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Original Article

How has COVID-19 influenced changes in a platform business model of a startup? Alloy's case study

Como a COVID-19 influenciou mudanças em um modelo de negócios de plataforma de uma startup? Estudo de caso da Alloy

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ABSTRACT

Purpose – This study aims to identify the changes in a startup's platform business model (PBM) due to COVID-19, considering the properties of value proposition, value creation, and value capture in three periods: Pre-COVID-19, During COVID-19 and almost Post-COVID-19.

Design/Methodology/Approach – This inductive qualitative research is based on a longitudinal and single case study of Alloy, a Brazilian startup that had to change its PBM due to the COVID-19 pandemic. Primary data was collected through interviews, complemented by secondary data such as documents and videos. Data collected refers to the period from August 2019 to July 2023. Data analysis was conducted following the content analysis approach.

Findings – Due to the COVID-19 scenario, Alloy had to change its PBM by modifying its value proposition, value creation, and value capture, moving the focus from a transaction platform to an innovation platform. While scalability decreased due to COVID-19, the PBM changes allowed Alloy to increase its network externalities, which can influence return to scale and bring it closer to success with PBM.

Research limitations/implications – As a limitation, this study focuses on a single case study. Although it is singular, new cases can help to support our findings.

Originality/Value – The originality of this study relies on being able to follow the steps of a startup with a PBM during the COVID-19 period. In complement, a conceptual model was developed to identify Alloy's changes and opportunities to succeed with its PBM, which can be helpful for academics and practitioners.

Keywords: Platform Business Model; COVID-19; Startup

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RESUMO

Objetivo – Este estudo tem como objetivo identificar as mudanças em um modelo de negócio de plataforma (PBM) de uma startup devido ao COVID-19, considerando as propriedades de proposta de valor, criação de valor e captura de valor em três períodos: Pré-COVID-19, Durante COVID-19 e quase Pós-COVID-19.

Metodologia – Esta pesquisa qualitativa indutiva é baseada em um estudo de caso longitudinal e único da Alloy, uma startup brasileira, que teve que alterar seu PBM devido à pandemia do COVID-19. Os dados primários foram coletados por meio de entrevistas, complementados por dados secundários, como documentos e vídeos. Dados coletados se referem ao período de agosto de 2019 a julho de 2023. A análise dos dados foi realizada seguindo a abordagem de análise de conteúdo.

Resultados – Devido ao cenário do COVID-19, a Alloy teve que mudar seu PBM modificando sua proposta de valor, criação de valor e captura de valor, passando o foco de uma plataforma de transações para uma plataforma de inovação. Embora a escalabilidade tenha diminuído devido ao COVID-19, as mudanças no PBM permitiram aumentasse suas externalidades de rede, o que pode influenciar o retorno à escala e aproximá-la do sucesso com seu PBM.

Limitações/implicações da pesquisa – Como limitação, este estudo se concentra em um estudo de caso único. Apesar de sua singularidade, novos casos podem ajudar a sustentar nossos achados.

Originalidade/Valor – A originalidade deste estudo está em poder seguir os passos de uma startup com PBM durante o período de COVID-19. Em complemento, foi desenvolvido um modelo conceitual para identificar as mudanças da Alloy e as oportunidades de sucesso com seu PBM, o que pode ser útil para acadêmicos e profissionais.

Palavras-chave: Modelo de Negócios de Plataforma; COVID-19; *Startup*

1 INTRODUCTION

The Digital era enabled the emergence of platforms as a business model (BM) that creates value for multiple actors (Vaska, Massaro, Bagarotto, & Dal Mas, 2021). The relevance and attractiveness of the platform business models (PBM) can be perceived if we consider that many of the world's biggest companies nowadays have platform business models, such as Apple, Amazon, Alphabet, Microsoft, and Alibaba Group (Gawer & Srnicek, 2021).

Platforms are complex businesses that need to create and share value while triggering network externalities, providing a return to scale, avoiding multi-homing, pursuing the lock-in effect, and positioning as a "winner-take-all" (Cusumano, Gawer, & Yoffie, 2019). Previews research on platforms emphasized the network effect as the main factor influencing participants' value creation (Karhu & Ritala, 2021; Song, Xue,

Rai, & Zhang, 2018). As a result, the network effect leads to a winner-take-all situation where new entrants cannot compete with lead platforms.

Entrepreneurs who decide to establish new firms based on platforms need to break down how to operate and profit using PBM, deciding who should participate in the multi-sided market and how to distribute the value created (Kazan, Tan, Lim, Sørensen, & Damsgaard, 2018). However, new firms and entrepreneurs may struggle to enter platform markets to get a slice of these markets. New entrants may fail because of mispricing on one side of the market, oversubsidizing participants, or entering markets too late without creating new value (Teece & Linden, 2017). Their primary strategy is to change their BM to provide a competitive advantage in front of the competitors (Cusumano, Yoffie, & Gawer, 2020).

However, changing a PBM may involve modifying and realigning its main components as value proposition, value creation, and value capture. These changes can lead to the loss of the current customer base, which impacts the main proprieties of a PBM, such as scalability and harm network effect. Besides the complexity of a PBM itself, during the COVID-19 crisis, the environment challenged these new entrants, forcing entrepreneurs of flexible organizations with limited resources, such as startups, to imaginatively rethink the BM due to unexpected and radical changes.

Usually, startups are designed to create new products and services in high uncertainty conditions (Ries, 2011). Their main characteristics are innovation, scalability, repeatability, flexibility, and speed (Pimenta & Lana, 2020). These characteristics may help this kind of firm to survive during a crisis scenario, creating a singular event to study.

In this sense, considering the COVID-19 scenario, the challenge of succeeding with a platform business model, and the typical characteristics of a startup, our research aims to understand: *How has COVID-19 influenced changes in a startup's platform business model?*

To answer this question, we analyzed a case study of a Brazilian startup, Alloy, that operates a platform business model (PBM) and went through the COVID-19 crisis.

