
Peer-to-Peer Delivery Service (P2P Delivery Service)	To deliver goods collecting a fee using their own private vehicles.	Glovo, Rappi, Uber Eats
Paired On-Demand Courier Services	To deliver goods through a for-hire scheme. For-hire service models are allowed to execute courier services.	Uber Eats; Rappi
Peer-to-Peer Mobility Marketplace (P2P-MM)	To offer a marketplace (usually as an online platform) to facilitate transactions among individual buyers and sellers of personally owned and operated mobility services, in exchange for a transaction fee.	Uber, Lyft; Turo; RentMyCar, BlaBlaCar, Uber Pool

Source: Prepared by the author based on (SAE INTERNATIONAL, 2018, p. 7–13; SHAHEEN, S. et al., 2017; SHAHEEN, S.; COHEN; ZOHDY, 2016)

It is worth mentioning that at some point, the terms seem to present the same definitions. However, according to SAE International (2018), the terms are used in different categories (e. g. Business Model, and Service Model categories). Considering this, in order to facilitate the analysis, mainly due to the most confuse categories (service model, business model, and mobility application), we opt to organize by asking five questions, which hereby will be referred as axis: (i) asset ownership; (ii) objects and persons; (iii) driver; (iv) fare; (v) regulation. Those are shown in Figure 7.

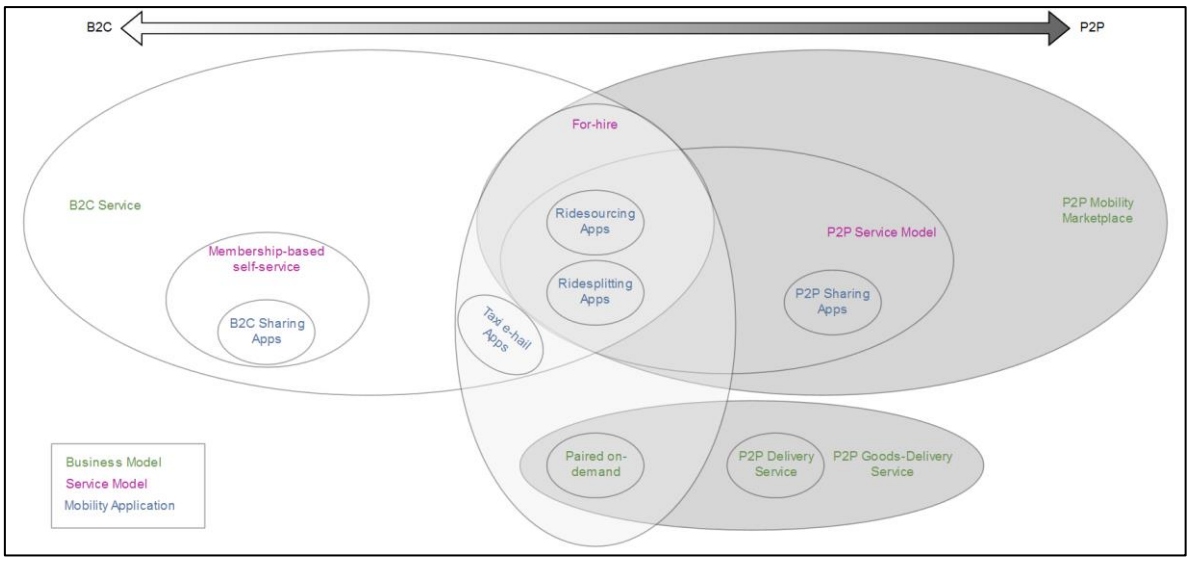
Figure 7 – Business Model, Service Model and Mobility Application delineation



Source: Prepared by the author based on (SAE INTERNATIONAL, 2018, p. 7–13; SHAHEEN, S. *et al.*, 2017; SHAHEEN, S.; COHEN; ZOHDY, 2016)

Still, in order to provide a better comprehension of the conceptual relation of those terms, Figure 8 presents a Venn Diagram.

Figure 8 – Venn Diagram of Shared Mobility terms



Source: Prepared by the author based on (SAE INTERNATIONAL, 2018, p. 7–13; SHAHEEN, S. et al., 2017; SHAHEEN, S.; COHEN; ZOHDY, 2016)

Considering Figure 7 and 8, it can be noted, by definition (SAE INTERNATIONAL, 2018, p. 7–13; SHAHEEN, S. et al., 2017; SHAHEEN, S.; COHEN; ZOHDY, 2016) that:

- For-hire is the only intersecting category between a B2C or a P2P business model and it is composed by ridesourcing apps and ridesplitting apps;
- Membership-based self-service does not apply for P2P business;
- There is no Service Model for P2P Delivery Service business model. P2P Service Model does not apply since in this model the company broker a transaction to allow asset owners to rent their vehicles.

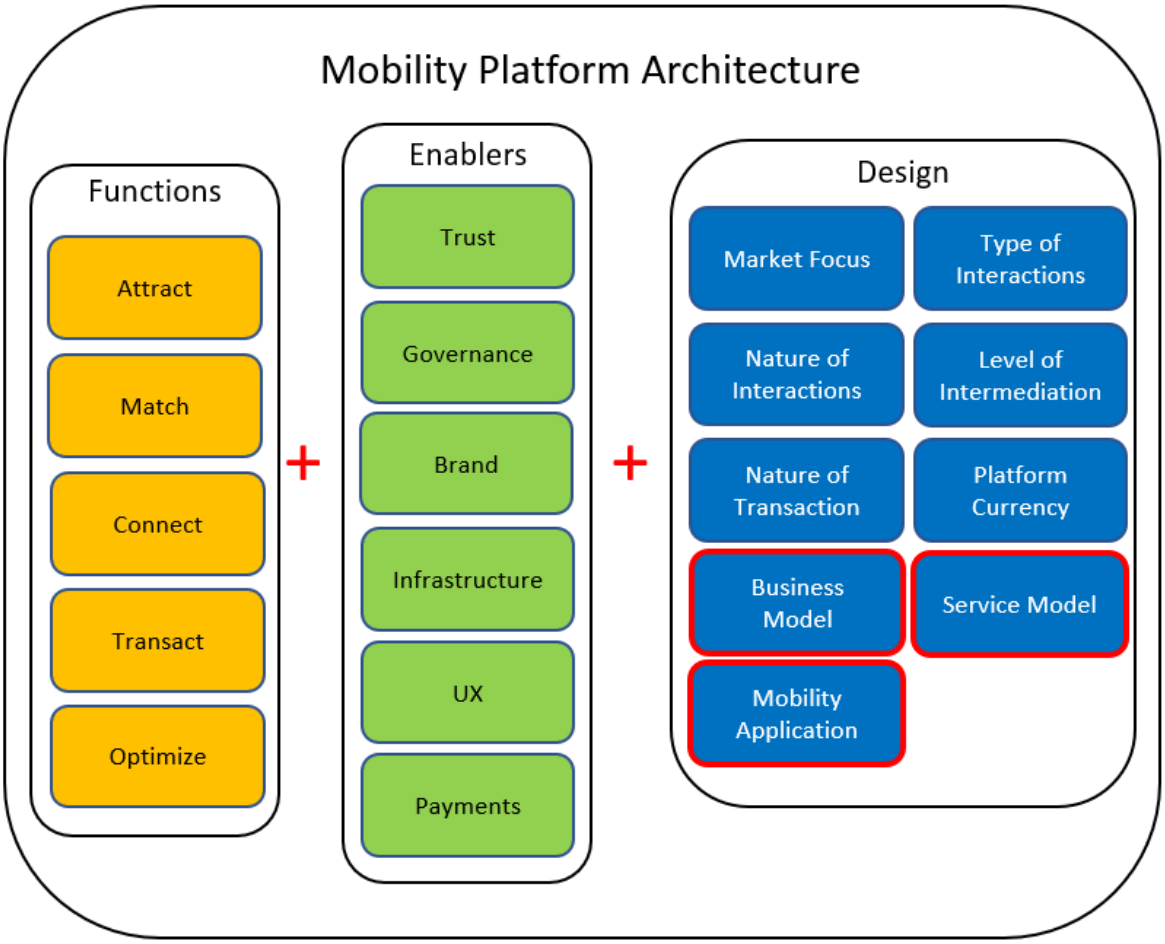
Thus far, this dissertation has explained the theoretical lens used to study the local mobility platforms, considering the focus on the ridesourcing and ridesplitting travels. The theoretical background, then, has reviewed the business model patterns, which we focused on the business platforms. Concerning the platforms, the architectural features, functions varying through the platform growth phases were presented. Growing toward the maturity growth phase, the platform faces a digital economy scenario in which it must manage its strategic features in order to thrive in the sector; specifically, the peer-to-peer

mobility platforms. In view of the main concepts, I will move on to discussing how to analyze the architecture of shared mobility platforms.

2.5 How to analyze the architecture of Shared Mobility Platforms?

In order to analyze the architecture of Shared Mobility Platforms, through the lens of the business platform theory, relations must be done between the mobility classification and the theory. Thus, in order to sistematize the relations, we propose a theoretical framework, shown in Figure 9.

Figure 9 – Theoretical Framework to analyze the Mobility Platform Architecture



Source: Prepared by the author.

3 METHODOLOGY

Turning now to the development of the study, considering that the general objective is to identify how does the local mobility platforms operate in the market, the present section aims to describe the research type and the methodological procedures. First, it is important to highlight that this study was developed in chapters. This was done in order to facilitate the understanding of the reader.

This research is (i) exploratory since we aimed to bring more familiarity with the local mobility platforms; (ii) descriptive, in order to describe how do these platforms operate presenting its characteristics; (iii) qualitative nature since this theme is incipient with few studies as described in the introduction (GIL, 2002).

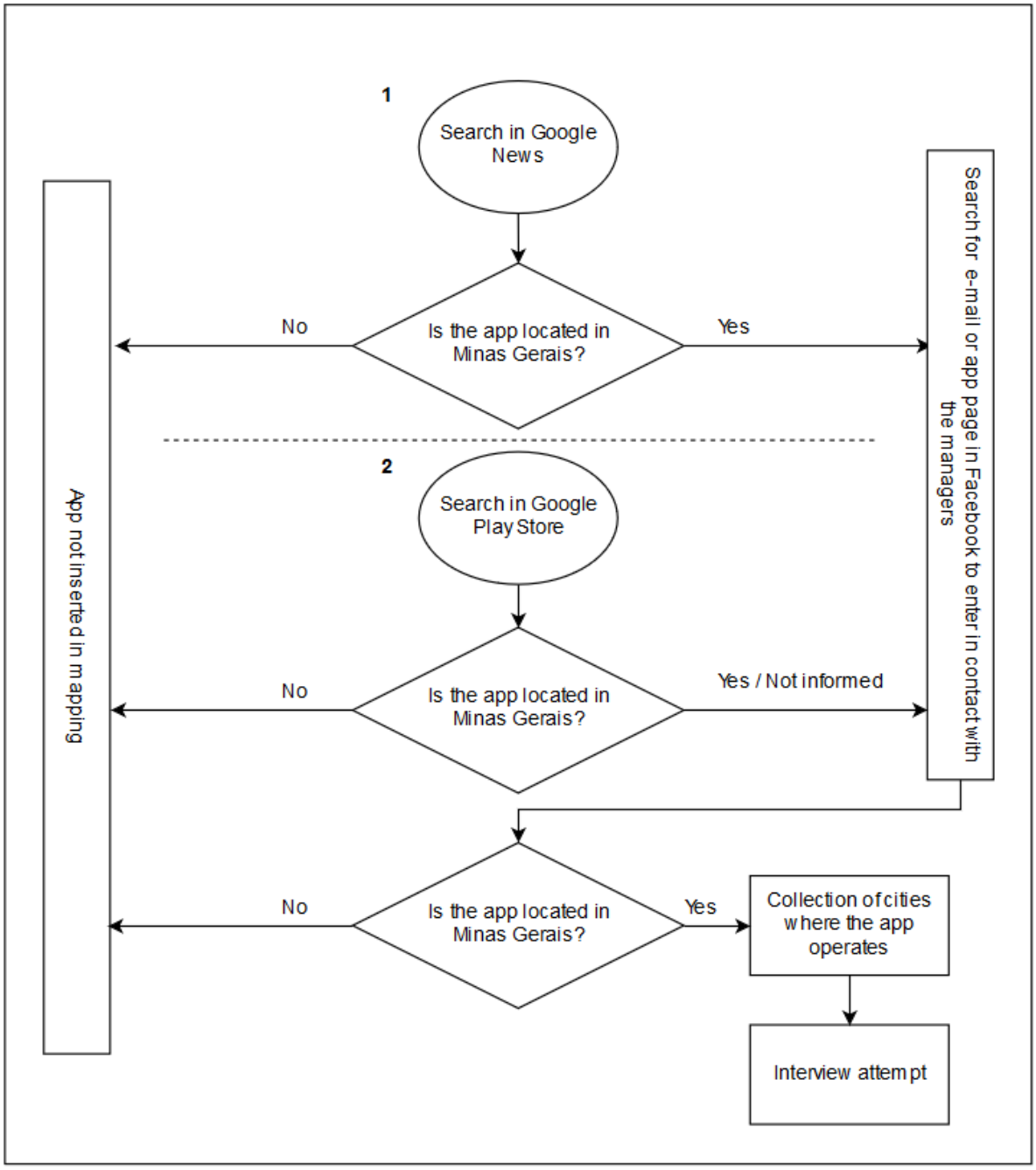
First, we mapped the local mobility platform in the south region of the state of Minas Gerais, Brazil. We took as a departure point the data obtained on previous work done on local platforms in this region3, which the researchers asked in a survey which local platform the respondents have used. Therefore, we used the snowball sampling technique (PENROD et al., 2003) in order to find other local platforms in the region.

This mapping was also done by documental analysis in the grey literature (GIL, 2002), using the following terms in Portuguese in Google News, Facebook and Google Play Store: “transportation application”, “mobility app” and “urban mobility app”. Saturation criteria (FONTANELLA; RICAS; TURATO, 2008) was used as a stopping point for data collection. First, we searched in Google News setting the location options to Minas Gerais. Thus, we obtained information from local news announcing a new local app in the region. This app was then included in the mapping.

For the platforms found in Google Play Store, we searched for the platforms using the aforementioned terms, and then checked if they operate in any city in Minas Gerais. If the site informed that the app operates in this state, we inserted the app in the mapping. If the operating cities were not informed, we looked for the app page on Facebook and sent a private message to the app page asking whether the app operates in Minas Gerais or not. If yes, we asked the cities and included the app in the mapping. After that, we tried to schedule a phone interview. This searching process is illustrated in Figure 10.

3 This was evidenced in a paper in which its submission is in progress

Figure 10 – Mapping process



Source: Prepared by the author

The final research corpus comprised 54 local platforms. Similar mapping is found in Antonialli (2019).

While mapping, we pre-characterized the local platform regarding its local activity, business model, service model, and mobility application according to the reference literature aforementioned. After that, we used convenience sampling (ETIKAN; MUSA; ALKASSIM, 2015), to select local platforms to execute (i) non-participatory observation (MARCONI; LAKATOS, 2003) through travels to characterize the

architectural elements and functions of the local platforms; and (ii) semi-structured interviews (IBIDEM) with the platform's manager, drivers and developers to capture the architectural elements that was not possible through previous methods; and the contextual environment which the platform is immersed. All the interviews were transcribed totalizing 224 pages. The overall data collection was made from April 3th, 2019 to January 29th, 2020.

In summary, Table 9 shows the material used to develop this research. The name of the companies was omitted preserving their anonymity. This also demonstrates a very informal characteristic of this phenomenon as it will be further elucidated. The passenger selected were commuters from the city of Lavras, not be possible to collect from other cities due to researcher limitations. We tried to contact two developers, however only one replied or messages and e-mails – their contacts were obtained while talking to the platform's managers.