To survive, Alloy had to change its business model. To understand these changes in detail, especially for a startup that was in the middle of an acceleration process and with a scalability strategy in progress, we conducted a case study, collecting longitudinal data from multiple sources (interviews, documents, videos) and actors, including Alloy's CEO, Accelerator Manager, Mentor, Investor, Customer, and others.

This research contributes to advancing the understanding of how firms dealt with the COVID-19 scenario and which changes they made to survive. This is particularly relevant considering startups, which have the characteristics to be more flexible than traditional organizations to pivot their business model. In addition, the platform business model is a recent phenomenon that still lacks theorization (Zhao, von Delft, Morgan-Thomas, & Buck, 2020) and has become a topic of interest, especially due to COVID-19 context (Stoian & Tohanean, 2020). We contribute by developing a conceptual model of PBM shifts and complementing research that investigated business model innovation on startups (Still et al., 2017; Täuscher & Laudien, 2017).

Furthermore, Alloy's customers are mainly small and medium enterprises (SMEs), and the platform can foster the digitalization of these kinds of enterprises (Li, Yang, Jin, & Wang, 2023). This also fills a gap in the BM literature that asks for more studies on digitalization, the use of digital technologies to transform traditional business models, processes, and operations (Carmo, Jerónimo, Pereira, Dias, & Patricio, 2023) and how the business models changes occur in practice (Baber, Ojala, & Martínez, 2019).

Practitioners can also learn from the strategies adopted by Alloy while using our conceptual model to position business models and understand how they are performing to achieve a platform status.

This paper is structured in five sections besides this introduction. In the next section, we present an overview of the platform's business model and innovation. Then, in section three, we present our method, followed by the results in section four. Section five presents the discussion, and finally, we have the conclusion in section six.

2 PLATFORM BUSINESS MODEL (PBM)

The business model is the artifact or interface that connects the entrepreneur(s) idea of value to the market need, explaining how firms do business and how value is created and captured (Piñeiro, Oliveira, Cruz, & Patias, 2017; Teece, 2010; Zott, Amit, & Massa, 2011). A business model indicates the product or service offered, the target customers, the firm's core activities, processes, and resources, the value network (key actors within the ecosystem where the firm operates, including suppliers and partners), the pricing and revenue model (Baber et al., 2019; Teece & Linden, 2017).

The platform business models emerged as a new type of business logic where value is created and captured by facilitating interactions between different actors, usually buyers and sellers (Baber et al., 2019). PBM expands the traditional business model perspectives from "firm-customer" to multiple actor perspective where the platform connects and allows diverse actors relations (Fehrer, Woratschek, & Brodie, 2018).

While a platform can be described as a technological solution or infrastructure that uses the Internet to enable interactions among those different actors, creating value for those or at least one of these groups (Parker & Van Alstyne, 2018), the platform business model "is a new business model that uses technology to connect people, organizations, and resources in an interactive ecosystem in which amazing amounts of value can be created and exchanged" (Parker, Van Alstyne, & Choudary, 2016, p. 3).

Platform business models are usually distinguished into three types: a) transaction platforms; b) innovation platforms; and c) hybrid platforms (Cusumano et al., 2019; Teece & Linden, 2017). Transaction platforms mediate the interaction between different groups of users (e.g., buyers and sellers such as Airbnb and Uber) (Rochet & Tirole, 2003; Trabucchi, Buganza, Muzellec, & Ronteau, 2021). Innovation platforms provide an extensible codebase where third parties can develop complementary modules (e.g., Apple iOS, Google's Android**)** (de Reuver, Sørensen, & Basole, 2018;

Tiwana, Konsynski, & Bush, 2010). Hybrid platforms contemplate both types, of transaction and innovation platforms (Cusumano et al., 2019).

As part of the business model design, there is a need to define the *value proposition* (VP). VP can be defined as the description of products and services that create value for the customer segment (Osterwalder, 2004; Osterwalder & Pigneur, 2010). In a broader view, we can define it as the presentation of firm products and services, identifying the value generated and to whom. This definition is based on Skålén, Gummerus, von Koskull, and Magnusson (2015), who cite that the value promises involve customers and other actors. This definition fits with PBM, which has different actors in the platform expecting to capture value, and in some cases, two or more VPs are needed to contemplate different actors (Muzellec, Ronteau, & Lambkin, 2015).

In a PBM, value is created and captured by the networking activities of the actors since no single actor can create alone the same amount of value they create together (Thomas Eisenmann, Parker, & Van Alstyne, 2011; Melamed & Petit, 2019; Parker & Van Alstyne, 2018). In this sense, platforms must have users that perceive the value proposition that the platform is creating or delivering to them, helping to scale it and increase the network externalities; that is, the value creation increases as the number of actors on the platform increases. However, especially in the beginning, there can be a "chicken-egg" problem (Caillaud & Jullien, 2003). To engage in the platform, actors from one side are waiting for the other side to be available on the platform. For example, buyers will be more willing to use a platform with many products and services available. However, sellers will not join the platform if there are not enough buyers.

To manage and motivate these external relations and networking interactions, platform business models must offer a set of rules to support these interactions (Gatautis, 2017; Parker et al., 2016). These rules, along with interaction mode, governance, and ownership structure of the platform are established by the platform lead firms (e.g., Apple, Google, Uber, iFood) and need to be aligned with the value propositions defined (Asadullah, Faik, & Kankanhalli, 2018). Indeed, the

value propositions defined for each type of actor highly depend on the other actors' activities (Leiting, Külschbach, & Stich, 2023).

In this sense, on the PBM design, the lead firm must consider the *value creation* and *capture* properties definition since the mechanisms of *value creation* are relevant as the strategic plans of *value capture* of each actor of the platform (Fehrer et al., 2018; Khademi, 2020).

A PBM *creates value* through *network externalities (effects)*, which means the platform's value increases as the user base increases. Direct externality happens when the number of same side users of the platform increase (e.g., gamers of a videogame console), and indirect externality occurs when the number of all sides of the platform increase (e.g., suppliers and buyers in a marketplace platform) (de Reuver et al., 2018; Katz & Shapiro, 1985). The *network effect, direct and indirect*, increases *returns to scale*, meaning that outcomes increase proportionately more than costs (T Eisenmann, Parker, & Van Alstyne, 2006; Murray & White, 1983).

The network effect and return to scale lead to "*winner-take-all*" dynamics, and the leading platforms concentrate the market. However, the "winner-take-all" may not happen in *multi-homing* scenarios, where the user has more than one platform option or when the network effect is local or operate in a small niche. For this reason, PBM's leader tries to develop *lock-in* strategies, increasing the users' cost to change to another platform (T Eisenmann et al., 2006; Gawer, 2021; Rahman & Thelen, 2019).

Although value creation is essential, the amount of value that each actor captures is exceptionally relevant, mainly because actors in the platform that do not capture value may leave, harming the *network effect* and hinder the growth and development of the platform (de Reuver et al., 2018; T Eisenmann et al., 2006).

In this sense, platform leaders need to ensure the platform is and continues to be scalable and with positive network externalities, paying attention to market conditions, needs, and changes, even if this requires adjusting the platform business model (Fehrer et al., 2018).

Whenever a firm changes how it defines its value proposition, creation, and capture, it is doing a business model innovation (BMI) at the organizational level (Hutahayan and Wahyono, 2021; Stoian & Tohanea, 2020). An innovation can occur at the firm, industry, national or international level. The higher the level, the more likely the innovation does not exist elsewhere (OECD & Eurostat, 2018).

A BM can innovate according to its scope (modular or architectural change) and novelty (new to the firm or industry) (Foss & Saebi, 2017). A modular change modifies one or more BM modules, while an architectural change modifies the entire system that cannot be decomposed into modules. An evolutionary BMI (combination of modular scope change and new to the firm novelty) fine-tunes processes and occurs naturally over time. An adaptative BMI (architectural change and new to the firm) changes the whole BM. A focused BMI (modular changes and new to the industry) and complex BMI (architectural change and new to the industry) are the processes that lead to disruption in the market.

While the PBM may be the outcome of a traditional BM innovation (Gatautis, 2017), the PBM innovation may also differ related to its scope and novelty dimensions at different BM stages of development and due to internal or external factors (Jia, Su, Cui, Wu, & Hua Tan, 2023). Internal reasons that lead to PBM change include managerial cognition, strategic changes, organizational characteristics, dynamic capabilities, and internal resources (Jia et al., 2023). External reasons include regulatory changes, customer preferences, technological innovation, competitive environment, market opportunities, and exogenous pressure, which is one of the key factors that drive these changes, such as the COVID-19 crisis (Jia et al., 2023).

The scope under control of a platform may include its architecture (technical infrastructure and design of the platform, services), offerings and functionalities provided by the platform, and governance (rules, policies, and decision-making processes that guide the platform's development and operation. These three dimensions (architecture, offerings and functionalities, and governance) mirror each

other and must be considered simultaneously in each phase of the platform evolution to expand the platform value (Jovanovic, Sjödin, & Parida, 2022).

Research on the field has suggested that established firms relied on the factors under their control, such as superior technology infrastructure, first-mover advantage, incentives, and subsidies, creation of social forums, and platform scope to attract participants, solve the early-stage conundrum of platforms, and trigger the network effect (Murthy & Madhok, 2021). Several studies indicate that platforms innovate or evolve in the dimensions that are related to the platform scope and are under the control of the firm (Baber et al., 2019; Berkers et al., 2020; Daradkeh, 2023; Foss & Saebi, 2017; Jovanovic et al., 2022).

In summary, a platform business model is a complex structure that requires the alignment of value proposition, value creation, and value capture properties from different perspectives (such as the platform and the participants). Changes in one property may impact the others and require a rethink of the whole structure and how the platform operates internally and externally (O'Mahony & Karp, 2022).

While a change in the PBM scope (modular or architectural) impacts the relation of the platform with other participants, an innovation on the firm or industry level may not be enough to ensure a network effect will trigger, mainly because a change in the scope or novelty does not mean creation and capture of value, because the value creation and capture of a PBM are on the network effect. In other words, PBM needs to exploit and control resources that reside beyond the scope of the firm and create value by fostering connections and exchanges across the platform multi-sided market (Gawer, 2021).

More than on traditional business models, the PBM main elements (value propositions, value creation, and value capture) are interconnected and overlap, which is other in a complex way where multiple actors perspectives need to be considered. For instance, the BMI could be on VP (such as new offerings, new customers and markets, new channels), on value creation (new capabilities, technology, partnerships

or processes changes) or value capture (new or changes on revenue models or cost structures) (Still et al., 2017).

However, while the platform scope is under the platform lead control, external events may also affect the PBM. For instance, COVID-19 has impacted business in different ways (Avelar, Orefici, Borges, Campos, & Ferreira, 2022), requiring business model innovation (Guckenbiehl & Corral de Zubielqui, 2022; Münch & Hartmann, 2023). Unlike established firms that can rely on factors to recover, the effect of COVID-19 on SMEs and startups has negatively impacted their short-term performance (Mota et al., 2022; Subriadi & Kusuma Wardhani, 2022).

However, startups' distinct characteristics, such as resilience - the capacity to adjust to unforeseen occurrences destabilizing businesses -aligned with their flexibility and speed, allow them to rapidly respond to the crisis (Kuckertz et al., 2020). Through the development of highly innovative products, agile and flexible development process, assertive structuring of the team, the presence of leaders with crisis-coping skills, a clear and strategic vision for the business model, and insertion in innovation ecosystems with helping actors, startups could better respond to the adverse COVID-19 effects (Mota et al., 2022).

While platforms were crucial to the survival of many businesses, such as those that move from physical to online interaction due to the pandemic restrictions (Almunawar & Anshari, 2022; Subriadi & Kusuma Wardhani, 2022; Türkeș, Stăncioiu, Băltescu, & Marinescu, 2021; Xu, Siqin, Chung, & Choi, 2021), platforms business models also needed innovations considering the new conditions presented by the pandemic such as improving their functionalities (Grieco, 2023; Mont, Curtis, & Voytenko Palgan, 2021).