Table 9 – Data collection description

<table>
<tr><th>Material</th><th colspan="3">Description</th><th>Time/Amount</th></tr>
<tr><td rowspan="19">Semi-structured interviews</td><td>Interviewee Role</td><td>Interviewee
Person X from company X // Person X driver in X companies</td><td>Interview Length (h:m:s)</td><td rowspan="19">13:09:58 minutes of recorded interview</td></tr>
<tr><td rowspan="8">Owners/
Manager/ regional manager</td><td>A (company A)</td><td>01:40:09</td></tr>
<tr><td>B (company B)</td><td>00:55:26</td></tr>
<tr><td>C (company C)</td><td>00:16:23</td></tr>
<tr><td>D (company D)</td><td>00:28:29</td></tr>
<tr><td>E (company E)</td><td>00:59:19</td></tr>
<tr><td>F (company E)</td><td>01:48:53</td></tr>
<tr><td>G (company G which is not in the market anymore)</td><td>02:14:08</td></tr>
<tr><td></td><td>Total</td><td>08:22:47</td></tr>
<tr><td rowspan="3">Drivers</td><td>H (1 company)</td><td>00:43:18</td></tr>
<tr><td>I (1 company)</td><td>01:07:37</td></tr>
<tr><td>G (3 companies)</td><td>02:14:08</td></tr>
<tr><td></td><td>Total</td><td>03:56:45</td></tr>
<tr><td>Developers</td><td>J (company J)</td><td>00:30:20</td></tr>
<tr><td rowspan="4">Passengers</td><td>K</td><td>00:15:35</td></tr>
<tr><td>L</td><td>00:31:13</td></tr>
<tr><td>M</td><td>00:38:57</td></tr>
<tr><td>N</td><td>00:44:36</td></tr>
<tr><td></td><td>Total</td><td>02:10:21</td></tr>
<tr><td>Documental analysis</td><td colspan="3">Google News (as informed in Figure 10)
Lavras: Jornal de Lavras, Lavras 24 horas, O Lavrense
Social Media pages and posts
Flyers from platform F</td><td>From 04/03/2019 to 01/27/2020</td></tr>
<tr><td>Non-participatory observation</td><td colspan="3"><table><tr><th>Platform</th><th>Travels</th></tr><tr><td>A</td><td>6</td></tr><tr><td>E</td><td>5</td></tr><tr><td>F</td><td>2</td></tr><tr><td>Total</td><td>13 travels</td></tr></table></td><td>13 Travels</td></tr>
</table>

Source: Prepared by the author

The interview script was developed based on item 2.2 and 2.5 of this dissertation. Different interview script was used for drivers (Appendix 1), managers (Appendix 2)

developers (Appendix 3) and passengers (Appendix 4). During the transcriptions, the interview script has been modified in order to obtain better results. The analysis of the data collect was done through content analysis (BARDIN, 1977) and it sought to (a) understand the platform architecture in terms of what are the functions, enablers and design elements; (b) whether there are more categories in these elements or not; and (c) identify specificities of mobility platforms.

According to the platform architecture, the composition of each analysis category follows Table 10. It is important to highlight that the Optimize and UX categories have grouped forming the category Improvements. This is due to the fact that the platforms depend on an external developer to analyze their data. So, as we will further explain, the platforms are often rented instead of developed by someone from inside the company or even bought. Thus, the manager does not have much data to analyze and make deeper modifications. The actions done to develop the platform relies on the managerial aspects.

Table 10 – Data collection description

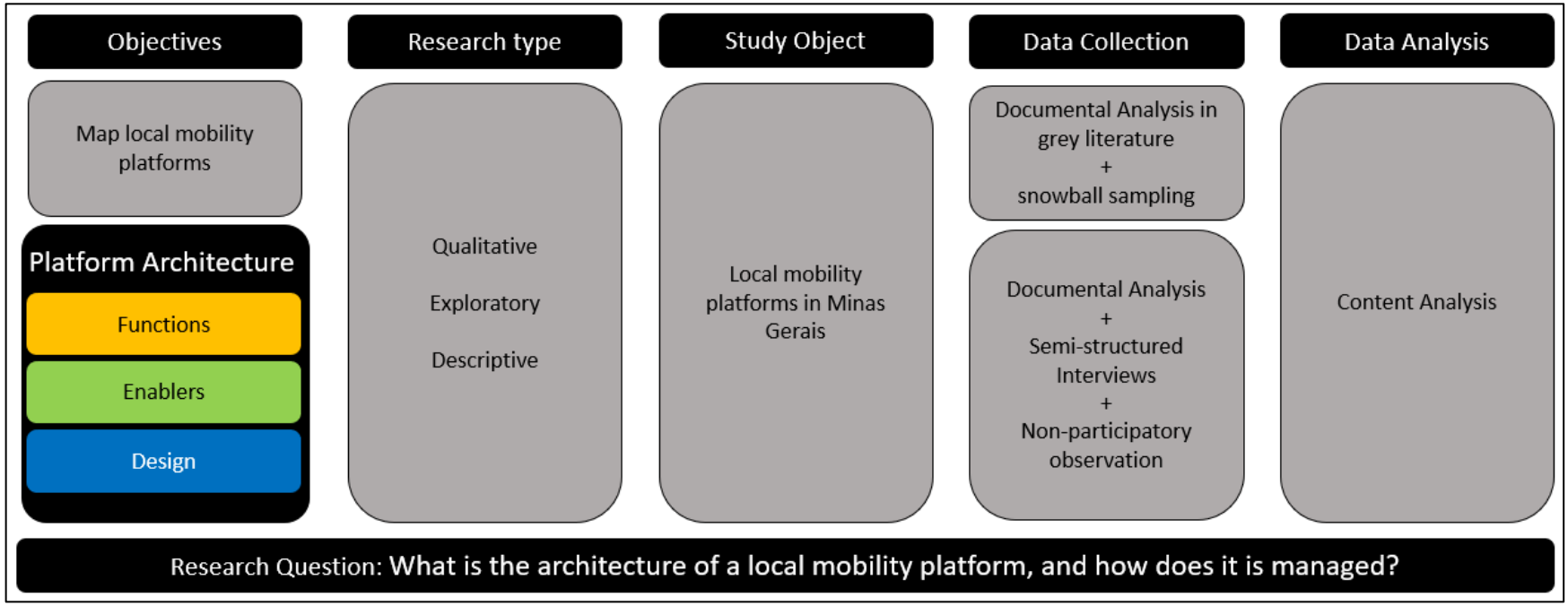
What?	**Platform Architecture**	**Analysis Category**	**Content**
Functions that the platform must execute to work properly	**Function**	Attract	How do they identify new participants? How to attract each participant? What is the value proposition for them?
		Match	How does the platform assign a driver to a passenger?
		Connect	How do the passengers and the drivers communicate and exchange additional information? Is that relevant? Why?
		Transact	What elements contribute to a good transaction of value?
		Driver Management	How does the relation between managers and drivers be essential to the success of these local platforms?
Factors that unleash the platform potential and drives to its success	**Enablers**	Trust	What makes the participants trust in the platform? What made it easier?
		Government	How do the rules are worked inside the platform? How does the legislation environment affect the platform?
		Brand	How do they create the service recognition process? What techniques are used to create an identity relationship with the users? What kind of actions do they use to differentiate one brand from another?
		Infrastructure	What is the infrastructure required to make the platform work? Which infrastructural elements make it work better?

What?	Platform Architecture	Analysis Category	Content
		Improvements	How does the user experience is evaluated?
		Payments	What are the methods used, preference and how to pricing?
Structural aspects of the platform	**Design**	Market Focus	What are the players that the platform should attract first?
		Type of Interactions	What is the number of players mobilized while seeking a match?
		Nature of Interactions	What is the objective of the interaction?
		Level of Intermediation	In which level does the platform intermediate the relation between players?
		Nature of Transaction	What is the characteristic of the value transacted?
		Platform Currency	What is the currency of the platform?
		Business Model	What is being carried and who owns the asset?
		Service Model	Who operates the asset?
		Mobility Application	Is the fare splitted among passengers?

Source: Prepared by the author

Figure 11 provides an overview of the research methodology that is intended to be carried out in this dissertation. Following, the next section will present the results found using the applied research method.

Figure 11 – Research Methodology



Source: Prepared by the author.

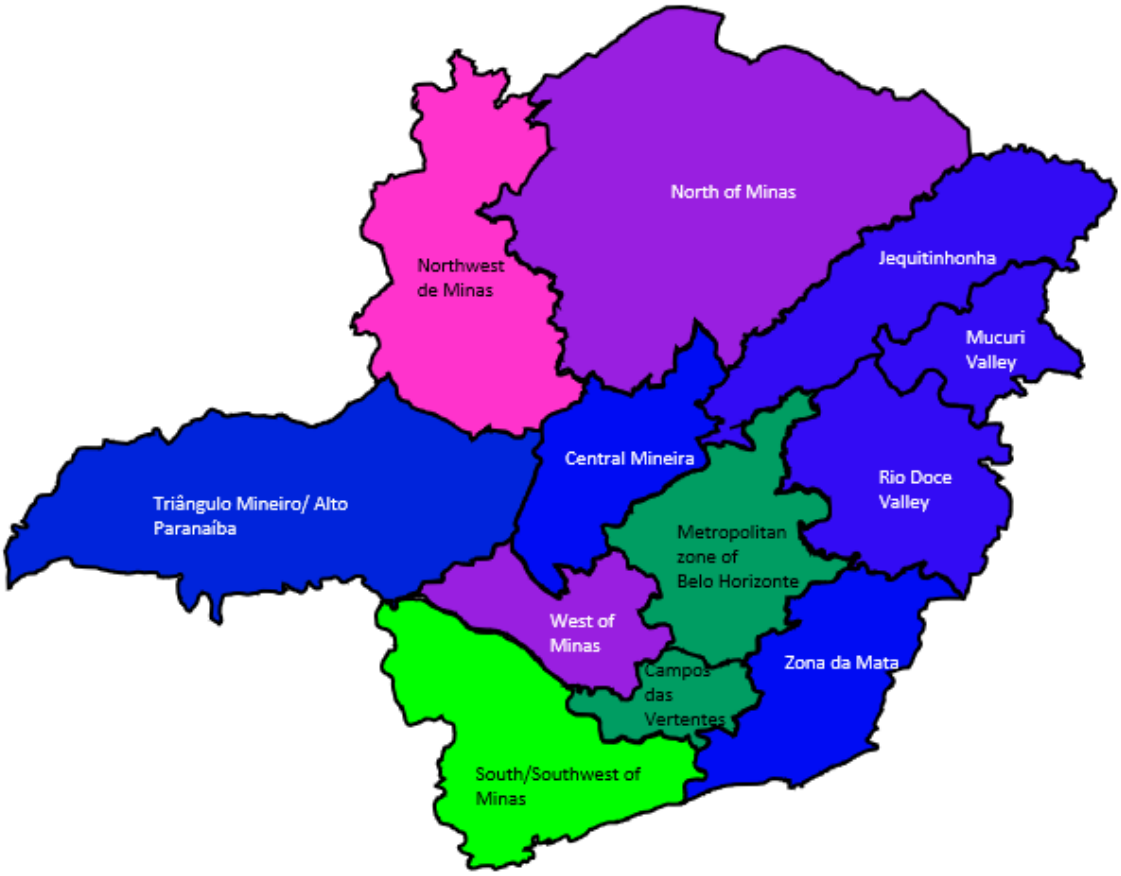
4 RESULTS AND DISCUSSION

This topic will present the results of this work considering the aforementioned employed methods and theoretical lens. The first set of this session will discuss the context in which this research succeeded covering a general panorama of the local mobility platform context. Next, each categorical analysis will be explored: the functions, enablers and design elements, also presenting the categories identified in the phenomenon studied which has not been explored by literature previously yet.

4.1 Research Context

First, according to the mapping made, it was found 54 platforms in Minas Gerais. Some of them operate in more than one city. Figure 12 shows a heatmap of the platforms on the regions of Minas Gerais as of January of 2020.

Figure 12 – Mobility Platforms in Minas Gerais



Region	Number of Apps	Number of cities that has platforms
South and Southwest of Minas	15	13
Campos das Vertentes	12	3
Metropolitan Zone of BH	11	15
Triângulo Mineiro/Alto Paranaíba	6	4
Central Mineira	5	5
Zona da Mata	5	52
Jequitinhonha	4	14
Rio Doce Valley	4	6
Mucuri Valley	4	2
North of Minas	3	11
West of Minas	3	3
Northwest of Minas	2	2

Source: Prepared by the author.

From the number of apps (*A*) and the number of cities that has platforms (*B*) in a certain region it is possible to observe that: when (*A*) is greater than (*B*) there are: (i) more than 1 app in a city; and (ii) as the difference between (*A*) and (*B*) increases, the more competitive is the market in that region. Therefore, we can see that in the region of "Campos das Vertentes" the market is considerably competitive, as there are 12 platforms for only 3 cities.

On the other hand, when (*A*) is minor than (*B*), there are: (i) at least one city with 1 app; and (ii) as de difference between (*A*) and (*B*) increases, the less competitive is the market in that region. Thus, "Zona da Mata" presents the less competitive market, as there are only 5 platforms disputing 52 cities.

The location which the interviewed platforms operate follows in Table 11

Table 11 – Operation Regions of the platforms interviewed

Platform	Operation Regions
A	Campos das Vertentes
B	Metropolitan zone of BH
C	Rio Doce Valley
D	South/Southwest of Minas and Campos das Vertentes
E	West of Minas, South/Southwest of Minas, Northwest of Minas, Metropolitan zone of BH, Campos das Vertentes and Central Mineira.
F	Campos das Vertentes
G	South/Southwest of Minas, Campos das Vertentes and Zona da Mata

Source: Prepared by the author

In general, all the interviewees reported that to manage a platform in an inner city is very different if compared to manage the platform in a big city. This difference becomes clearer when a manager state that:

> In Belo Horizonte (he was driving for Uber in this city) you look for the passenger. In Lavras (while driving for company F), you look for the passenger's house. There was a guy, these days, take a look (he showed me on his phone) … please, touch the intercom, in the observation [field] (…) It makes our life difficult, man! We lose a lot of customers, especially on party days… When there is a party, this… rodeo in the city, right, you have a lot of rides, man. It's so many people that it goes to the pending list. Occupies everyone… then it goes to the pending list. When a ride is over, it rings (the app) and you take another… and you drive… But the person is waiting inside his house… it makes difficult because we need to arrive, stop, board, and exit. So, we stop being an app driver to become a personal driver (Interviewee F)

The difference noticed by the managers regards the cultural aspect of people living in inner cities which corroborates to the literature findings that pointed out differences regarding the context (ACQUIER; DAUDIGEOS; PINKSE, 2017). Specifically, in the region where this research was carried out, the fact that population, in general, are not used to the technology, they tend to see the driver as someone who is totally on that passenger.

> Well, a normal person, that asks via the app, what he is gonna do first? He'll get ready. He'll take a shower, get ready, take his stuff, he'll keep everything in place, and after that, he'll ask a ride in the app. If it is a personal driver, no [it will not happen]. 3 hours before [he'll dial you and say] Hey (he said his name), please, at 11:40 could you take me here at UFLA? Here at this building? Sure! (he answered) 11:35 I'll be there. 11:37, 11:40, right on time, I'll be here. But you are not! You'll be quiet… you know that the car is there! You'll: Oh, my! 11:40! Then you go on the window, humm, let me see! Hey dude! I'm coming! (He said rising from the chair, simulating the action). Then you'll take your luggage, get all your stuff done, and… you will look at the coffee machine… Hum… I'll drink some… Ah, he (the driver) can wait a lil bit longer… 10 minutes! (…) It is tough because the lavrense (who was born in Lavras) does not have this culture [to use app]. (Interviewee G)

Thus, it can be seen that the passenger acts as if the driver is closer to the passenger when comparing to the well-established platforms such as 99, Uber and Lyft. The passenger interviewed L also mentioned that he feels like Uber is not that close and personal as a certain platform in his city – we will explore that on further category.

The managers still have hope that this culture will change (INTERVIEWEE F, G), however, some of them are discouraged.

> We run into the culture a lot! It is changing… As people use, it changes, you know? 7 thousand downloads (he said the numbers of downloads his app has) are 7 thousand people that downloaded… so it keeps expanding… but culturally, the city, the person, go to the app and call you, right? The person downloaded, asked for a ride, the driver arrives, it worked! But when the passenger gets in the car, he says: Hey, do you have a cellphone number that I can use to call you? (…) Our biggest challenge here in the city it's cultural! No doubt about that! It is not the fee, it is not drivers, no, nothing! It's cultural… (…) I keep on saying: call me on the app… I sent the link, link, link link… download the app! Call me there! (Interviewee A)

Moving on to more structural aspects, from the 54 apps mapped, it was also possible to find that 39 of them, including all of the interviewed platforms, they rent the software used from mainly 2 developer companies, which we tried to make contact but with no success. I was able to interview only 1 company (Interviewee J) that develops and sells the platform for the managers. The option to buy a platform it might be considered by the managers as expensive.

> (…) Each functionality has a price. The most basic app it costs R$ 42.000,00. Each functionality that you wish to add, we analyze and then we calculate what is the cost to implement. That is because, beyond the cost of development, you also have some monthly costs, right? The server, the payment gateway, google maps… so, these are some monthly costs to keep the app [online], and the responsibility to pay for these values is also on customers (the app owner). (…) Also, to put the app online in the App Store (the Apple apps store) you pay 100 dollars if I'm not mistaken, annually. And in Google Play (the Google apps store) you pay 50 dollars a single time. (…) (Interviewee J)

> (I asked how does it work if someone wants to make an app with them he answered me) So you must create your account with your [bank] card, we take all the access and integrate inside the app (…) the customer must make available all the required tools for us, and we do our work. (Interviewee J)

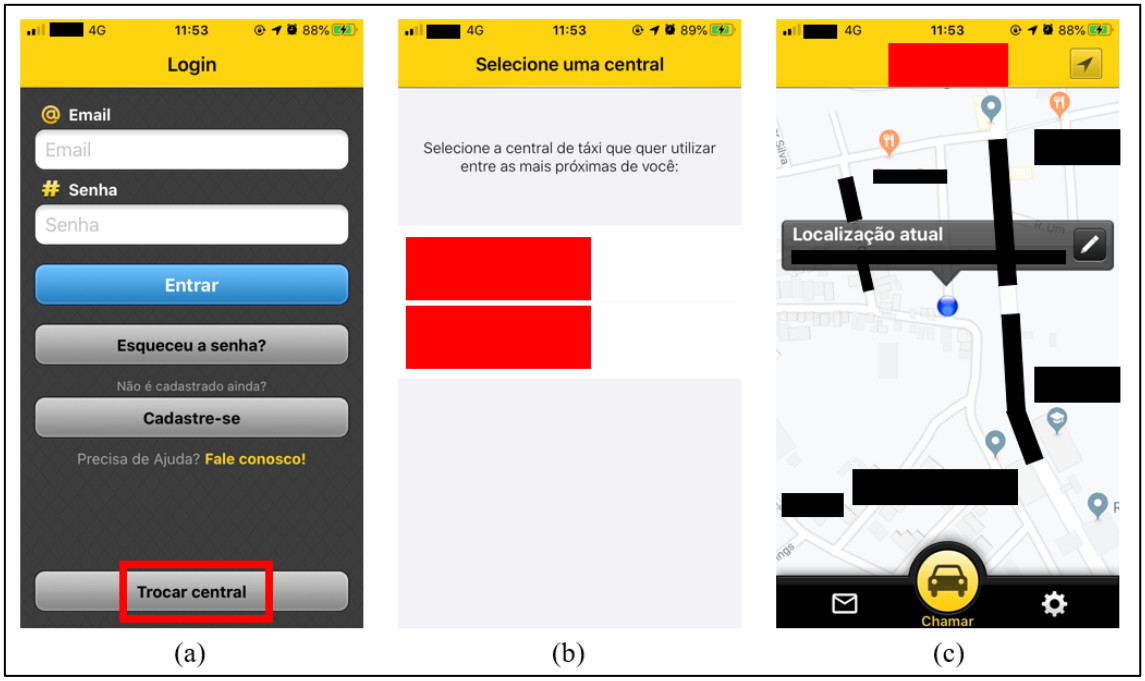
In case when the app is bought, the owner can use their creativity to develop distinct mechanisms within the platform. This is defined by something that the Interviewee J calls as a business rule.

> The business rule goes according to [to what] the customer (the platform owner) wants inside his app. I have customers that use bonification systems for passenger and drivers… I have customers that put multi-level marketing inside the platform! So, this is up to the customer… (…) The platform is fully customizable! (Interviewee J)

According to Interviewee F, when the app is rented there is a developer, normally that develops to the whole country. They show a demo app that includes the passenger, driver and manager app. Then, after the manager tests the platform, they chose which options and functions he would like to put in his platform. After that, the manager should send the logo of his company and pay a monthly fee. In general, for 20 drivers, the manager pays the same amount. For more than 20 drivers, the value is readjusted according to the insertion of each driver.

The platform is composed by 3 softwares: one for the manager who will lead and manage the drivers, define the rules for each function within the platform and understand passenger's demand, other for the drivers who will use to receive calls for rides from the passengers, and another software for the passengers that will use to call rides. And, indeed, the app interface from the platforms mentioned by Interviewee F is exactly the same from other apps, as they are from the same developer – Figure 13.

Figure 13 – Interface of two mobility platform in the same city that shares the same app



Source: Prepared by the author based on research data

In Fig. 13 it is clear that different companies use the same platform and app. When the passenger is logging in (a) he may hit the button “Trocar central” taking him to screen (b), which he chooses in which company he wants to call a ride (the red blocks are the company names and logo available on that city). After logging, in (c) at the top of the screen, in red, the company logo chosen appears. However, as investigated, although the interfaces are exactly the same, and also operating in the same city, the way each company is managed makes a difference in drivers’ and consumers’ choices. Thus, all the research conducted investigated the practices adopted within those softwares.

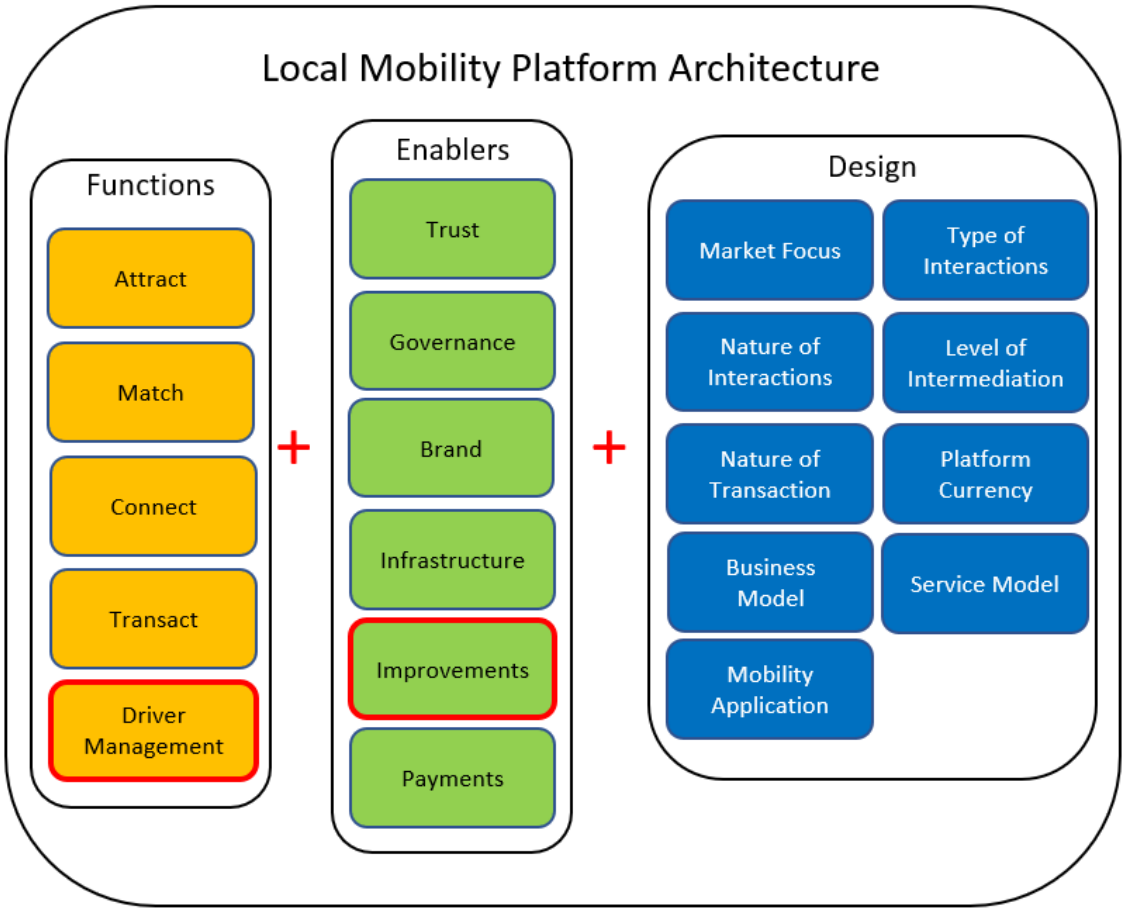
It is also important to highlight that the Interviewee F tried to rent a platform from a different developer. But as he explained, some managers make legal agreements with the developer stating that the developer will not rent his platform for another company in the same city. In this case, there is another company, in the same city, that uses a different platform, and in this city, only this company operates with this platform.

On the following topics, it will be presented the results found for each analytical category of the platform architecture.

4.2 Discussion of the Analytical Categories

This topic will discuss the management practices used to manage mobility platforms. It is structured according to its architecture. Hence, the following topic discusses the functions that the platform must develop. Following it will be presented the enablers categories, and finally the design elements. The functions and enablers are presented by discussing each element and for the design architecture, we opted to discuss a table due to its structured and rigid nature, which does not change much from one platform to another. After that, we will explore a peculiarity found with respect to the network effects. The overall architecture of the mobility platform is seen in Figure 14.

Figure 14 – Local Mobility Platform Architecture



Source: Prepared by the author.

Still, with respect to Figure 14, it is worth to highlight that due to the informal structure of the platforms, the brand building process is not organized. In this case, the brand category will be presented along with the whole session of functions and enablers. Following, on the Final Considerations topic, we opted to describe the managerial

contributions' suggestions to strength the brand jointly with other actions we recommend to the platforms.

4.2.1 Attract

In general, managers attract drivers by offering them more benefits than other platforms. These and another characteristic feature of this function is shown in Table 12.

Table 12 – Characteristics of the Attract function in Local Mobility Platforms

Function	**Strategies**		**Brand elements in attract phase**
Attract	**Drivers**	**Passengers**	Creation of identity relation between the driver and customer segment to attract passengers through drivers;
	-Social media, recommendation; - Secret calling drivers; - Low fees charged and other benefits; - All drivers are interviewed	- Social media, digital influencer, flyers, advertising sound car, radio; - Friends, relatives, and accquaintaces of the drivers; - Low prices;	

Source: Prepared by the author

Since many managers are also or were drivers, in other platforms, their discourse regarding the life of being a driver in a platform is covered with hate for the platforms that operate in big cities such as Uber and 99. Their biggest complain regard the fares paid to the platform.

> Logically, we do not work with the Uber's fee! We do not work with 99's fee because the human being needs to survive! (Interviewee E)

> Our fee is way cheaper than Uber! Uber charges from 25 to 40%. We charge only 12%! So, the driver would rather work with us! (Interviewee D)

> Nowadays the biggest sin of Uber is to not worry about the driver. (…) it sees the market, the manpower, a third-world-country with a lot of unemployed people… The people need [to work], so whatever it comes… (Interviewee A)

> This dissatisfaction, mainly from the drivers, regards the taxes charged from the big platforms, right? The drivers make less [money] working for Uber. And when you have the regional app, the driver is much more valued. (Interviewee J)

Also, Interviewee H and G claim that in cities where the geographical relief is hilly, the fees charged are not fair since the drivers usually spend more fuel to drive. Thus, the operational aspects influence the business model of the company.

> Lavras is a city with very hilly terrain. Lots of slopes… The fuel consumption is sky-rocketing! So… fuel it's on me… [mechanical] wear it's on me! Everything it's on me! Uber has a very low price… and then charge me 25% of the ride… (…) I will not get a dime… (Interviewee H)

> Lavras is a very hilly city. So, the fuel consumption, the maintenance… all of those expenses on the driver, it makes difference! You change the gear all the time! You'll spend more fuel, oil, clutch more than if you live in Santos (a coast city in the state of São Paulo) which [the streets] are all plane… (Interviewee I)

Thus, the local platforms, by charging fewer taxes become more able to attract a driver. To attract the attention of drivers, they often post on social media.

> It is no use having a passenger if you don't have a driver. You will make the ride due to the passenger; you must have a driver! It is logical that the first thing you will do it is to post asking for drivers, hiring drivers! (Interviewee C)

> (When I asked about how they attract drivers, he answered me) We promote the app in Facebook, Instagram… more on social media! (Interviewee D)

In addition, when an existent platform tries to enter another city, they go to the city that they wish to enter and tries to make a ride with a driver. When the driver accepts the ride, some platforms show the telephone number of the drivers. Hence, the incumbent platform saves the driver number, and then cancel the ride. Some minutes later, this driver will probably receive an invitation by text message or a call, to go to another platform. The incumbent platform is exploiting what Reillier & Reillier (2017) call as Information Leakage – is information utilized by the users to do something which is not the objective of the platform.

> (...) a rival company is arriving in the city. Every rival company does that. They call [a ride] in the app… they call, and cancel… they call and cancel… they call and cancel… and they take the phone number of all drivers… (…) and after that, they send an invitation offering to drive for them (Interviewee A)

After identifying potential drivers, managers analyze the potential market that can be achieved with the social bonds that the driver has. For example, if the driver is a student at certain faculty or school, the manager understands that this driver is able to enter that market. The same for different neighborhoods, and small villages near the city.

> So, each driver may have a potential profile! When I will put a driver, I don't analyze his availability only. I analyze which [social] group he is inserted that will be useful. For example, today I'm with 2 students from

> Faculty X. I had 4! (…) Because these guys are in the groups... agronomy... business' group… where have parties… course groups, I mean! You are making a course; you may have a group there! So, I can enter in these markets by them. (…) These drivers have the potential to reach groups that I can't! (Interviewee A)

> Many drivers bring [passengers]... But is not that much! But it helps. (...) Yesterday, there was a driver who worked as secretary of something in the past city council mandate, and he did something for Itirapuã (a village near Lavras) (…) So, this guy told them about the app and then he brought people from this community to the app (Interviewee F)

Thus, with respect to the enabler brand, it is possible to understand that the managers strive to create an identity relation from their driver with different customer segments. By searching different drivers for different markets, they create an identity relationship that attracts passengers through the drivers. Corroborating, an interviewee who worked for all the platforms in a city noticed that different platforms have different customer segments. But when two or more platforms share the same driver, which the passengers interviewed L and M already noticed, the driver acts as a bridge to bring passengers from one platform to another.

> Each app has a different profile (he meant customer segment) (…) the way someone is, right? Perhaps his social class… this normally is different from one app to another… For example, (company X) is a profile… (company Y) is another profile, more similar to (company Z). Many people from company Y went to company Z. Why? Company Z allows drivers to work with A, B, C, D platforms… so a driver that works in an app, brings riders to other. For instance, I was your driver (he mentioned the ride that I did with him). And then you look a luminous sign in my windshield… Hum, (Company Z)? What is that? (he simulate my questioning) It's another app, similar to Company Y too! – let's suppose that you asked a ride through Company Y. Ah really? Look, it's cheaper! And then you'll think… Hum… it's cheaper and I'll take the same driver… the same car… why will I pay more? So you'll download the Company Z app and you'll ask rides there. (Interviewee G)

It is important to highlight that Interviewee G made clear that a passenger might go from one platform to another due to a small increase of value offered from one platform. This is reinforced when Interviewee M reported that she called the same ride on two different apps. The passenger explained that the same driver accepted on both apps. However, after that, the driver cancelled the ride on one of the platforms excusing by saying that the car had a flat tire, and followed the ride on another platform, normally. Moving on, seeking to understand the profile of the potential driver, the managers often do an interview with him. Once again, it can be seen clearly the manager working his brand identity.

> You'll not enter my app without research… if I don't go visit your house first… (…) I'll go to your house to know… where do you live, to have an idea of who you are… (…) I want to see your context. We'll talk, I'll ask you about your expectations, your availability, what you think about that and that, and so on… (Interviewee F)

As a result, attract drivers is seen as a potential way to attract passengers since many rides made on those inner cities' platforms are called by acquaintances, friends, and relatives – which corroborates with the strategy of use producers to attract the other side (PARKER; VAN ALSTYNE; CHOUDARY, 2016). In this case, many drivers reported that they receive a considerable number of rides outside the platform: through text messages or calls.