Considering the attractiveness of the platform business model, the impacts of the COVID-19 pandemic on the business, and the distinct startups' properties to do a business model innovation faster than other enterprises, we will analyze a case of business model innovation of a startup with a platform business model.

3 METHOD

We conducted a case study to understand the changes in a platform's business model due to COVID-19 with an inductive approach. A case study allows to present multiple perspectives from different actors, and the aim is to address "why" and "how" research questions (Yin, 2009). Inductive methods allow us to use data to generate new theories through theoretical sampling, which entails choosing cases based on their potential to clarify and deepen relationships between conceptions or comprehend processes (Eisenhardt, Graebner, & Sonenshein, 2016). We identified the themes in advance and derived the final model inductively from the data. The data came from knowledgeable agents that give us different perspectives of the organizational reality (Gioia, Corley, & Hamilton, 2013).

We selected the case of Brazilian startup Alloy, which has a platform business model plan and was impacted by the COVID-19 pandemic and had to adapt this business model. A couple of reasons justify the relevance of this case. First, the startup is a starting company that wants to develop a business based on a platform model. Therefore, we could follow the firm as it evolved throughout the COVID-19 crisis and understand the changes to surpass the crisis while improving the platform BM. Second, the startup allows its name to be released, allowing future researchers to follow this research and have past scientific data about the case, especially if the company keeps growing in the market. Third, since Alloy was accelerated and received one investment round, investors are interested in the company's success, increasing the startup's survival chances. However, beyond the money, Alloy is receiving help and smart money that can provide insights and networking to foster the PBM. Fourth, the proximity of the startup and the accelerator allows us to develop a longitudinal study, following the startup for several months, from November 2020 to July 2023, and collecting retrospective and prospective data related to August 2019 to July 2023. Fourth, Alloy helps in the digitalization of SMEs, an area that needs more research (Carmo et al., 2023; Li et al., 2023). Finally, Alloy is

a Brazilian startup with a PBM, which provides insights into how a global south PBM startup deals with the COVID-19 crisis and BM change.

We collected data from multiple sources, document analysis, and interviews (Creswell, 2009; Eisenhardt, 1989). The data collection aimed to understand how Alloy changed its platform business model due to the pandemic and how different actors perceived the changes. Besides, we could triangulate different sources to increase reliability (Boyer & McDermott, 1999; Tracy, 2010).

Document analysis consisted of analyzing the startup's website (https://www.alloy.al/), entrepreneurs' LinkedIn, presentations of the pitch (videos), and documents regarding its business model before and after the pandemic started.

In addition, we conducted semi-structured interviews with one of the startup owners, a customer, one investor who is also the startup mentor, and the acceleration manager. Both authors conducted together the interviews and participated in all meetings. The interview guide is available online (link will be available when paper was accepted because they are in an online repository with authors name). All interviews were recorded, transcribed, and analyzed by both researchers to identify the relevant speech that provided insights on the pre, during, and almost post-COVID-19 crisis, looking to answer questions such as what the startup was doing before the crisis, their value proposition, why they consider the startup a platform and explore the multi-sided market, network effect, and deal with competition. We also explore what happened and how they changed as the crisis struck.

Besides, we also participated in a committee meeting and an investment group meeting to understand the dynamic, where we took notes about the main topics discussed. Table 1 summarizes the interviews and participation in the committee meeting.

We applied a content analysis (Bardin, 2011) focused on identifying the impacts and changes on Alloy's business models due to COVID-19, considering the PBM properties of value proposition, value creation, and value capture. We evaluated these items before, during, and almost after the COVID-19 crisis strike. The paper

was submitted to Alloy's CEO to provide feedback on the findings and evaluate any sensible information. As criteria for reporting qualitative studies, we partially adopted the thirty-two items of Tong, Sainsbury, and Craig (2007). In this sense, periods and PBM properties were defined as categories and analyzed as the results and discussion presented in the following sections.

Table 1 – Interviews, Committee, and Investment Group Meetings

Code	Interview Date	Duration (minutes)	Participants
E1	Dec 11th, 2020	48:20	Alloy's CEO
E2	Dec 14th, 2020	44:49	Alloy's Accelerator Manager
E3	Dec 15th, 2020	53:55	Alloy's Mentor and Investor
E4	Dec 22nd, 2020	31:37	Alloy's customer (a restaurant CEO); Seller side of a platform
E5	Jan 11th, 2021	62:30	Committee Meeting (E5a – Alloy CEO; E5b – Alloy CTO; E5c – Accelerator Manager; E5d – Mentor and Investor; and an E5e – investor from IT sector)
E6	Oct 19th, 2021	16:00	Investment group meeting (E6a – Alloy CEO; investors and accelerator managers)
E7*	Nov 5th, 2021	55:00	Alloy's CEO
E8	Feb 1th, 2022	15:00	Investment group meeting (E6a – Alloy CEO; investors and accelerator managers)

Source: developed by the authors

Notes. *Not recorded.

4 RESULTS

4.1 Alloy in the Pre-COVID-19 (from 2017 to February 2020)

Alloy was founded in 2017 [former Polvo Spot] with the purpose of "creating accessible, powerful and intuitive technologies [...] transforming every business transaction into a lasting relationship between customers and the brands they love"

(Alloy, 2021). In 2019, the startup started to gain attention, being approved in many acceleration programs and receiving more investments. In the early beginning of 2020, they repositioned their brand and became "Alloy," a combination of words that refer to *loy*alty and totality (*all*)**,** which means fusion, coalition, and connection.

Alloy positions itself as a fidelity platform with the primary purpose of helping small entrepreneurs to retain customers and to develop a repurchase strategy. Alloy's CEO (E1) understands that bringing a new customer is more expensive than selling for an existing one. For this reason, the fidelity business model was the right choice for the firm. In one document, Alloy's platform is described as a "complete marketing and loyalty automation solution for physical retailers." This solution encompasses a website, loyalty program, promotions, communications, feedback tools, and reports for each customer. From Alloy's CEO and Accelerator's point of view, the fidelity solution is a less crowded market in Brazil, with lower competition and a big market to be explored.

As stated by its Mentor and Investor (E3), "[...] let say that what catch my attention was that they had the possibility to *scale*, do the business with technology that could be operated in *any moment and any place* [...]". However, Alloy's challenge was to teach the customer to use the solution:

> [...] the [return to scale of the] tool look like high and, how can I say, does not need the presence of a consultor or a mentor, a tutorial could be done, small online videos that the person can learn easily how to use the tool, and then this can scale a lot. (E3-Mentor and Investor).

Besides the possibility to scale, despite the challenges mentioned, Alloy also attracted investors' attention due to founders expertise in the digital market and because they already have revenue. In addition, Alloy's product could not be found in other competitors' applications, at least from the point of view of the Acceleration Manager (E2), that understands that:

> [...] the differentials [is that] they showed a *user-friendly* platform, [...] the use of the tool that was really really simple, very practical to use, was the main difference and also the quantity of, let us say, functionalities,

was also something interesting in their applications.

Accelerator Manager (E2) mentioned that these values apply to sellers and buyers as well. So, before COVID-19, Alloy just had the fidelity platform model. The focus was on physical business, connecting firms (Alloy's direct customers that contract its platform) and those business customers (also platform users). In terms of value proposition, Alloy provides "power" (referring to the knowledge and autonomy) for these businesses to retain current customers, creating a continuous engagement between both, with a user-friendly, easy-to-use, and complete platform. For the buyers (customers of Alloy's direct customers), the value is to provide an intuitive and best purchase and repurchase experience.

4,2 Alloy during COVID-19 (March 2020 to January 2021)

With the emergence of the pandemic in Brazil, the first steps to contain the pandemic were the temporary closing of firms, especially those with face-to-face customer services, such as restaurants, pubs, and many stores. Unfortunately, this caused a breakdown and quickly led to those establishments' permanent closing since they had no revenue to continue operating (Alerigi, 2020).

Alloy's main customers were physical businesses with direct sales to the final consumer, with most customers in small and medium enterprises (SMEs) such as restaurants (food and beverage) and retail store segments. So, the most impacted segments during COVID-19 (Bartik et al., 2020). The impact of COVID-19 on the customer base was felt by Alloy: "[...] we end up losing half of our customer base that closed, broken, or do not have how to operate, cutting costs [...]" (E1-Alloy's CEO).

Running a startup is a learning process, and Alloy just perceived that there is no point in helping SMEs resell to consumers that do not exist anymore. The fidelity solution is useless for a business that does not have consumers and "[...] because the fidelity [solution] is good, for sure, but there are customers that put in the pencil [make the cost/return calculus] and have doubt to offer [prizes] to the consumers" (E2-

Accelerator Manager). So, Alloy decided to develop and offer a delivery solution.

Moving fast, Alloy "[...] already predicting the "alcohol gel" for restaurants and [retail] stores, in February we started to develop and validate, first the [online] model, with an alternative solution and then developing our own model of an online store for gastronomic and retail store businesses." (E1-Alloy's CEO). Nevertheless, this solution did not come from anywhere:

> [...] they [Alloy] already have this [delivery solution] in the roadmap, but not in a hurry, they have other functionalities that they would launch first, but as the lockdown came, they had to change the priority order and advance the delivery solution but was something that maybe would not even be launched in 2020 because they would make other things like POS [point of sale] more focused in the local consumption, and now with the pandemic, they had to change all the backlog to speed the delivery [solution development], and make it in a short time [...]." (E2-Accelerator Manager).

So, in a few months, Alloy adapted its platform to offer an online delivery solution. This solution allows customers (especially restaurants) to create their own website where their buyers can place an order for delivery. Other delivery platforms inspired this, but the main difference is that each business has its own website.

However, the new offer does not come without caveats. Developing a solution with a product-market fit is no simple task, and reaching the customers can take time. Alloy's customer, a Restaurant CEO (E4), contracted Alloy's solution at the beginning of June 2020. Before, he was looking for the Polvo Spot (previous product/service), and 30 or 40 days later, he received a contact from Alloy explaining the new solution, referring to a more complete solution with a website and delivery. Then, Customer (E4) contracted Alloy. This new offer, developed in reason of the COVID-19 crisis, delivered new values to the customer as was perceived by the Customer (E4):

> Well, the first [value] was the speed to place the products to sell online, a solution really fast and extremely cheap. [Alloy's CEO] does not think they are cheap; he thinks that is fair. I think [Alloy is] too cheap because R$ x [nominal financial data ommitted] you to place your website online, it is cheap, it is really cheap, and the second [value] is sincerity.

> They always played it clean, look at this, I cannot do it" [referring to new functionalities and improvements that the customer asks but could not be implemented yet].

This comment is in line with one of the firm's values, "transparency." Customer (E4) experienced other platforms before Alloy's one and said that other platforms have some controls, such as "closing the store" automatically, with no advice to the restaurant when no deliverymen were available. In addition, those other platforms have a huge cost to the sellers since they usually charge commissions per order – which Alloy does not (confirmed by the E2- Accelerator Manager as well) – although they provide a good experience to the buyers. Indeed, Customer (E4) pointed out some improvements that Alloy could make in its platform to improve buyer user experience.

Alloy's new solution creates value for the customer in the context of COVID-19 operating in the same market of "[...] more than 20 million firms in Latin America [...]" (E1-Alloy's CEO). So, asked about the scalability of the business model, Alloy's CEO (E1) affirmed, "[...] today, as we have to sell more, more we have to implement, and more people we need to have inside too" [referring to the need of more employees]. This recognition of the lack of scalability of the new model is known as they perceive that they need to explore new models:

> In the channel model, we can polarize this in a more singular way, and we are working to the next year to self-service where you contract alone, create alone, and we can be more low-touch [...]. Today we are too much high-touch with our customers, then we walk stuck to them [we have too much customization work], but this in relation to scale is hard because the costs increase too much [...] (E1-Alloy's CEO).