> …we started with the clientele of (the manager's name) (…) He had some passengers, and… one way or another a driver has passengers that call him on his private number, right? The passenger calls! And… So, he got all the passengers he had, everybody, that he knows, and put in the app. Which is something I also did (to put all of his clientele in the app) (Interviewee I)

After the driver is contacted outside the platform, he must execute an operation within the platform that they call "open the door handle". The door handle refers to the car's door handle, which the driver starts a ride for the passenger in his driver app. Although "open the door handle" might be an interesting way to solve chicken or egg problem and kick off network effects, it presents two risks. The first regards the fact that since the platform has no data regarding the passenger one can say that a certain passenger did not enter the car. As a result, a manager reported criminal problems.

> There was a passenger, who today has 28 rides in the app… 28 rides done! In 3 months, [it means that] she uses a lot. And she has the habit to call [dialing, personally, the driver]. Then I tell her, call [a ride] in the app, use the app. And then she called this driver [dialing, by phone]. Then, the driver said, oh, okay, I will get you! Then, he went, got her, he opened the door handle for the woman, she entered the car, and he brought her home. When she got out of the car, she entered her house, and the driver's phone rang for another ride through the app, a common ride. He accepted, took the passenger. She (the second passenger) entered the car, and he drove her to her destination. But when he arrived [at the destination], she (the passenger) saw a phone on the seat and took that cellphone for her (she stole the cellphone of the previous passenger). But she failed when asking the driver: is that your phone? And he answered: no! But I think he was kinda entertained with the payment process, the card, or something like that… he didn't notice… she robbed the cellphone… When she got out of the car, after 10 minutes, the other passenger called (the first passenger), from another phone… hey, I left my cellphone inside your car! Where is it? He looked inside the car… [and thought] where is her cellphone? It was not there. I was in São Paulo, then, he called me, explained to me the whole situation, and, I said, call the passenger (the second passenger, who stole the phone) … tell her that the phone is with her… He called, and

> she said, no, the phone is mine. If you want to come here you will see my password, my pictures… And indeed! At that time, I was searching in the system… and I saw that he opened the door handle for the first woman. I called him and said: What are we gonna do now? We do not have any registry about the first ride… We will have to call the police… (Interviewee F)

The second risk is to provoke dissatisfaction and distrust feeling on the drivers that were not called since to call specifically someone by dialing unbalances the distribution of work for the drivers. Thus, a driver that might be more proper for certain work (due to his positioning, for instance), will not work. And he will probably feel wrong because he did not get a ride.

> I have a driver that he lives at Rancheira (Rancheira is an isolated neighborhood in Lavras). So, he gets out of his house, go to the city center… He stays up all night inside his car until 5 am. So, you see that the guy works hard, man and that he needs to work! One would do such a thing without need. So, he's there! And, thus, suddenly, there's a driver, who comfortable is in his house and receives a call (someone dialing him)?! (the manager shows indignation). This is wrong, man! This is disloyalty! This is not right for me! (Interviewee F)

As long as the app has drivers, it needs to keep them attracted. To do so, it was found that what makes the drivers in the platform is the number of rides. Having rides, the platform will be able to have drivers.

> (When I asked about what makes a driver leaves the app Interviewee G answered) Rides, merely. (…) Having more rides, he goes to another app. Absolutely! I say that because I'm in two apps because of that. I need rides… I have a family… (Interviewee G)

> Having rides motivates the driver because they see results! When he turns on the app, it rings! (…) What tires drivers is not the work. What tires them is the lack of results. So, if the driver has results, he goes until exhaustion! There is no problem! (Interviewee A)

The techniques to attract passengers that are not acquaintances, friends or relatives to the platform are performed via social media, and also in the city with flyers, posters, according to all the platform's managers interviewed. Also, Interviewee M reported that she knew the platform when a digital influencer posted on her social media. One of the platforms also uses radio with a particular objective:

> It was on that vacation period of almost 3 months at the university! It was horrible! So, I thought that I need to change something. I cannot rely on the university. So, I started to broadcast on AM Radio! (…) Because the people who listen to AM Radio are older… It is a cultural radio in the city, very traditional. And the ones who listen are all old persons! Young persons don't even know what is AM Radio! (…) I needed to attract people from the city… the madam who is undergoing medical exams… the woman who is going to shop at the supermarket… So, the people from the city! (Interviewee A)

To use the radio to reach different customer segments is a manner that this manager found to adjust the platform identity with its customers – another brand action. As mentioned by Schor (2017), sharing platforms reduce the transaction costs in which technology combines with users to remake economic relationships. Thus, even though this business model is attractive for the passenger who ends up becoming a user due to the price of the trip (as Interviewee L, M and N reported), some managers do not like this as can be seen in the quotes below.

> Man, unfortunately, what attracts more today it's the price. Price! It doesn't matter how good the service is, man, there are few persons that evaluate that. (…) People need to evaluate other factors! It is not only the price! I'll not raise my price because my drivers are the best, are well suited, because the cars are clean… This is something that I won't [do]… I choose that because it is more comfortable, right? (Interviewee F)

> Our fare is R$ 8.00! (He was extremely proud of that) We are the first in the city to stablish this price! (…) Well, is on that point that we attract more passengers, right? (…) Our biggest rival here, the bigger in the city, charge R$ 10.00! It's R$ 2.00 of the difference! For someone who uses 2, 3 times a day, it helps a lot, right?! (Interviewee D)

> You go out to the supermarket to buy something and… you'll pay R$1.50 or R$1.20? You'll buy the cheaper! And [only] after that you look for quality… (Interviewee C)

Thus, considering the statements above and the growth of this business model, it can be inferred the type of service that attracts passengers. Normally, as interviewees K, L, M, and N reported, riders appreciate low costs, convenience, and the ease that the platforms bring (SCHOR, 2017). In the following topic, it will be presented how the platforms combine a driver with a passenger.

4.2.2 Match

When a passenger calls a ride using the app, the platform must assign a driver to do the ride. To do so, the platform offers the ride to a certain number of drivers near the passenger. The manager set how many drivers will receive this call in a determined radius (in kilometers) from the passenger. This setting varies from company to company.

> The manager sets: ahm, I want a radius of 3km. Ahm, I want a radius of 1km… So, it depends on how many drivers he has, right? If he has a lot of drivers, he'll choose a shorter radius, right? Because if he chose a 2km radius he'll take too many drivers… (Interviewee F)

Also, there are different mechanisms to decide which driver will take the ride. In this research, it was found 3 mechanisms. They're called: contest (or auction), queue and

election. In the contest mechanism, the driver that accepts the ride first gets the ride (Interviewee D). The pros are that the passenger will know that someone is coming faster, avoiding the sensation of waiting for someone to get the ride, and consequently often giving up the ride in that app. However, in this mechanism, some drivers reported that they experience anxiety, tension, and stress due to the necessity to keep very closer to the phone waiting for a ride.

> During the evening I stay at the square! The square rocks at this time! But there is a lot of drivers there… So, you stay with your finger like that (he was holding his cellphone with the fingers not only very close to the screen but also exactly on the position to accept the ride in order to ensure that he'll be the first to get the ride) (Interviewee H)

> The contest is inhuman, man! The guy stays inside the car like this (he holds his cellphone and keep looking at it closely, full of expectancy). You're talking and then, the driver is here, ready to accept, right when it rings, to take the ride, man!! (He said extremely anxious). So, I do not like it. I used to work like that on (he said the name of the company), and I was… dude, how can these guys be so fast? My cellphone barely rang and man, I was sweeping [the finger to accept] and he (another driver) had already got… (…) And then you start to promote a feeling of… how can I say… injustice! Because it will vary… if your phone is new, and it has a fast chipset you'll get the rides faster because the ride will arrive for you faster. Because the phone has to activate the software, and the software has to go up on the screen… And this time for… from my cellphone to yours, it will make a difference! (Interviewee F)

In addition, Interviewee H was seen in a computer supply store asking if he could receive and accept rides on a certain model of a smart watch. From that, it can be seen that drivers who are subject to this mechanism are in a situation of so much desperation for a ride that they strive enormously to get a ride. On the other hand, this mechanism does not consider the time to arrive where the passenger is located. So, even though the manager can set a radius, the farthest driver within this radius can accept first. Thus, it might take longer for the driver to get the passenger, and also, he will consume more fuel.

> Yeah, you have to stay tuned! But this [mechanism] is kinda complicated… because… It rings… I'll accept. And sometimes… I won! I was faster! (he claims joyfully) But Zé (a fictitious driver) lost, and he was closer to the passenger… I'm far away… So, I'll take more time to get to the passenger… and it takes the passenger's time… (Interviewee G).

Considering this, moving on to the next mechanism, the queue, Interviewee G reported that he used this scheme on his platform. In addition, at that time, he did this work manually.

> We start the day and the driver used to send me a simple message: 'Hey, put me on[line]!' I had a computer, I put his name on the queue. So, there was João, Pedro (fictitious drivers)… I used to make a queue of drivers. And then I receive a ride, and then João goes. Then, another ride, Pedro goes. Then João comes back and I put João back in the queue again. (…) But… you (passenger) are here at the university. João could be here, right next to you. Well, there's a ride here at the university! Great! However, Pedro is at Colina da Serra. If it was his turn, he would come to the university… And, perhaps, João was right next to you! Well… this is not fair! But it was all on me, a normal person… So, I, in my home, I had to use a board, put the map of Lavras (he was saying while drawing in the air) and keep updating… 'hey you, where are you?' Ah, ok, you are at the university… let me see… (…) Where are you, exactly? [laughts] It works… but try to do that at a rodeo party… it was around 200 rides during the night… (Interviewee G)

So, from that, it can be seen that the queue mechanism has some drawbacks. The decision of which driver will get the passenger does not take into account the distance between the driver and the passenger. Thus, certainly, the queue mechanism is not the most effective since the passenger will probably not be served by the closest driver. And, for the driver, he will not get the closer passenger, consuming more time and fuel to get to the passenger. A good point on this mechanism regards the justice feeling since a homogeneous distribution of rides per driver will be achieved.

On the other hand, the election mechanism puts another variable to be discussed with all the mechanisms: the security.

> In the election, there is something called safety. Because you look [the address], the passenger is here and wants to go there? At this time? No, it can't be… really? I take it or leave it? (he simulates his thoughts) (…) So you can evaluate: hum, I'll not take it, man! But when you don't have this time, you must accept the ride! Well, but one might say: 'after that, you have time to cancel!' Yeah, you have 2 minutes to cancel and [the app will] redirect to another driver without the need of the passenger to call again. But before that, the passenger already saw who was going to take him… I've already come down to a place for a ride and then the girl said: 'it is you? Because the app said…' and then you have to explain… and the person still afraid… (Interviewee F)

In addition, this mechanism considers the time that a driver will take to get a passenger and it shows the results to the drivers that accepted the ride. Therefore, drivers have a feeling of transparency.

> I'm sure that the drivers prefer [the election mechanism], right? Well, everyone says so! Because we can get the nearest ride… The contest disturbs you! The passenger is right at my side and then another driver gets it? Why? Now that I was going to make some money? (because he'll not drive much to take the passenger) (…) In the election scheme, you might not take the ride… but you at least know that you lost this ride because the other driver was really closer. (…) (when I asked how

> did you know why you lost the ride, he answered explaining the mechanism) The cellphone of the nearest drivers rang. I chose to take the 2 nearest drivers. They can accept or decline. If he accepts and the other also accepts, the app says: choosing the best driver. Because, at this time, it calculates who is nearest to the passenger. (…) It calculates considering the time to arrive at the passenger. This is not even made by kilometers; it is by time! Because one might be nearest (in means of distance) from the passenger… but for this driver to get there, it is worst (due to traffic, for example). So,, Google [Maps] returns to the app the time that will take for both drivers and it gives the ride for the one who'll be faster to get the passenger. (Interviewee F)

However, there are some drawbacks to the election mechanism. It regards the time of a driver to accept a ride and the experience that the passenger will have while using the app because he will wait more time to see that someone accepted the ride. In an inner city, it makes a difference since it is common the feeling that a certain app does not work in the city. Unfortunately, this is also due to the disengagement of some drivers. Interviewee I and G reported the same experience:

> (manager's name) had to put the contest mechanism because it was having a lot of call evasion; drivers were not taking the ride. He (the manager) doesn't like it, himself doesn't like it… then it started to put some pressure on the drivers… (Interviewee I)

> (…) However, it's not all drivers that want to work… Because, sometimes, he is online but he's doing other stuff. He's playing a videogame, do you remember what I said? 'I'm playing football… there are just 5 minutes left to end this match… Awn, man… does it have to ring now? At this time that I'm making a crossing to the area, it's tied… Ah, man… I'll make a ride later!' (he simulates the thoughts of certain drivers and the hits the table). It is a commitment!! (Interviewee G)

Thus, the election mechanism asks drivers more committed to the platform. In general Figure 15 summarizes the overall pros and cons of each mechanism. The green cells demonstrate the good aspects for each variable; the red cells a bad aspect and in orange the impartial.

Figure 15 – Matching mechanisms of a local mobility platform

Variables	Mechanisms		
	Contest	Queue	Election
Anxiety level	High	Low	Medium
Safety	Low	Low	High
The feeling of fairness and transparency	Low	Medium	High
The necessity of a driver's commitment	Low	Low	High
Time to inform the passenger that someone is coming	Low	Low	High
Time to get the passenger	Medium	High	Low
Costs for the driver (fuel consumption)	Medium	High	Low

Source: Prepared by the author based on research data

With respect to the anxiety levels, it is clearer that the contest mechanism provides the worst experience for the driver. In the queue mechanism, the driver knows that his time will arrive and there is nothing else he can do but wait his turn. On the other hand, the election mechanism provides a medium level because the driver still needs to know where is the best location to wait for a ride. For safety, both contest and queue share the same risks, since the driver does not know where he will. On both mechanisms, you can still cancel but it costs passenger's trust. In the election mechanism, you have time to evaluate and accept or decline, saving the driver any preoccupation regarding safety.

Following on the same table, the feeling of fairness and transparency are different for all mechanisms. While in this scheme the driver feels harmed because of the need to accept fast, in queue mechanism the driver which is closer to the passenger might dislike if another driver, come far away to take him. On the other hand, in the election scheme, the platform ensures that the closer driver will get the ride, making the driver understand and comprehend the decision easily.

For the necessity of the driver's commitment, the manager that intends to use election schema must attract the right drivers to his platform in order to give a response to the passenger as soon as possible. On the other hand, in contest and queue, the commitment of the drivers is not requested so much. That is because in the contest the drivers indeed compete for a ride, and for the queue, if the first drive opts to not go, there is another driver waiting.

The time to inform that the passenger is coming for contest and queue are practically the same since that as long as the ride is accepted by any driver. However, in

the election, there are some drawbacks that may affect passenger UX. Differently, the time to get to the passenger is medium for the contest is medium since the driver is closer by at least X kilometers. While in the queue, the driver might come from the other side of the city. Contrarily, in the election, the passenger is ensured that the closer driver will get him.

Finally, for the costs for the driver to get to the passenger, it follows the same reasoning of the variable time to get the passenger.

For the passengers, unfortunately, only Interviewee M reported that she wanted to have asked a driver privately, however she was not able because this particular driver was on vacation. When asked about the motivations for doing that, she reported “Ah, [I called her] because she is a woman! And I was so delighted when… oh my! There’s a woman driver here! It is so more safer (sic.), even though nothing happened to me…”. On the other hand, Interviewees L and M reported that Uber and 99 do not have the option to favorite a driver which they really enjoy because they can ride with a driver that they liked again.

4.2.3 Connect

For this function it is important to highlight that it comprises the exchange of additional information between the players involved; the required data to make the value transaction possible has already been exchanged. However, there is some additional information that helps and facilitates both sides of the platform to transact value between them (REILLIER; REILLIER, 2017). Thus, this category explored this additional information. The core characteristics of this function follow in Table 13.