This lack of *return to scale* was also emphasized during the Committee meeting: "Today it is not possible to sell for 80 new customers per month because of the development time. If we reach this number, we will need more developers. Today is just [Alloy's developer's name] in the development, and we do not have much agility" (E5a-Alloy CEO at Committee meeting).

The change in the product and the business model again will not come without

friction. According to Alloy's CEO (E1):

> [...] we are looking for a solution to improve our operation to be more low-touch to firms [that contract us] to work in a more independent way that they already have today. The platform gives a lot of autonomy, but [customer] still needs education, education, and commitment. The loss of focus is a problem, something that the retail owner that is concerned with supply, team, customer, energy bills, sometimes understands little [referring to knowing how to implement an online solution on their own].

This new low-touch solution may help Alloy to become scalable again. However, "this thing of self-contract we are making is hidden [not available as an offer yet] because, from our experience, the customer does not know how to make it [implement the solution alone]" (E5a-Alloy CEO). In complement, "This is the world of the customer that does not know how to do these things [implement the solution alone] (E5e). For some SMEs, this change to a low-touch solution may become a friction to contract Alloy's solution because Alloy helped them learn about the solution, and about marketing. Customer (E4) explained that, by implementing Alloy's solution, they could learn about the technology and terms used in the market that they were unaware of. With the COVID-19 crisis, Alloy identified better its customer:

> We had customers without fit, with revenue up to R$ y [nominal financial data ommitted], that do not have money to pay [for the solution]. There were customers paying with their own money [not the firm money]. [Now] our focus is on the customers with revenue higher than R$ y [nominal financial data ommitted] (E5a-Alloy).

In addition, Alloy CEO (E5a) explained during the Committee meeting that they already have a model defined for representative [third parties]. He cited a case with 15 stores in Brasília (Brazil's Capital), where a developer with customers will use Alloy solution and charge their customer for the implementation. This means Alloy can become scalable with a small internal team, but the challenge here is to bring qualified representatives.

4.3 Alloy almost Post-COVID-19 (February 2021 until July 2023)

We followed the Alloy steps until July 14th, 2023, to understand the evolution of the PBM. Alloy's value proposition still focuses on providing a "complete marketing and loyalty automation solution," but they increase the scope. The "one-stop-shop" solution is directed to small and medium enterprises in retail and food areas, including online or not physical businesses.

Alloy perceived a customer's need to have a solution integrated with other platforms. For example, during the pandemic, restaurants had to be present on different platforms such as iFood, Rappi, and UberEats. As a result, it was a challenge to operate and manage orders coming from different sources. Listening to that need, and focusing on the "one-stop-shop" solution strategy, Alloy's developed APIs to integrate these other platforms in their solution where the customers can manage in one place the orders (APIs available at https://ola.meajuda.cc/extras/api-de-integracoes). In addition, they also noticed the need to aggregate other functionalities and integrations to their solution, such as payment solutions. These new functionalities are under development.

As indicated previously, Alloy's challenge was in scale. In this way, Alloy is validating different strategies to overcome this challenge. Besides their own food marketplace platform (https://usealloy.com.br/), Alloy is licensing its solutions to third parties through a Whitelabel model (where Alloy develops the solution, but other companies rebrand it to make it appear as their own). In this model, Alloy has achieved more than 20 partners in operation with ten or more customers each. The partners' profile comprises retail system resellers and developers, logistic firms, and franchisees in the segment. The marketplace solution was also licensed, and currently, there are three marketplaces with 350 registered stores in operation using Alloy's technology.

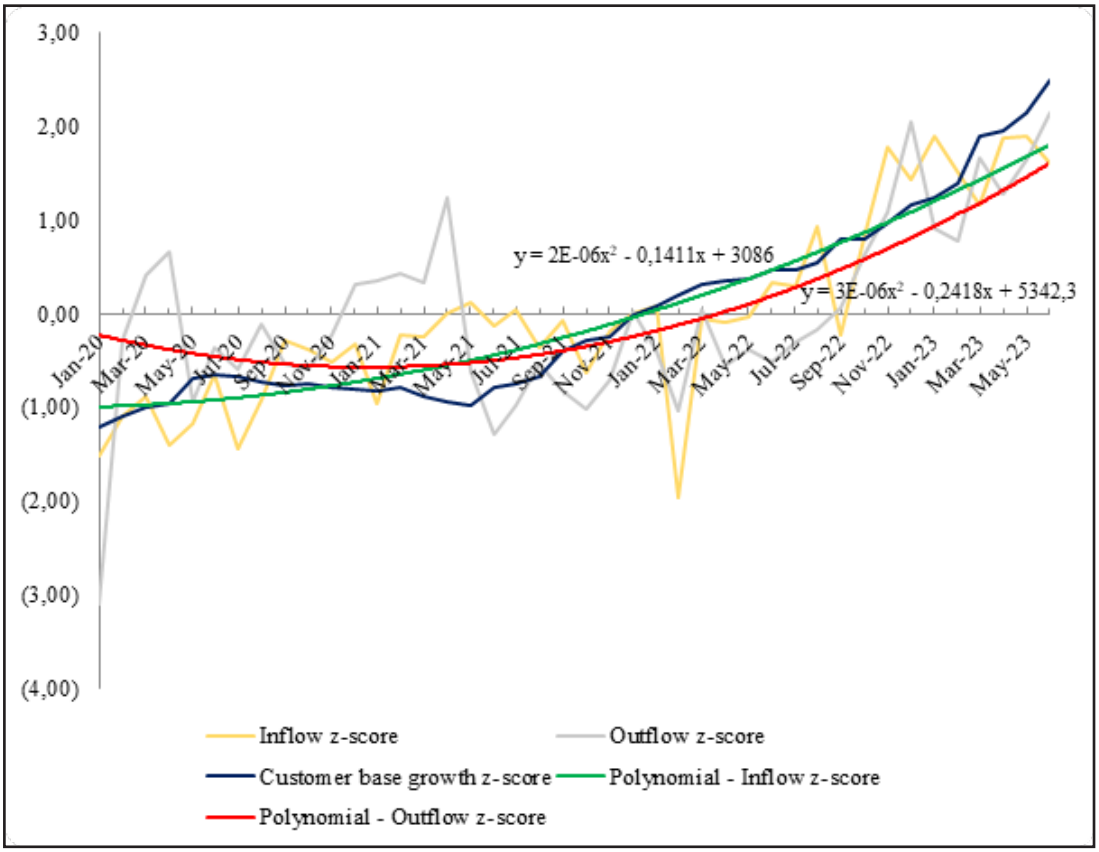
In line with the PBM, Alloy established the third-party partnership model and

marketplaces as the primary growth strategy and increased its direct customer base. According to Alloy CEO (E6a):

> [...] (we should) focus on the license model where we can scale without so much investment. Because they [the partner] invest in sales, support, and marketing, and we invest in supporting them and in technology. Today we see the license channel as the model for traction with a focus on the scale because we can expand to other countries in the next year, with language inversion, without being there.

In our last meeting with Alloy in February of 2022, during the quarter results presentation with Investment group (E8), the company showed that half of the revenue comes from the third-party partnership, while the direct sales do not change. Our data show that Alloy is focusing on using its technology to facilitate third-party partners to implement solutions for their customers and profiting from this connection. This helps to increase the network effect.

Figure 1 – Alloy's Cash Flow and Customer Variation (Jan-2020 up to Jun-2023)



Source: Alloy's data

Despite the COVID-19 crisis, Alloy was able to change its BM and retake customer base and financial growth. Figure 1 shows the cash flow (inflow and outflow) and the variation in customer base from January 2020 to June 2023 [nominal financial data omitted]. We also added the tendency lines with second-order polynomial equations for easier visualization. This period was chosen because it was when Alloy was approved in the acceleration program and changed its name to Alloy (former Polvo Spot). We used a z-score – standard score ($(X- \mu)/\sigma$) – to normalize the data, avoid scale bias, and provide a better data visualization (Hair, Anderson, Babin, & Black, 2010).

The Figure 1 data provide evidence that COVID-19 caused the described impact on Alloy's customer base, which caused the financial drawback (dark blue line after May 2020).

Despite the growing movement, especially after May-21, we can perceive that Alloy does not reach scalability, as the inflow tendency line (Polynomial - Inflow z-score) and outflow tendency line (Polynomial – Outflow z-score) are moving parallel – inflow and outflow are growing in the same rate. To achieve scalability, costs should be stable or reduced while inflow continuously grows.

We highlight that, during COVID-19, Alloy received support from the accelerators in terms of investment to do this business model shift that helped them grow in this period.

5 DISCUSSION - ALLOY'S PLATFORM BUSINESS MODEL CHANGES

PBM creates values mainly through *network externalities* and *returns to scale*, leading to *winner-take-all*, *non-multi-homing scenarios* and attempts to *lock-in* users in the platform. Considering these points, we analyzed Alloy's business model's main changes as a platform before, during, and almost post the COVID-19.

Alloy identified itself as a transaction platform that mediates the interaction between sellers (such as restaurants) and buyers. Alloy's solution provides the

connection of a single customer to their consumer base through different modes. This means that the *network effect*, which is relevant to foster platform *externalities*, will not trigger. Furthermore, we did not identify direct or indirect *network externalities*, where the value increases as the users increase or both sides (buyers and sellers) increase. Consequently, the *network effect* is missed and can affect the *returns to scale*, which is one of the startups' purposes (Pimenta & Lana, 2020).

Since *network effect* and *scale* are not reachable at this moment, Alloy was not in a position of "winner-take-all." There are other solutions that, although they may not be as complete as Alloy's offer, may substitute parts of the startup solution in a more focused way, like other delivery solutions run by big corporations (e.g., UberEATS or iFood), CRM solutions with freemium options (e.g., HubSpot), and competitors in the fidelity model (e.g., Neemo). This conducts to a *multi-homing scenario* with no dominant player and no chance to develop a *lock-in* strategy.

The offer provided by Alloy before and during COVID-19 shifted from a solution based on hybrid face-to-face/online interaction between buyers and sellers to digital interaction. Our document analysis revealed that, during COVID-19, Alloy stated as its purpose to "provide highly personalized digital connections." Both solutions (before and during COVID-19) are software-based, but how they connect the buyers and sellers differs.

Businesses' digitalization is one output of the COVID-19 pandemic (Almeida, Duarte Santos, & Augusto Monteiro, 2020). Even though the VP still focuses on the "loyalty" side, the customers perceive other values such as the delivery solution, low price, and fast to implement. Due to the impact of COVID-19 in segments such as the restaurants that previously operated almost exclusively physically, the fast movement to the delivery model was the new problem to be solved. Indeed, "value creation is maximized when the value propositions are crafted to address the urgent business goals of the stakeholders and leverage the supplier's competitive advantage" (Töytäri & Rajala, 2015, p. 104). In July 2023, Alloy's website had on the first page and at the top the "Digital Menu for delivery" as one of the solutions, and on this solution page, a text

that emphasizes it works "Simple, easy, and fast" to implement and use, reinforcing a value that is relevant for customers.

During the interviews, we realized there was an expectation of scalability in pre-COVID-19, where Alloy started the acceleration process and received investments. In one Committee meeting, we noticed the customer segment was reviewed due to COVID-19. They were continually improving their solutions, reviewing their cost structures and revenue streams to continue growing and achieving scalability, which was impacted by COVID-19. In Alloy's context, scalability is specially measured by increasing revenue without increasing costs. If Alloy can grow revenue without increasing costs in the same proportion, the business model will be scalable.

Also, in Alloy's committee meeting, they discussed that the current business model could not reach scale because each new customer demands time for implementation. This requires a low-touch solution, with little or no time from Alloy's development team allocated to each customer. As stated by Alloy's CEO, "education is one of the most [relevant] competitors." On the other hand, Alloy's attention to their customers, as teaching them how to produce the content, is a value they recognize. This is in the opposite direction of the low-touch strategy.