Table 13 – Characteristics of the Attract function in Local Mobility Platforms

Function	Strategies	Interviewees' Quote
Connect	- Importance of the chats with the passengers; - Usage of the luminous sign or stickers; - The luminous sign improves considerably the recognition of the car and also configure a brand action since it draws attention of riders and potential riders.	- "... I lost several rides that you arrived at the passenger location but you don't see him – and it wasn't possible to call him, I hadn't a way to communicate with him" (Interviewee G)

Source: Prepared by the author

On well-established mobility platforms, the transaction between the two parties is intermediated by a specific company that, in general, uses sophisticated algorithms for creating results that facilitate the matching of drivers and passengers (CONSTANTINOU; MARTON; TUUNAINMEN, 2017). A similar system is used for the platforms that were part of this research. However, as the study shows, there are several specificities and limitations when it comes to local mobility platforms. First, the experience of Interviewee G when he did the job to connect both sides of the market without an application gives a dimension of the importance of this function.

> The only information that I had was the car and the name of the driver, right? (…) I had no communication between the driver and the passenger. And it makes all the difference. (…) Normally the address was via GPS (Global Positioning System), and you know that this is kinda flawed. It is. The GPS itself recognizes it and says that this is an approximate location from 100 to 200 meters. But 100 to 200 meters you can get into a street or another. So, I lost several rides that you arrived at the passenger location but you don't see him – and it wasn't possible to call him, I hadn't a way to communicate with him. So, I used to drive around the block until the passenger cancel; it is a tremendous loss. It was by the end of 2017. (…) I had a lot of problems with the drivers regarding that and sometimes he doesn't have patience and they used to tell me: 'man, I have honked and nobody comes!!' 'Ok, I will find the passenger!' (the interviewee answered the driver that he managed). Then I sent a message to you (the passenger) and you are talking… you'll not look… and the driver is waiting: 'come on bro! where is the passenger?!' and at that time I was 'keep calm…' you've to use a psychology [laughts]. Then, I called the passenger and they answered me: ah, it took too long and I left… (Interviewee G)

Thus, it is clear that the chat inside the app makes the value transaction easier. It is considered extremely important as Interviewee H, and even essential as Interviewee I pointed out. Another element that helps to identify the cars are stickers, and a luminous LED sign that is attached to the windshield of the car using suction cups. A similar device is used by Uber in big cities and is called Uber Beacon – it is shown in Figure 16.

Figure 16 – Uber Beacon in orange color

Source: (UBER, 2016)

The device used by these companies has only one color but its contribution in the connect function is significative according to the interviewees:

> We have the led sign! It works using led! So, it becomes easier for the rider to identify… sometimes he doesn't know the car… so he sees the luminous sign and he just asks the name and he gets in the car (Interviewee I)

> You see the led sign far away and: 'oh, the car coming!' There are some women that don't understand anything about cars… she doesn't know the model… and, what is the solution for her? She looks at the car's color, but… in the evening… well, she can look at the license plate! [laughts] (…) The led sign draws attention! I remember when (the manager) gave us the led sign… our app wasn't online yet, but I'll put on my car, I'll light it up now!! (He said extremely excited) In the evening, I was near the university, passing through the pubs and everybody was looking at it! And they're looking… what is that blue light in the car? Why does that car have this? It draws attention! (Interviewee G)

According to what the Interviewee G stated, it is noteworthy to highlight that the luminous sign also present a brand action drawing attention of the riders and possible riders to the feature in the car. Interviewees C and H also mentioned the importance of that element on the car, but as they use a simple sticker on the windshield, it was not observed considerable visual impact as the luminous sign.

> [the luminous sign] is a differential from (the manager), because nowadays the (rival company) has a sign… but their sign is a paper glued in the windshield… and in the evening… (he makes signs using his hands implying that no one will see that) You see nothing! (Interviewee G)

This sticker was mentioned as a feature of trust, which this dissertation will explore further. In addition, it can be seen the luminous sign and sticker are elements that put the brand in evidence since they are made to make the car recognizable as Interviewee M reported.

4.2.4 Transact

During the value transaction (the ride), to foster elements that promote a good relationship between the drivers and the passengers is crucial. In general, the characteristics that this function present follows in Table 14.

Table 14 – Characteristics of the Transact function in Local Mobility Platforms

Function	Strategies	Brand Strategies
Transact	- Foster a good relationship between drivers and passengers; - Control the number of drivers to create deeper communication and relationship;	- Passengers have a high probability of getting the same driver on the next ride; - To have the name of the city in the company name;

Source: Prepared by the author

Due to the fact that the app operates in small cities, it is very common for a driver to take the same rider more than once. Regarding this Interviewee I stated:

> If he (the passenger) trust, since the city is small, and he thinks that the drivers are really cool, I think that he doesn't look anything else. He became loyal to the platform. It's not like a big city with Uber and 99 that he looks at which one has a lower price! Because here, you have a

> chance to take the same passenger 5, 6 times… almost every ride with the same passenger, you know? And sometimes it turns that he (the passenger) knows all drivers, right?

Interviewee H corroborates with this speech when he described a case that the same passenger uses to call him in the app since when the app started. He said that one of the first times that this passenger called, she was pregnant. Nowadays her daughter grew and he tells joyfully that he followed her from before his birth until today. Thus, it is clear that the passenger and the driver creates a relationship, even though passengers call drivers in the app. This is also shown by the passengers' speech: Interviewee M, for instance, reported that: "I think that no Uber driver was memorable… (company name) I know them! From Uber, I got one this time, but… none of them kept on my head, you know?"

Therefore, all the interviewees reported that he acts as a psychology professional hearing and even advising passengers about their lifes.

> You are a psychologist! There are so many stories in that car… you wouldn't believe it! That car knows a lot of thins! Betrayal… people making out with someone… everything that you want! [laughts] (Interviewee G)

> We are psychologists… I already got a passenger that sat on the rear seats saying: Today I'll go on the rear seats… Why? Because today I need to cry! [laughts] (interviewee F)

> We are psychologists!! One of these days I asked (the manager)… How long does it take for me to get my psychologist's diploma? Dude, people tell you about their life!! … fought with her husband, with her girlfriend… they start to cry… Everything! Cases of life… love… hate! [laughts] Ah, I'm pissed off with what my cousin did… or… Oh, I love my husband… (…) and they ask our opinion! What would you do? And I do love this proximity! (Interviewee H said extremely excited)

In the same content of the speeches above, Interviewee I reported that the relationship created is not something that personal, but the strong enough to hold a conversation when they occasionally meet on the street. In addition, brand strategies are also responsible for providing this feeling of proximity. The speech of the Interviewee L explains that:

> It seems that Uber is something… colder (frigid), you know? Well, Uber works fine! But is a distant app! (I asked why does he think that) Because it seems to be something business oriented… it's not something… well… the usability is very good… but the fact that you know the man (the manager) behind the app, just makes it closer! And (the company name) is (he says the company name emphasizing the name of the city which is part of the company name). So, it has the name of the city and you feel cozy. But Uber… it was something like a local soda and Coca-Cola. Coca-Cola is good… but it is distant… but a

> regional brand from here is regional! It looks like something that came from where you are! (Interviewee L)

This same Interviewee L also reported that he would even give a tip for the closer drivers because they treat him very well – he missed the option of giving a tip on the platform that he uses. Therefore, it can be concluded that for some passengers, they will certainly pay more for differentiated mobility services. Thus, this proximity between drivers and passengers influence on the passenger choice of which app he will choose.

> Yeah, app drivers are psychologists! (I asked him if that makes a difference for the passenger in choosing one app instead of other) Helps! And I think it helps a lot! And it influences on the app because I can be a driver of (company A) or (company B) or any app… The person will like the driver, not the app! The app comes second! But if I call (company A) it's because that guy is cool! Or, I will call (company A) because I favorited him, so I only use that app! (…) (Interviewee H)

This proximity is also evident when the passenger asks the driver a favor, or to do something that goes beyond his actual function which is to drive. The interviewee I reported that he had to carry shop bags for a passenger, and even to enter the passenger's house to check if a robber was there. Interviewee G also reported a similar action:

> For example, a certain mom, with an adolescent daughter, they seemed to have sort of 14 years, and the mother 39… the mother was drunk and the daughter was completely sober, but she (the mother) hasn't any conditions to get out of the car. So, I had to stop the car, and help her (the daughter) to put her (the mother) inside her home, carrying her… Am I obliged to? No! But it's something that you might come across. In a bigger city, I don't know if someone would do that… Perhaps I'd get her out of my car, and let her on the sidewalk, and bye… go for the next ride…

On the other hand, Interviewee N, which does not like to talk with the driver, reported that she does not create a closer relationship with the driver, even though she believes that she did not request many rides to create this bond.

So, in general, as the interviewees related, the rider and the passenger have a close relationship. To control the number of drivers within the platform, as this dissertation will further explain, allows drivers and passengers to create deeper communication and relationship, which builds customer loyalty and then, strategic defenses for the platform.

4.2.5 Driver Management

Considering the hate discourse that many drivers have upon big platforms, the local platforms the managers strive to create an environment with good benefits for the drivers. This positioning is very clear considering the characteristic of this function as it follows on Table 15.

Table 15 – Characteristics of the Driver Management in Local Mobility Platforms

Function	Strategies	Brand Strategies
Driver Management	- Create a good environment with benefits for the drivers; - Give luminous sign, water, candies, thermic bag; - Healthcare plans, discount on stores and clubs, headquarters; - Control the number of drivers to ensure that all drivers earn money; - Proximity between driver and manager - Create strong benefits to create a feeling of loyalty of a driver with that platform	- Passengers reported that the objects inside the cars makes the brand feels more established - Make part of platform X gives a prominent position, or status;

Source: Prepared by the author

Therefore, the interviewees, on the whole, made that clearer in several points of the interview: "… what I really want is the satisfaction of my drivers! … My attractive is to charge less of the drivers!" (Interviewee E); "We give benefits for the drivers… including the low taxes, we give a bonus of R$100.00 for the driver that makes the most rides…" (Interviewee C)

> (When I asked why he likes so much about the company that he drives for, he answered me) Because it gives you a very good work environment, right? I believe that… because there are a lot of people in the app that you see that he came out of other apps and he is 100% (company name), you know? The drivers defend way more (company name). Works much more for (company name) (…) any company that values their basic employees, it will make them much happier and then they have a greater return (…) make the drivers happy consequently, the passenger will be also happier because he'll treat the passenger with professionalism… (Interviewee I)

> All of my drivers, when they join the app, I give them the luminous sign, water, candies, and a thermic bag, you got it? (…) the luminous sign it lights in blue for the male drivers and in pink for the women ones (…) our bag has water, candies, paper tissue, hand sanitizer (…) (Interviewee F)

> … the headquarters (this is the only company interviewed that has headquarters) it's incredible, dude!! Because we have drivers that stay awake all night long and sometimes they don't have a bathroom everywhere is closed… or he wants to have a break or a coffee and [everything is closed]… So, he (the manager) the headquarters available with a couch to lay down, take a nap… this is extremely important! He (the manager) has no obligation on doing that. He does that think at our convenience… (…) there are some drivers from Pedrões, for example, that use a lot… it makes the whole difference in their life! (Interviewee H)

With respect to the brand, it can be seen that the objects given by Interviewee F were well-noticed by the passengers L and M. The passengers reported that it established the brand: "it seems that (company's name) is a brand already well stablished in the market. The luminous sign, the bag with water and tissue…"

According to the interviewees, it is clear that they seek to provide much value to the driver if compared to big platforms. In addition, the managers seek partnerships with other companies seeking to promote a better job and life quality for the drivers.

> We have the card named summer project which gives you a 50% discount to join a club (…) we also subscribe to the drivers in a health plan… the (he said the health plan name) here in São João del Rei with 20% discount (…) we don't have employment bond, but we look for a partnership to benefit the drivers (Interviewee D)

> They guy over there has an oil change! He does that for R$ 20.00. I tell him: let's make a deal? Every bike that came here with this sticker you do that for R$ 15.00? I give you a volume (he meant demand)! (Interviewee B)

> … I already knew him (one the owner of the gas station that he become a partner) and I went there and explained that we have a fleet of more than 30 cars… could you please give us a discount? (…) they did! (…) So, they have a register of the vehicle's license plate the driver document. We have a register we put our password (…) every driver that joins the platform I call them and ask them to add him (Interviewee F)

The benefit offered by some platforms is such that some drivers even feel embarrassed if they work for another platform. This is evidenced in the speech of Interviewee I as he mentioned that he and others drivers work more for a certain company – as Interviewee M already noticed. It becomes even clearer in the sentence of another driver:

> When I was traveling at that time, I asked him (the platform manager) permission [to drive for Uber and 99]… Well, let me tell you (he simulated his talk with the platform manager)… and he was, 'no, please! For God's sake, go work… (insinuating that he don't have to ask permission to work for another platform)… and then I told him: 'hey, no, I've come here to tell you that because I think it would piss

> you off and [this is not fair to you]… you spent a lot of money on that… money that could be in your home… and it's an operational cost wrong… and you must have a return on that… (Interviewee G)

On the other hand, some managers ask the drivers exclusivity to work only on that platform. Interviewee A argues that it is fair to ask them to work only for him because he will not add more drivers to the app. Also, he claims that it is not fair to let the drivers use the app headquarters if he works for another app. Another manager also asks the driver must work only for his app and he does that using a contract (INTERVIEWEE D). However, a driver reported that the exclusivity benefit is not working well on the platform that he works.

> One thing that is pissing me off on (company) is that! He (the manager) is putting a lot of drivers… (…) You look [at the WhatsApp group] and he is like: 'welcome Fulano (a fictitious driver)! Welcome, Fulano! Welcome, Fulano!' The demand increased, that's right! But if I could give him a piece of advice, which I already gave him, it would be more selective regarding the time (he wanted the manager to weight more the time that a driver will be available for the app) (Interviewee H)

This result shows that the platform which Interviewee H works miss the equilibria stated by Choudary (2015). It is important to highlight that the company in which this interviewee H works foster a culture that states that to work on that platform is a prominent position or status. On the other hand, some managers claim that to ask exclusivity it is something illegal (Interviewees C and F) and also, is not fair with the driver.

> … I cannot ensure that if he stays online here, you'll get 20 rides today. (…) I just need to understand that the driver needs to work, man! And he works with whoever he wants! (…) I just have a tool that helps him to work! I'll help him and he helps me. (…) My motivation [to have this platform] is the drivers that have children… we care about them! (Interviewee F)

Even though Interviewee F does not ask that the driver work exclusively for him, he wants their drivers not to miss a ride in his app.

> You can work for another platform if you want. But if I see you, everytime that it rings, I know that you were there, but you didn't accept because you were in another ride, you'll be someone who is not being useful for the app… But not because you work on several platforms. It's because you cannot meet the demand… got it? (Interviewee F)

Thus, in general, considering the number of passengers and drivers, the platform manager must find a balance between them in order to do not demotivate the drivers (Interviewee A, C, D, E, and F). It becomes clearer when Interviewee E states: "how can

I put 50 drivers in a city of 100 thousand habitants? I cannot do that! The driver will be demotivated with my app!"

It is worth noting that the need of controlling the number of passengers and drivers does not have the objective of equalizing the supply and demand since the pricing mechanism of those platforms does not consider the number of drivers and passengers online in the platform as we will further explain on Payment section; the platforms in inner cities normally does not work with dynamic pricing[4] as Uber does.

They intend to control this number in order to ensure that all the drivers work and earn money. So, if the manager puts too many drivers in the platform, the profit per driver will be extremely low demotivating and making them quit the platform: "The app goal is not to put a lot of drivers… the goal is the ones who are in the app meet the number of customers that we have" (Interviewee D).

On the other hand, if there are many passengers and a few drivers, they will lose rides, which is not good for the platform because people may understand that the app does not work. This is the reason why a manager reported that he rather not invest in publicity afraid of not being able to meet the demand.

> The other app came, got 3 drivers and distributed 5 thousand flyers. Everybody downloads his app because he says that he has a good price. But when someone calls, nobody answers (because all drivers are occupied). (…) In my app, in 5 minutes the driver is at you. My app works! I embraced so much this reasoning that when I started my slogan at Facebook was: "the app that works!". People say: make publicity! Then I say dude, I'll not make publicity that I'll not be able to meet, so I make publicity according to the number of drivers that I have. It is slow! (Interviewee A)

Briefly, the strategy of this manager is to balance the attract function with the objectives of the app, which in this case, is to give good conditions of work to the driver – few numbers of drivers to allow them to make more profit asks for smaller publicity. Still, a driver from the same platform argues that they should do more publicity.

> (manager) bets on that! (he said that when I asked if drivers attract more passengers than the app itself) Not only social media! I mean radio, flyers, etc.! We don't have that… (…) I know that it's important to focus on service quality! But if the rival… publicity has equal importance! (He recognizes that the rival company also has good service quality) (Interviewee H)

4 "Dynamic Pricing takes effect when a lot of people in the same area are requesting rides at the same time. This means that rides will be more expensive. Adjusting the price attracts more driver-partners to an area so everyone can get a ride" (UBER, 2020)

The possibility to give advice to the manager leads to another important factor in the Service Provider (driver) management which is the proximity of the driver and manager. The Interviewees A, H, F, I and G reported in their companies the manager has a WhatsApp group with all the drivers. Corroborating, Interviewee A and G explain that in the local platforms, more than the WhatsApp group, the possibility to physically talk to the managers is very important:

> … this is when I tell you that proximity makes the difference (he was claiming that some companies do not pay attention to the necessity of changing the pricing). If I know where he lives (the manager) I will knock his door and, c'mon, my friend, let's improve that, that… let's change! But with WhatsApp groups, you send a message to him (the manager)… it takes time to get an answer… he reads your message… and he'll answer you when he wants… (Interviewee G)

> … the people know where I live… they come here upstairs, they enter [in this room], sit here and talk to me, you know? This is the difference… small cities must have that! If I don't have this contact with the person, and the person doesn't know who am I… (he makes a gesture indicating that something will not work) (Interviewee A)

In addition, this proximity mixed with the low number of drivers allows the managers to communicate easier. Considering this, the Interviewee F and A informed that he uses the WhatsApp group to build relations with the drivers. Interviewee A explained that he records two-minutes-videos every day giving tips and reminding the drivers of the good practices. Interviewee F clarifies that he uses the WhatsApp group to pass on safety information regarding rides and passengers. Also using this group Interviewee F shares daily the price of the services offered by his partners exclusively to the drivers of his platform. The drivers reported their thoughts about that:

> I really like (company name)! We are a family, really! In our WhatsApp group, they play and make jokes (he said feeling happy with that). But when we need to talk seriously, we also talk! Everybody works and we deeply respect each other. The work environment is really good! (Interviewee H)

On the other hand, Interviewee G explained that he doesn't like it "because people put so much personal stuff there! A lot of unnecessary comments!" Then, he argues that by saying that he has already got a ride that he should not have accepted because his safety was at risk. He discovered later that the manager advised everybody using the group and instructed them to reject the ride. After that, the manager putted rules in the WhatsApp group.

In summary, the benefits provided by some platforms are much that the drivers do not want to go work on another platform.

> We had such difficulties trying to enter in Lavras, man! We entered… defined the number of drivers… we posted… nobody came, man, to work! We got 4 drivers… also, we've already given up from that city because of that! This is really weird! There were other apps that also went there but had the same difficulty! (…) We thought that it would be better than here in São João [del Rei]… but it wasn't… we had a very negative result there! (…) We stayed for 3 months, 3 months having problems looking for drivers and we got only 4. There is another app there that is more than a year there… I think they have only 13 drivers… (he was mentioning the app from Interviewee A – at that time, Interviewee F did not create his company yet and was driving for other companies in the city) (Interviewee D)

Even though Interviewee D tried to enter in Lavras but only a few drivers joined his app, the two drivers Interviewed (I and G) reported that they knew that this company was recruiting. However, it did not offer enough value to make them join their platform. In addition, Interviewee F (who also knew that this company was trying to enter in the market) and the aforementioned drivers suggests that the fact of not getting many drivers was one of the reasons that made them give up.

Finally, Interviewee E summarizes this topic stating confidently:

> (…) Uber is a dumb company! Extremely dumb, thank God! We are small but we're quite clever! Uber has media but it doesn't give the proper conditions for the driver to work, isn't that true? Well, if Uber has a strategy, I have mine. I can face Uber or 99 properly wherever they are, you got it?! My idea is to take this platform to the inner cities where the service does not exist. We think that way by now.

4.2.6 Trust

With respect to the enabler trust, managers, in general, informed that what makes passengers trust in the platform regards a good selection of the drivers. Table 16 shows the main characteristics of this enabler.

Table 16 – Characteristics of the Trust enabler in Local Mobility Platforms

Enabler	Strategies	Brand Strategies
Trust	- Good selection of the drivers; - Professional treat elements such as - Well-dressed, hair cut, shaved, wear snickers; - Receptive and pleasant behavior, - Have water, candies; - Have the car clean, and with a good smell; - Objects with the company logo - Managers must be someone trustable for the drivers - Make the business close to known families in the city.	-The personalized items such as the luminous sign or stickers creates the platform identity which brings more trust to the passenger;

Source: Prepared by the author

Thus, the interviewees that are managers of the platforms reported that to do so, they strive to cautiously select the driver that will join the platform – as previously mentioned on the attract function.

> (When I asked the interviewee how he established trust in the platform he answered me) I think that well selected drivers, man. The driver profile is something elemental on that. This is the drivers' achievement because they carry the passengers. (…) During the interview, if I see a potential driver that appears to be a playboy, I will probably not accept him on (company)… Because I don't wanna my drivers' flattering passengers around! I even joke with my drivers saying that they're all ugly! The first requirement to join (company) is to be ugly! [laughs] (Interviewee A)

> We keep always posting on the internet that our app is regulated in the city, and the drivers pass through an analysis… that we ask a criminal records check… and we always post that we have a support center and they're free to call us anytime… it brings trust, right? (Interviewee D)

Interviewee L and M reported that they already got rides which the person who was driving told them that he is the manager and select the drivers to work on his platform with caution – this shows that the intuit of selectin drivers is also thinking on the platform brand. On the other hand, some drivers stated that what brings trust to the passengers are

elements that demonstrate a professional treatment. So, to be well-dressed, have water candies, a car clean, and objects with the company logo corroborates to establish trust.

> I think that to use a uniform, shirts bring trust! And, when you come to take a passenger and the driver got his hair cut, shaved, the car is smelling good, wearing a uniform, it creates an identity! It will bring that impact of things that serves you right! (…) Also, I think that if we used formal shirts would fit even better because it brings a more professional air… (Interviewee H)

> … we need to work with professionalism, right? We praise the excellence… and it comes to the driver's behavior, his clothes, showered… keep the car clean and equipped with water, candies, tissue… the luminous sign… (Interviewee I)

> (…) the luminous sign it lights in blue for the male drivers and in pink for the women… well, we tried to personalize because it brings advertising and safety. If you see the sign, you'll know that this is a car of ours! (…) Discerning passengers praise this, you know? (Interviewee F)

With respect to the feeling of trust, Interviewee L, M and N reported three aspects on that: (i) the appearance of the driver: his hair must be cut, shaved, wearing snickers and not barefoot nor wearing flip flops; with respect to the uniforms the interviewees were impartial; (ii) the drivers' behavior which must be receptive and pleasant; Interviewee L and M reported that to talk provoke a trustworthy feeling, even though Interviewee N did not like to talk while commuting; (iii) the car: they reported that older cars and two-door cars make them feel uncomfortable being important to keep the car clean. In addition to that, Interviewee M reported that the car's power influence on her perception, since she lives in a hilly city. Interviewees L and M reported that to have the car supplied with water, candies, tissue, and the luminous sign was considered as a plus which provokes the feeling of professionalism.

Notwithstanding, a manager reported that as a characteristic of small and inner cities, a local business becomes trustworthy when they belong to a very known family in the city or have a relationship with them.

> Here, Lavras is a family city, man (…) You go to a pub of 40 years, but a brand-new pub with very cool stuff it closes, you got it? So, it seems that the city privileges the ones they know. (…) So, this is why I got so many things here, you see? They say: I'll go with you because I know you! They don't go due to service excellence! They go with you because they know you! (…) and I believe that this is a characteristic of inner cities! (Interviewee F)

> Small cities must have that (proximity – he was talking about the importance of being closer to the driver, but the conversation leads to trust)! If I don't have this contact with the person, and the person doesn't know who I am… And you are… (he started to simulate a

> conversation by acting someone who wants to know who the interviewee A is) I live down the street! Oh, really? Who is your father? Ah, my father is (name)! Oh, man!! (he hits the table) I know him! Look what we got…(he acted a surprise face because he became trustable since they know who his father is) You are the manager? Yeah, it's me! And what is that (the platform)? That's very cool! I'll help you! I'll promote you! (…) So, it's very personal! And the guy from Divinópolis doesn't have that… the one from Campo Belo neither… Uber, from the United States, doesn't have that! So, I believe that this is the secret here! (Interviewee A)

The trust between drivers and managers became evident when Interviewee F explained that when he was a driver in other companies in the city, he acted as a leader creating the WhatsApp group, seeking for partnerships with other companies such as gas stations and oil changes. So, Interviewee F became someone very trustable among the drivers. Thus, when he decided to start his company, he attracted drivers with ease as Interviewee I and G reported.

> There was nobody leading us… and people need that! It's something native from the human being. Then I created the WhatsApp group… I sought partnerships when I discovered a party I communicated with them… so they saw me as a leader! Then, the drivers began to talk: hey let's talk to (the platform manager that he used to work) to put (Interviewee F) as a manager of Lavras because he does many things for us! (…) And then, when I became a driver in the other platform, the same thing happened, than the manager told me: Well, (Interviewee F), you are doing so many things for us, I will lower the taxes for you! Instead of 10, I will charge 5% per month! (…) And… I never though to start my platform, but I saw that I can do much more for the drivers and I saw many things that the driver missed… (Company name) forget the drivers… (another company name) miss publicity, he started to make because I joined the market (with my platform) (…) All the discounts that we have today it was me that achieved that… both for (company name) and us (his app), right? (…) In (another company name) they did nothing for us, right? (Interviewee F)

4.2.7 Governance

In general, the platform rules are very informal and negotiated when the drivers join the platform. Table 17 shows the characteristics of the enabler Governance in local mobility platforms.

Table 17 – Characteristics of the enabler Governance in Local Mobility Platforms

Enabler	Strategies	Interviewees Quote
Governance	- Informal and negotiated rules with the drivers; - There are not a specific set of rules that may cause a driver to be banned; - Some platforms did not follow the legislation requirements; - Passengers does not have the culture to use apps, so they must be taught how to use app.	- "It's kinda based on the perception whether the driver is having too many complains..."(Interviewee I) - "It's to teach him use the app" (Interviewee G)

Source: Prepared by the author

Normally the rules regarding the information leakage previously mentioned in attract function. The information leak contains the same value: the drivers' phone number. It opens the possibility to call a specific driver by dialing him of texting him, which asks the "door handle" function inside the platform.

The biggest issue in doing that comprises the feeling of unfairness by the drivers that managers strive to avoid, which may cause them to distrust the platform (Interviewee A and F). Secondly, "open the door handle" might put drivers on a risky situation – as previously explored on attract function. To work around this problem drivers and managers make an educational effort teaching the rider to call them inside the platform.

> (...) It's to teach him to use the app. I had some customers… old ones, that I forced them to enter the app. How? It is not the first one [that I did that]. I'm in my home, quietly, or on the streets, [I've] got no rides… Someone called me… hey, you! Please, call me on the app! I cannot get you now. Well, how long will you take it? Ahm... about 40 minutes… 50… An hour. But why all that? Ah, I will go to the supermarket and my wife wants me to wait. So, I'm quiet in my place… stopped. But why? Because it is better for him and for me. This is the way. (Interviewee G)

> I did a campaign to start this month to… it's an educational campaign! To educate the passenger… for safety purposes… so he calls in the app, and not in the personal [phone]. It is quite normal, in all of the cities, ah I know someone [I'll call (by dialing) him]! (…) I will work on that through flyers, social media, drivers… humm… all the tools possible! (Interviewee E)

> One of these days I got a passenger that on the app says how many rides he had done, and he had 6 rides. He was doing is seventh. And then I asked him… 'so, you are doing your seventh ride and so on… ah, he told me: ah really? No, I have much more than that! I'm sure! And I answered, no, you don't… the system shows me only 6 rides… No, I have more, I'm sure! Because there's a driver that I like him and I call (dialing) him, and I ask him!' … So… Did you get it? I hear that… And then, I tell him, 'so, please, try to use more the app, I give you discount coupon the more you use…' (Interviewee F)

Therefore, Interviewee A mentioned that he forbids drivers to give their phone number or contact card to the passengers.

> If a fellow of mine gives his personal card… a reason to ban from the app is that! (…) If you give your personal card to a passenger and this passenger starts to call you (not using the app), you're not pulling someone off from me; you're pulling someone off from the app and your coworkers also!! (He says that angry) This is unloyalty!! (Interviewee A)

In general, managers feel extremely uncomfortable while talking about the drivers that open the door handle or do rides out of the app. Interviewee D has a stricter policy stating that: "This is something that we do not accept! (He was angry) Ah, give a bad treatment, did rides out of the app… dirty cars… when this is reported we ban at the same time!".

On the other hand, Interviewee F recognizes that to open the door handle is a very useful function. However, it should be used in very specific situations.

> The door handle is [to be used] in an extreme case when the passenger is at some point and he says: 'hey man, are you Uber?' Which is something that everybody says… 'yeah, sure! Could you take me to that place and so forth… I'm late, man! Yeah, sure! How much? Well, I cannot tell you because the app calculates, but it might be around R$12.00… ok, no problem!' And then you open the door handle on that case! Because you won't ask the passenger to download the app and so on… It's not logical! So, the door handle is for that! But they don't do that… they answer the phone and says: ok, I'll get you there… (Interviewee F)

It is noteworthy to mention that as Interviewee I stated, there is not a specific set of rules that may cause a driver to be banned. No mechanism involving scores neither a flyer containing the basic rules.

> It's kinda based on the perception of whether the driver is having too many complains… but we don't have a number, like 3 complaints! (…) If something happens, I believe that (manager) would have a conversation with the person, and try to understand what is going on… (Interviewee I)

Other platforms stipulate a scoring mechanism. Interviewee E mentioned that a driver can have a maximum of three negative points.

> Yeah… so, when we receive the information, normally via social media, the driver is punished. He gets a warning; he gets a negative point. If he gets two negative points, he'll be paused for a while. If he gets a third [negative point], he is out of the company (Interviewee E)

However, the dos and not dos are not clearly stated in a document, which opens the possibility to ban a driver for doing something that he did not know that is illegal. For instance, the same Interviewee reported that he already dismissed a driver for suggesting too many improvements.

It is noteworthy mentioning that passengers, in general, do not understand what are the platform rules. Thus, all the passengers interviewed (K, L, M, and N) had no knowledge with respect to the open the door handle. Only L and M reported that they knew the requisites for the drivers to participate – which they knew while talking to a driver.

Following, the platforms are also immersed in a regulatory context. Considering this, Interviewee G reported that there are platforms that do not follow the legislation but the passenger does not know.

> Have you checked the vehicles of (company)? I've already seen a two-door car, cars older than 10 years for federal legislation and 8 years, according to the municipal legislation (In Lavras). So, we are talking about a car from 2009, 2010, right? Because we are turning [the year] already! No, 2012 for 8 years, right? I bet that this car is older than that. (…) So, when the regulations come, those from (Company) will drop by the half! (…) Also, the (manager) of (company) does not have paid activity on his driver's license. Only if he put it recently… (…) There are drivers… never got Uber… driving wearing flip flops or without them, wearing jerseys or tank tops… two-door cars… Oh, man!! C'mon! (…) put what the legislation asks! (Interviewee G)

Still, only Interviewee D, G, and F mentioned that to "open the door handle" is an illegal activity. Interviewee F explained that since it does not have origin either destination the transportation would be categorized as irregular passenger transportation. Thus, in a certain city, Interviewee G reported that the apps have 6 months to present an app that works properly. However, as many passengers do not understand the underlying legislation (Interviewee G), almost all the platforms interviewed presented irregularities. Also, many of these platforms used the speech of being regularized to promote trust to attract passengers.

4.2.8 Infrastructure

The infrastructure elements were most mentioned when the interviewee described the moment to accept a ride or not. In general, the interviewee reported the characteristics that follows Table 18.

Table 18 – Characteristics of the enabler Infrastructure in Local Mobility Platforms

Enabler	Strategies	Interviewees Quote
Infrastructure	- Important during the match function; - Infrastructure impact depends on the mechanism chosen in match function; - Matching mechanism should be clear enough for the drivers to evidence the infrastructure limitations avoiding a feeling of distrust; - Have the connect function working properly to allow drivers and passengers not rely on GPS - Infastructure elements raised: - Cellphone; - Internet and memory; - Driver's distance to antena.	- "Why my phone didn't ring?" (Interviewee A, F, H)

Source: Prepared by the author

Therefore, is important to highlight that the impact of the infrastructure on the app performance depends on the mechanism utilized on the match function. Hence, a contest schema asks for modern cellphones since any second during at that time counts.

> And then, what makes the most difference in that: A modern cellphone, with good internet and memory available, you got it? Your cellphone must always be without photos, videos, etc… as light as possible! It needs a strong memory, right? And a powerful processor! (…) Because

> sometimes the cellphone is ultra-slow… and the message comes… if another driver has a better phone, he takes the ride. (Interviewee H)
>
> … because it makes a difference if your phone is new and it has a faster chipset. Because it needs to trigger the software and the software has to pop out on the screen. And this time, from my phone to yours, it'll be different! (Interviewee F)

The fact that Interviewee H was seen in a computer supply shop also corroborates to the evidence that they try to find alternatives to be faster than other drivers. In addition, some interviewees reported that at some point they do not comprehend why a cellphone might delay beeping. They reported that they suspected that the manager or the app would be skewing a ride to a certain driver instead of other.

> [when I worked at] (Company) the (manager) always was the one who rides the most! Some people always… had the idea that… when I didn't understand how the app work, he does something to take those rides… and… if one or another he let the people take (…) Of course, he wouldn't do that! But I've already thought that at some point! (Interviewee F)
>
> Some drivers don't know and they say: 'why my phone didn't ring?' I often say ah, that's normal… I'm too lazy to explain to them that it's because the tower sends the signal! If we're here one next to another, my phone is here and the other is there, turned to this side, but still there, my phone would ring first! (Interviewee A)

However, as Interviewee A explained, there are more infrastructural elements beyond the softwares that influence on that. Interviewee E also mentioned that the internet is something that varies from a neighborhood to another. He reported that some passengers think that the problems they face are due to the app quality, but as Interviewee E claim, "no app is perfect! Actually, it could be perfect… but in the United States, London, France… but not in Brazil! We're way too far to have a good internet connection everywhere". Still, regarding the technological difficulties, drivers also reported problems regarding GPS.

> So, let's assume that you go using the address… you'll go on the top of the street… and you won't find the passenger… so you have to call… hey, fulano (a fictitious passenger name)… I'm the driver from (company)… I'm right here… 'no, no you are far away! My house is at the bottom of the street! Just keep going' (he simulates the passenger saying) Really? But your house number is 340! I'm here at 320! 'no no, but it's everything wrong! You can keep going straight forward all the way down the street!' So, due to that, I had to put the landmark mandatory when someone asks a ride (…) but people don't read, and they put 'right here', 'ok', 'space' 'dot'… Oh my God… (he says that making a face of despair…)" (Interviewee F)

Considering the difficulties with the GPS, from that it can be seen that the elements in the connect phase are important to ensure that the drivers and passengers are easily connected.

4.2.9 Improvements

This function asks for an open channel between the users (drivers and riders) with the managers, and from the manager to the developers. Relying on that, this enabler has the characteristics shown on Table 19.

Table 19 – Characteristics of the enabler Improvements in Local Mobility Platforms

Enabler	Strategies	Interviewees Quote
Improvements	- When using rented platforms, managers does not have access to statistical data of the transactions done – Actions have a managerial characteristic - Have na open channel between users (drivers and riders) with the managers, and from the manager to the developers; - Managers that are also a driver collect feedbacks directly from the riders; - To have a good transact and driver management function allow more proximity to get feedbacks; - To have a WhatsApp group and meetings;	- "... This platform is a little but limited, and there are several things that we cannot do because of that!" (Interviewee C) - "Do you think that theyy have access to Uber's board?" (Interviewee E)

Source: Prepared by the author

In general, all the interviewees that manage a platform reported that the drivers suggest improvements.

> Every time [they suggest improvements]! But only some drivers, right? Everything that they say I try to do. I explain what I can do to the very best I can. Guys, the app is ours. So, if you see something that you

> believe that we can make it better, let's try it out! I'm always trying to improve! (…) Every time that a passenger gets in the car, the first thing, after to greet him, that I do, is to ask him if he's enjoying the app. (Interviewee F)
>
> The driver suggests a lot! Many things I that I changed and adapted was due to them… (Interviewee A)
>
> (I asked if the suggestions are interesting for the manager and he answered) Yeah! There're several ideas, logically, that you can't make it, right? Implement, right? (…) Through the ratings, right? The passenger always rates the attendance, the driver… (Interviewee C)
>
> Yeah, we get feedbacks from the passenger and the driver! And we keep improving as much as we can, considering what the city, drivers and passenger needs… this is what makes us improve the app! (Interviewee D)

Interviewee L reported that the proximity between drivers and passengers, and also managers who are also drivers and passengers, facilitate the possibility to give feedbacks to them. Thus, he told a history of a moment in which he did not understand what he would need to write on a field that was obligatory to request a ride. He got disappointed with the app because of that and for him, this field had no sense. When the car arrived and he discovered that the driver is also the manager, he told him about the issue that he had, and on the next time he got a ride, his problem was solved: he was not obligated to write on that field because the manager removed that option from his software.

Also, some drivers report some actions done by the managers that propel improvements.

> This is the advantage when the manager is also a driver! He'll feel, right from the rider… (…) We have a WhatsApp group and we express ourselves there… And (the manager) use to do some meetings to discuss topics, improvements… He's going to schedule the next [meeting]… (…) This is something that he (the manager) miss as a driver… (Interviewee G)

On the other hand, a manager reported that those suggestions bother him and thus he rather to take the feedbacks on his own.

> (I asked: Do the drivers suggest improvements? How is that done? And he answered) Sure! Sure yes! Do you think that they have access to Uber's board? (he recognizes that the proximity to suggest improvements is important, however, he don't exploit that) You don't imagine how tough is that for me, my friend! Sometimes I say: hey you, my friend (referring to the driver) excuse me… you are knowing a lot, too much technical… build an app for you, but please! I've already dismissed drivers because of that! (…) Am I free today? Yes… I turn on my app and I'll follow my customers… I'll make rides, satisfaction [survey]… (Interviewee E)

Although the managers collect many improvements to be done, they report that they feel powerless because they rent the platform. In addition, they do not have access to the statistical data of the transactions done.

> Well, we use a system from another company, right? (…) So, this platform is a little bit limited and there are several things that we cannot do because of that! (…) So, we are studying some possibilities… even switch the platform that we use! (Interviewee C)

So, in general, the improvements done regards the practices adopted by the managers to thrive in the market. It happens because the wide majority of the platforms have no access or even conditions to change the interface, or the algorithm of the platform as seen in Figure 13 and previously explained. They have no access to any data to understand customer behavior. Therefore, these platforms rely on managerial aspects to differentiate one from another.

4.2.10 Payments

In general, regarding this enabler, the interviewees reported the pricing mechanism strategies and its effect on the platform performance. Table 20 summarizes the strategies found.

Table 20 – Characteristics of the enabler Payments in Local Mobility Platforms

Enabler	Strategies

Payments	- There is not a preference of cash over debit or credit cards; - 3 prices is controled: basis price, minimum value and price per km; - Basis price; - Minimum value; - Price per km. - Managers often compare prices between platforms in different times to estipulate their; - Different prices on night times and weekends; - Price is negotiated between manager and driver; - Managers should find price that is attractive both for drivers and riders: this is done sensing the Market; In general: - Low prices attract riders but put away drivers; - High prices attract drivers but put away riders

Source: Prepared by the author

In general, drivers did not present any preference regarding different payment methods when they are paid by the passengers: cash, debit card or credit card. They often complain about the taxes charged by the card machine which is on the driver. However, the benefit of being safer than cash, let both options on the same level of the value proposition (Interviewee J I, and G).

The managers' opinion was also scattered (Interviewee A and D), even though Interviewee F highlighted that in Lavras, emphasizing as a characteristic of a small town, that the passengers normally pay using cash: "Well, the card is good because you don't keep driving with a lot of money… But here in Lavras… most rides are in cash… I'd say 80% prefers to pay in cash"

For passengers more price sensitive, as Interviewee N, the price of the ride is the most important factor in her decision-making process. Considering this, she reported that she misses the possibility to put money inside the platform using a specific bank because she would get discounts.

Also, there is the payment method used by the drivers to pay the managers. According to our interviews, in general, the managers charge a percentage per each ride done. However, the developer stated that:

> In inner cities, it's more common than the monthly payment method. The driver must pay monthly [to work on the platform]. Or, weekly…

> [both] instead of a percentage per ride. Or even both [payment] methods. But then the driver pays a monthly value and the app charges a lower fee for each ride (Interviewee J)

When Interviewee E was asked why they choose for a monthly value he answered:

> Strategy! Strategy. To become easier for the driver and for the driver's money doesn't pass through the company. The rides are paid inside the car, and each driver has his card machine… The driver's money is his. He'll pay the monthly value and go work. (Interviewee E)

With respect to the monthly fee, the drivers (Interviewee F and G) explained that it becomes easier for them to know when it is compensating to drive for the platform that charges the monthly fee. They informed that they need to work until he pays the monthly fee and then he paid back the investment to chose to work on that platform.

On the other hand, it is not so easy to do the calculus to inform which platform is better for him to work, in financial terms. Because his profit varies on the number of drivers that a certain platform has, the demand, and all the variables that influence on the demand such as brand identity, investment in advertising, adoption of that platform in a determined city, etc.

The pricing mechanism on the platforms was explained mostly by Interviewee A and F: It is based on two prices: a base price plus a value per kilometer. For instance, considering that the base price is R$ 8.00, and the value per kilometer is R$ 1.00 if a rider travels for 1km he will be charged a value of R$ 9.00. However, they also set a minimum price regardless of the kilometers traveled. For the same example, consider that the minimum price is R$ 10.00, for the same travel of 1km the rider would actually pay R$ 10.00 because the base price plus the value per kilometer is lower than the minimum price. Thus, using the same values, the rider would be charged R$10.00 until the second kilometer traveled. If he travels 1.5 kilometers, the value to be paid is R$10.00. For any kilometer up to 2km, it will be charged R$10.00 (the minimum price) plus the value per kilometer (R$1.00).

Thus, the base price serves as a basis of reference to not increase the value per kilometer drastically and still charging a fair fare. For instance, suppose that the base pricing does not exist, if a manager wants to charge R$10.00 for 1km traveled, the calculus would be R$10.00 per km. And thus, 2km travel would be expensive (R$20.00). But if he wants to charge R$11.00 for a 2km travel, he needs to set a base price of R$10.00 and state that the cost per km would be R$1.00.

Following the same reasoning, the existence of the minimum value serves to pay a reasonable value for a small distance, such as 0.5km. If there are few drivers, the

manager must take into account the distance traveled by the driver to take the passenger. Thus, in this schema, if the minimum value of the ride is R$10.00, the base price is R$8.00, and the price per km is R$1.00, the value to be charged for a 0.5km is R$10.00. And R$10.00 will be charged until the 2km.

It is important to highlight that none of the platforms interviewed charges considering time. They consider only the distance traveled. Therefore, the managers must control 3 prices: basis price, minimum value, and price per km. Interviewee F explains how he stipulates his price:

> I open all the platforms and simulated the prices. For short, medium and long distances. So, I see [if] my fare is good [or not]! (…) [and in case of need to change the fares] I advise all the drivers: guys, this is the price that we can work! This is a fair price. Good for us and for them (the passengers). If it's good for the drivers [only], thus for the passengers not because it becomes expensive, and then no drivers would work [because we'd not get rides]. So, we need to work with our resources… and if (Company A) wants to work cheaper, (company A) can! I'll not lower my prices because this is my limit. And, thus suddenly, his driver doesn't want more (rides become too cheap and no driver would be interested). So, we need to do that, otherwise, the passenger will always want to take advantage!

Thus, Interviewee C reported that they use the same strategy arguing that lowering the prices attracts passengers. Also, Interviewee C and F reported that they work with different minimum values at night times and weekends. Interviewee E who manages the same company in more cities stated that the presence of Uber on the city influences a lot on his pricing:

> [cities that] Uber works for R$6.65, why I would enter on that inner city and charges R$ 6.65? If a taxi cab which doesn't have a taximeter goes from there to there charging 30? Because they are used to another reality, right? But if they're used with Uber, then, my price will be like Uber! I won't charge more expensive. My attractive is to let my driver pay less! This is how it works!

In other words, Interviewee E explained that if a city does not have Uber, the population is used to pay expensive for a taxi. Thus, he is able to charge more expensive prices. However, if Uber already exists in that city, he will charge the same as Uber.

From that, it can be seen that the pricing mechanisms follow the market pressures in which the platform is immersed. For instance, Interviewee A informed that he also stipulates his prices considering the gas and car washing prices. In general, expensive rides are good for drivers, but no passenger would use the service. Cheaper rides attract passengers but move away drivers. So, managers are constantly trying to find a balance between both sides of the platform.

4.2.11 Design Elements

With respect to the design elements in the architecture of a platform, it was found that they, in general, follows the same pattern of a well-established platform, only two elements differ (i) nature of interactions, which brings more relationship-based aspects; and (ii) nature of transaction, which probably due to the proximity of the driver and passenger as seen on Transaction function, different request might be asked by the riders. Table 21 shows the design elements of local mobility platforms.

Table 21 – Design Elements of Local Mobility Platforms

Design Elements	**Description**
Market Focus (What are the players that the platform should attract first?)	Drivers, passengers, and other stakeholders. The first focus must be on drivers, as he will be responsible to drive passengers to their destination.
Type of Interactions (What is the number of players mobilized while seeking a match?)	It begins with one-to-many (when a call occurs and it rings to several drivers) to then filter and arrive in a one-to-one (when a driver is assigned to a passenger). Also, it is important to consider that we refer the "one" as the call because the passenger that calls in the app might be accompanied by more persons.
Nature of Interactions (What is the objective of the interaction?)	It is essentially transactional. However, when the driver is a relative, friend, acquaintance, or even when a friendship is created between driver and passenger, it turns out to be a relationship-based – since the apps normally give you the possibility to set a certain driver as your favorite.
Level of Intermediation (In which level does the platform intermediate the relationship between players?)	Directly: driver and passengers. There are no intermediaries between the connection of drivers and passengers.
Nature of Transaction (What is the characteristic of the value transacted?)	Standardized service: when it is a normal ride or, Personalized service: when a passenger asks for a particular demand: for freights, pets, etc.)
Platform Currency (What is the currency of the platform?)	Cash
Business Model (What is being carried and who owns the asset?)	Mostly persons, therefore: P2P Mobility marketplace
Service Model (Who operates the asset?)	The asset owner: P2P Service Model and For-hire
Mobility Application (Is the fee splitted among	No Ridesourcing App

Design Elements	Description
passengers?)	

Source: Prepared by the author

According to Schor (2017), the sharing economy platforms are highly influenced by the mean in which they are inserted. This takes into account the users' behavior (drivers and passengers), and hence, influence the way that the platform is managed. Therefore, it creates managerial specificities. In this sense, it was identified the necessity to elaborate on the following topic which explores those specificities regarding the context and their importance over the managerial practices.

4.3 Managing Network Effect on Alternative Mobility Platforms

Considering the architecture described the local mobility platforms, a key topic deserves special attention, which justifies this separate topic in this dissertation. The specificities of the managerial practices adopted by the platforms are reinforced by the fact highlighted by Constantinou, Marton & Tuunainmen (2017). These authors argue that the strategic dynamics of the shared economy platform are different from traditional industry companies which have to build "high entry barriers and providing first mover advantages" (p.234).

As the sharing business models are heavily influenced by the context in which they are inserted, studies regarding these platforms cannot be generalized. The fact of being in smaller cities brings more specificities in relation to the way they operate. In this sense, we suggest the concept of Alternative Platforms to refer to sharing economy platforms that are inserted only in inner cities. Following the same reasoning, in contrast, we also suggest the concept of Traditional Platforms to refer to shared economy platforms well-established in big markets such as Uber, 99, AirBnB, iFood, and so on.

Thus, sharing economy platforms must take into account the fact that the value provided to its users increases as more users join the platform – the network effect (CHOUDARY, 2015; PARKER; VAN ALSTYNE; CHOUDARY, 2016; REILLIER; REILLIER, 2017). However, considering mobility platforms such as Uber or Lyft, as Currier (2018) pointed out, they have a threshold of value: Riders waiting 4 minutes or 8 minutes have a considerable difference in the value given to them. But to wait from 2 to 4 minutes has no difference at all (VIEIRA, 2019). In other words, it totally relates to the number of drivers in the platform: A platform with X drivers will meet a passenger in Z minutes. To increase the number X to reduce Z will be attractive for the riders at a certain point since from 2 to 4 minutes, the passenger does not see any value added. So, the network effect, in this case, has a different behavior for the passengers' side , which Currier (2018) state as asymptotic.

Notwithstanding, this study also found a similar effect on the drivers' side. This effect plays a key role in the platform functioning since the driver is also a customer of the platform and actually the producer, whom no driver no rides. To control the number of drivers as we previously mentioned is important not only for the riders but also for the drivers. Because up to a point to increase a driver, is to divide the profit per driver with all the drivers. So, to a certain extent it is important to have a considerable number of

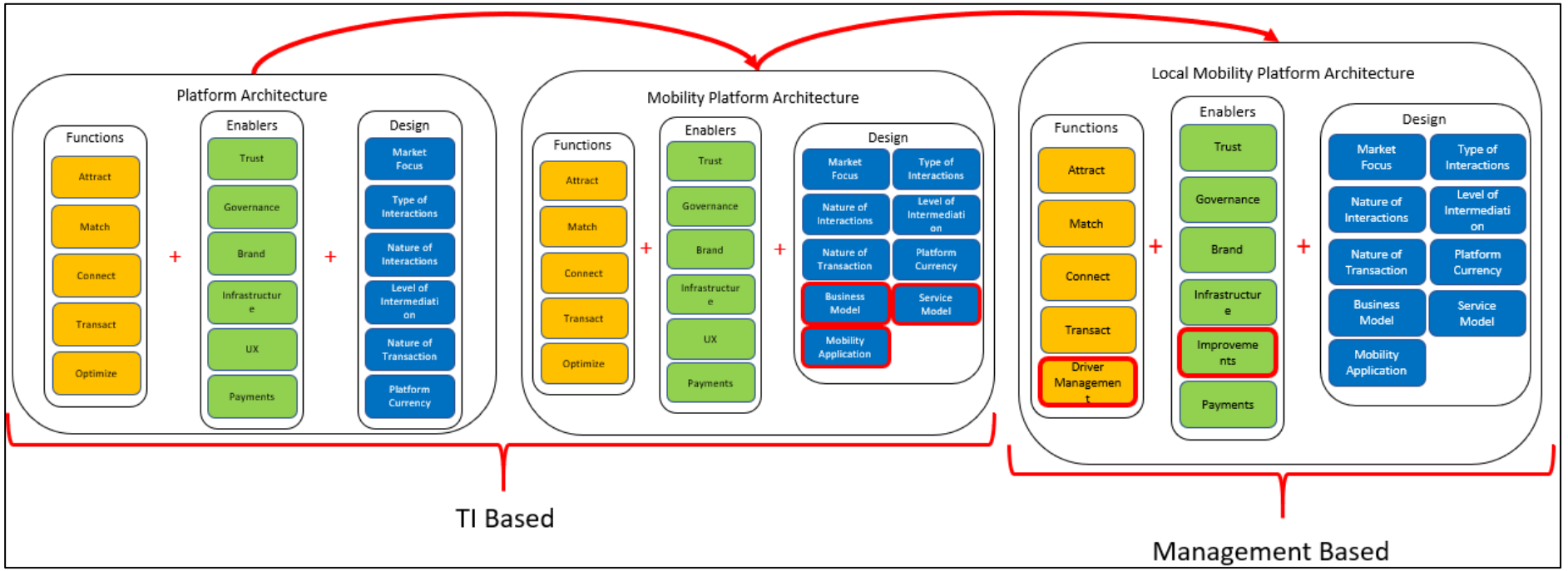
drivers: to avoid the feeling that the platform does not work, to meet riders demand, to ensure that the platform entails different markets, etc. However, there is a point that if the manager puts more drivers, the platform will become unattractive for them because the profit turns out to be not attractive. Thus, there is an asymptotic value curve also for the drivers.

Secondly, drivers reported that they value the proximity and other benefits that have significant costs on the platform's operation: to have a headquarter, give the luminous sign, offer health insurance and being supplied with water and candies, etc. By doing that managers increase the cost of the platform. However, they must be cautious about doing that because they do not get scale advantages, since the more drivers the platform has, the less value they are giving to them. Therefore, a considerable problem would happen if a manager increases the driver's fees to cover their benefit expenditures. Thus, there is also a threshold on giving this type of value to the driver – another characteristic of the asymptotic behavior on the drivers' side.

5 FINAL CONSIDERATIONS

This dissertation had as research question: What is the architecture of a local mobility platform, and how does it is managed? To answer that question, we built a framework of the architecture of the local mobility platforms which is shown in Figure 17.

Figure 17 – Alternative Local Mobility Platform Architecture framework construction



Source: Prepared by the author

Comparing to the existent literature, from 7 platforms analyzed in Minas Gerais, it was found a new function that they must execute which is called Driver Management. This function regards the creation of a good environment for the drivers in order to make them loyal to the platform. To do so, may benefit are offered to the drivers, from lower fees to headquarters, health care plans and the control over the number of drivers creating a feeling of belonging to a private group.

With respect to the transact function, it was seen that the driver often performs different functions from beyond to drive. As a characteristic of small and inner cities, and due to the fact that the platforms control the number of drivers, frequently a driver may take the same passenger. Hence, they are able to establish a considerable close relationship, which may influence the rider decision to choose one platform over another.

In addition, the function optimizes and the enabler UX is not executed by these platforms due to the fact that they normally do not have available data to analyze. On the other hand, they are able to make some minor improvements that do not ask change on the algorithms. Also, it is important to consider that the way that these platforms are managed is very important to them since the wide majority of these platforms are rented and they share the same system. Thus, in order to differentiate in the market, managers may rely on managerial aspects of the platform, maintaining a close relationship with drivers from different social realities to broaden its market.

With respect to the design elements, in general, the platforms follow the same pattern of a well-established platform, with exception to the elements of nature of interactions and nature of the transaction. Both elements are influenced by the proximity between passenger and driver, which leads to a relationship-based interaction and personalized service when a passenger asks a particular demand.

The closer and dedicated care to the driver are becoming a differential of these platforms, offering such benefit that hampers the entrance of well-established platforms in small and inner cities. This is the case of Santa Rita do Sapucaí, Itajubá, Paraisópolis, and it is starting to happen on Unaí, Pará de Minas and Formiga – all cities from the state of Minas Gerais.

Therefore, due to the fact that the global mobility platforms and the local ones are TI based and management based, respectively, it is important to highlight that the improvements of the local platforms do not provide many strategic advantages to the platform owner since the data cannot be accessed by him, neither drivers nor passengers. In other words, the platform acts solely as a connector between drivers and riders, not

creating value through technology relying then, on human and managerial aspects. Thus, it is not possible to affirm whether this differentiation would be enough to compete against the global platforms that bring an IT management-based infrastructure. Perhaps in an immediate time interval, the global platforms might not have much power due to the proximity between users and drivers.

Local platforms seem to be a cheap alternative and a simple manner to connect supply and demand not using advanced tools of IT (AI, for example). This leads to the expectative that there might be platform niches with different intelligence levels. So, will there be more platforms that simply do the job of optimizing what is already being done by human hands, but without full automation? Are these the future trends of local platforms, where the big ones are unable to enter?

In order to explore these future topics, this research brings considerable theoretical contributions. As a research gap, no previous literature explored the phenomena of local mobility platforms. Considering this, this dissertation contains a description of the platform business model elements that make those businesses defensible from well-established platforms. By doing so, (i) newer architectural elements were found; (ii) it was evidenced new strategies to capture a gap of value not previously mentioned on the theory; and (iii) a new category of network effect with respect to the drivers' side was also found.

Another theoretical contribution concerns the concept of shared economy platforms that operate in inner cities. As the sharing business models are heavily influenced by the context in which they are inserted, studies regarding these platforms cannot be generalized. The fact of being in smaller cities brings more specificities in relation to the way they operate. In this sense, we suggest the concept of Alternative Platforms to refer to sharing economy platforms that are inserted only in inner cities. Following the same reasoning, in contrast, we also suggest the concept of Traditional Platforms to refer to shared economy platforms well-established in big markets such as Uber, 99, AirBnB, iFood, and so on.

As managerial contributions, this work presented brand building strategies regarding the importance of driver's participation in the success of the platform. Thus, those strategies suggest that drivers feel valued and that they are able to realize that the relationship with the platform brings benefits that go beyond the financial gains and working relationships between them. Still, strategic actions that raise the feeling of trust by the passengers on the drivers of the platform should be used. For instance, use drivers

that have similar profiles to the passengers of a certain region (neighborhood, institutions, etc.) might unleash a trust feeling from the passenger due to the identity relationship.

For the well-established mobility platforms, these works suggest paying more attention to the service provider regarding his role and importance to the service. Hence, it can be seen that drivers are not interested in joining the global platforms because the benefits provided by local platforms are higher.

We conclude that the participants in the sharing economy are usually professionals who already work in the mobility business (some of them taxi drivers) who are using the platforms to increase their income. In addition, the activity, especially of drivers, is generally composed of workers with a lower educational level and, in most cases, less favored people, who traditionally perform a large part of the work for the general functioning of the platform (that is, the chauffeur service). In a sense, this is not surprising. In times when income and employment are scarce, it is natural that there will be a ripple effect in the labor markets, as people accept jobs that they would not accept in better economical situations. The second line of argument in terms of social contributions is that this type of business model may be favoring business structures that undermine the Consolidation of Labor Laws (CLT).

Overall, platform owners expressed strong feelings of satisfaction. However, whether that attitude will last is an important question. Conditions may be changing as platforms expand and attract a less educated and more exploitable group of suppliers. Ravenelle (2017), shows a very pessimistic perspective, however, her research was carried out in an economic environment quite different from the reality studied in this research. The difference in the platforms she studied or the demographic differences between her sample from this research sheds light on the discussion that the sharing economy cannot be separated from the context of the market in which it operates.

Although most discussions about the sector consider it in isolation, the ability of platforms to attract suppliers or producers (drivers in this case) will depend on alternative opportunities in the job market. Many platforms launched during a financial meltdown and recession dominate local labor markets, which undoubtedly increases their pool of available labor (SCHOR, 2017). Perhaps a strategy to be used by the platforms is to improve the earnings and the terms of the contracts and essentially also with the care and proximity to the drivers to guarantee a solid base of suppliers.

With respect to the limitations, it relates to the research approach used. Although it was used interviews, non-observatory research and documental analysis along the

whole value creation chain (from developers to passengers), this work did not use quantitative methods which would allow the generalization of results. However, it shed light on the cornerstone of the local mobility platforms' strategic force: the drivers' management and their proximity to the passengers. This limitation leads to future researches, applying the same theoretical lens seeking to validate the analytical categories and brings a deeper understanding of the categories studied.

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APPENDIX A

This Appendix 1 shows the drivers' interview script.

Function/Enabler	**Question**
Attract	What attracted you to drive for this platform? How did you know the app? Why do you work for this platform and not another?
Attract	Is there any incentive to make more rides? If so, how does it work?
Brand	Does people call you as uber driver? What do you think about that?
Connect	How does the passengers find you and communicates with you? Is that important?
Governance	Does the platform have a guiding principles manual that explains what drivers and passengers must/must not do?
Infrastructure	What is the infrastructure required to allow the good functioning of the service?
Match	How is defined which passenger goes with you? Do you like this mechanism? How do you feel?
Optimize	Are you free to suggest improvements to the platform? Do you have proximity to talk to the manager if necessary?
Payment	Which payment method do you prefer? Why? Do you have to pay something to the platform?
Transact	Are you more than a driver? Could you tell a funny or unusual story that happened?
Trust	What makes you trust in the platform? What do you think makes the passengers' trust in the platform?
Extra	Do you know if a platform tried to ente in the city? If it failed: why do you think it happened?

APPENDIX B

This Appendix 2 shows the managers' interview script.

Function/Enabler	**Question**
Attract	How do you attract drivers? And passengers?
Attract	What do you do to keep them interested in drive/ride for/on this platform?
Brand	Do you think that Uber's existence in the market helped? Do people call your app like uber? Is that good?
Connect	How do passengers and drivers identify and communicate themselves?
Governance	Does the platform have a guiding principles manual that explains what drivers and passengers must/must not do? Could you give examples of rules?
Infrastructure	What is the infrastructure required for the platform work properly?
Match	How is defined which passenger goes with which driver?
Optimize	Do drivers have proximity to suggest improvements? Are they feasible?
Payment	How do you do pricing? Which payment method drivers and passengers normally prefer? Why?
Transact	Could you tell a funny or unusual story that happened?
Trust	How do you establish trust in the platform? What makes the drivers trust on the platform? And the passenger?
UX	Do you analyze user behavior? How is this done?
Extra	Do you know if a platform tried to ente in the city? If it failed: why do you think it happened?
Extra	What are your rivals?
Extra	How was the decision to operate in this city?

APPENDIX C

This Appendix 3 shows the developers' interview script.

Function/Enabler	Question
Attract	In general, how do the platforms attract drivers? And drivers? Is there a balance between the number of passengers and drivers recommended? How to achieve this balance? Do you know what is their main motivation?
Attract	Is there a mechanism to incentives drivers and riders make more rides? If so, how does it works? Is there a strategy like this to the passengers? How does the platform grow?
Brand	Do you think that Uber's existence in the market helped? Do people call your app like uber? Is that good? Do you use that somehow? What people that dislike your business normally say?
Connect	Which mechanism can be used for passenger sand drivers to identify themselves? What do they normally prefer? Why?
Governance	Do you recommend a guiding principles manual for the managers? Which information has this manual? If no, why?
Infrastructure	Which infrastructure do you ask for the platform to work? And for you guys? What do you need to have to make the platforms work?
Match	How is defined which passenger goes with which driver? What are the mechanisms? Contest, election…?
Optimize	In general, how do the update happen? How it is discussed the modifications?
Payment	Which are the possible payment methods between passengers and drivers? Dynamic pricing? Percent per ride? Monthly? In which format do the managers pay? Is there any additional for each driver? Is there any other mechanism? How does this choice work?
Transact	Do you intermediate the passengers' payment? Is there any bonification? What they normally prefer? Why?
Trust	How do you establish trust in the platform? What makes the drivers trust on the platform? And the passenger? And managers
UX	Do you analyze user behavior? How is this done? How do that help on platform managing?
Extra	Do you know if a platform tried to enter in the city? If it failed: why do you think it happened?
Extra	What is the profile of the persons that use your services?
Extra	What is normally discussed when someone decides to be a platform manager?
Extra	What are the difficulties that managers normally find?
Extra	Would it be possible to inform what are your customers in the state of Minas Gerais?
Extra	Is there any contract that restrains the development of platforms in the same city of your customers? Why? How do you see this market?
Extra	Have you noticed any pattern of difficulties or preferences by certain optional by region (inner/capital city/north/south/etc.)?

APPENDIX D

This Appendix 4 shows the passengers' interview script.

Function/Enabler	**Question**
Attract	How did you know about the platform? Why you chose this platform over another?
Brand	Have you already called this platform like Uber or the driver as Uber's driver? Why?
Connect	Have you already needed to talk with the driver while he's coming? How do you know if a car coming is yours?
Governance	How did you learn that you use the platform this way or another? Do you know the requisite to become a driver on that platform?
Infrastructure	Have you noticed if any infrastructure element influence on your behavior using the platform?
Match	Have you already called a driver out of the app? If so, why you do that?
Optimize	Do you think of something that could be improved? Do you have proximity or a way to inform them?
Payment	What payment method do you prefer? Why?
Transact	Have you already had a funny or unusual story with the platform? Have you in any case asked the driver help to do something? Does that change your relation with the platform? Do you start to choose this platform over another? What would it take for you to use this platform every time you need a ride?
Trust	Why do you trust this platform? What makes you trust on the driver?
UX	Have you already been asked by the driver whether you are liking or not the app?
Extra	Have you wished to use another platform here? Whado you think about that?
Extra	Have you already used Uber? On which frequency?