However, speed is a characteristic of a startup, and nine months after the committee meeting, Alloy was able to implement and validate the partnership with third parties (Whitelabel) stream as the focus to scale the PBM. The development of a low-touch solution is still in Alloy's planning. However, as an innovation platform, it now allows third-party representatives to deliver their brand to their customers using Alloy's solution.

Alloy still needs to find the balance between a low-touch strategy and customer's attention to continue delivering value.

In summary, COVID-19 influenced Alloy's changes in their offer, customer segment, value creation, and capture. However, we realized before COVID-19, Alloy's platform business model had not achieved some characteristics of a platform since it

did not use the network effect to increase value and growth, and there was not a direct approach to connect sellers and buyers as a multi-sided market (Fürstenau, Auschra, Klein, & Gersch, 2019; Hagiu & Wright, 2015).

During COVID-19, the movement to a digital solution increases the chances of success of the platform business model since they could better understand how to leverage the network effect, increase the return to scale, and achieve a winner-take-all, non-multi-homing scenario, and attempt to lock-in users in the platform.

Table 2, 3, and 4 consolidates the changes in the value proposition, value creation, and value capture and opportunities for Alloy to succeed with its BPM:

Table 2 – Alloy's value proposition changes and opportunities to become a plataform

PBM Property	Pre-COVID 19	During COVID-19	Almost Post-COVID-19	Opportunities to succeed as a PBM
VALUE PROPOSITION	- "Empower the local entrepreneur and their business"; - Increase the success rates of SMEs, helping them to attract and retain customers; - Solution described as a marketing and loyalty automation for physical retailers; - In the physical space, an userfriendly, intuitive solution to the buyers; - Focus on the repurchase.	- From the point of view of Alloy, it is still the same, adding a "delivery" solution; - Focus on the first purchase as well (stated by E2); Cheapest options than competitors with similar solutions.	- Engagement and loyalty still is the main focus; - Strategy of providing a "onestop-shop" solution with a complete set of functionalities for the customer's business, including integration with other solutions – even competitors; - Own food marketplace; - Licensing solutions through a Whitelabel model.	- Become a transaction platform (multisided market) and/or an innovation platform (allow third part complementarity).

Source: developed by the authors according to research findings

Table 3 – Alloy's value creation changes and opportunities to become a plataform

Continue...

PBM Property	Pre-COVID 19	During COVID-19	Almost Post-COVID-19	Almost Post-COVID-19
VALUE CREATION				
Network externalities	(Low) - The focus was on increasing one side (sellers) and expecting, indirectly, to increase the other (buyers).	(Low and reduced) - Loss of customers base due to COVID-19; - The focus was on increasing one side (sellers) and expecting, indirectly, to increase the other (buyers).	(from Low to Medium) - Focus is on increasing one side (sellers) and expect, indirectly, increasing the other (buyers); - New focus is to increase the base through licensing solutions, Whitelabel.	- Develop network externalities where an increase in the number of the multi-sides adds value to the platform.
Return to scale	(Medium to High) - They were working to achieve scalability since the implementation was less time-consuming.	(Low) - Scale potential reduced due to COVID-19; - Non-scalable yet; the business model required personalized implementation for each client.	(from Low to Medium) - Alloy found a possible PBM able to scale through the Whitelabel.	- Reduce the friction and costs to implement the solution.
Winner-take-all	- It did not reach this position, but there was no dominant player in the market.	- It did not reach this position, and there are several dominant players in the market.	- It did not reach this position, and there are several dominant players in the market.	- Connect previous and current VPs in a high-value offer and grow fast.

Table 3 – Alloy's value creation changes and opportunities to become a plataform

Conclusion

PBM Property	Pre-COVID 19	During COVID-19	Almost Post-COVID-19	Almost Post-COVID-19
VALUE CREATION				
Multi-homing	- There were many options available for each solution.	- Delivered a highvalue solution that added more value than the competition.	- Delivering a highvalue solution that adds more value than the competition; - Identified the need to add more functionalities;	- Guarantee an offer hard to imitate.
Lock-in	- It was easy to change suppliers.	- Alloy increased change costs to prevent users from finding the same or higher value on other platforms.	- New functionalities planned will increase the costs of change or avoid the user from finding the same or higher value in other platforms.	- Increase the cost of change for customers and users.

Source: developed by the authors according to research findings

As we realized, the COVID-19 crisis led Alloy to an evolutionary business model innovation and focused on what Alloys has under their control: the architecture, offerings and functionalities, and governance. Alloy changed the business model by promoting new ways of value creation and capture and increasing the scope of its value proposition.

However, opportunities emerged to become close to scalability, which we found was one barrier to success as a PBM, along with the network externalities (effects). Considering these two properties, which influence each other's, and may lead to platform success (Thomas Eisenmann et al., 2011), we develop a conceptual model (Figure 2) that we used to explain Alloys PBM innovation and evolution.

Table 4 – Alloy's value capture changes and opportunities to become a plataform

PBM Property	Pre-COVID 19	During COVID-19	Almost Post-COVID-19	Opportunities to succeed as a PBM
VALUE CAPTURE	- They were not able to evaluate since it was starting its business.	- "Delivery" solution was the primary value perceived; fidelity is behind; - Perceived by the customers (sellers) as cheap, fast, and providing a close and differentiated service; - Perceived by the buyers (according to the sellers) as not intuitive, not fast, and lack of payments options – impacting the sellers if the buyers do not use the platform.	- Third-party partnerships can promote scale and enable Alloy to focus on technology development to ensure more value capture for all participants.	- Find a balance between differentiated customer service and scalability; - Focus on the buyers' value proposition and capture as well.

Source: developed by the authors according to research findings

Platforms create value through network externalities as more users increase the value for everyone, same-side or cross-side effect. The business model must be prepared to scale since margins increase as the user base grows. If a firm does not have a business model prepared to do scale that delivers value through network externalities, it will not succeed as a PBM, being on what we call a "Gray Zone" on our conceptual model (Alloy during COVID-19**,** see Figure 2).

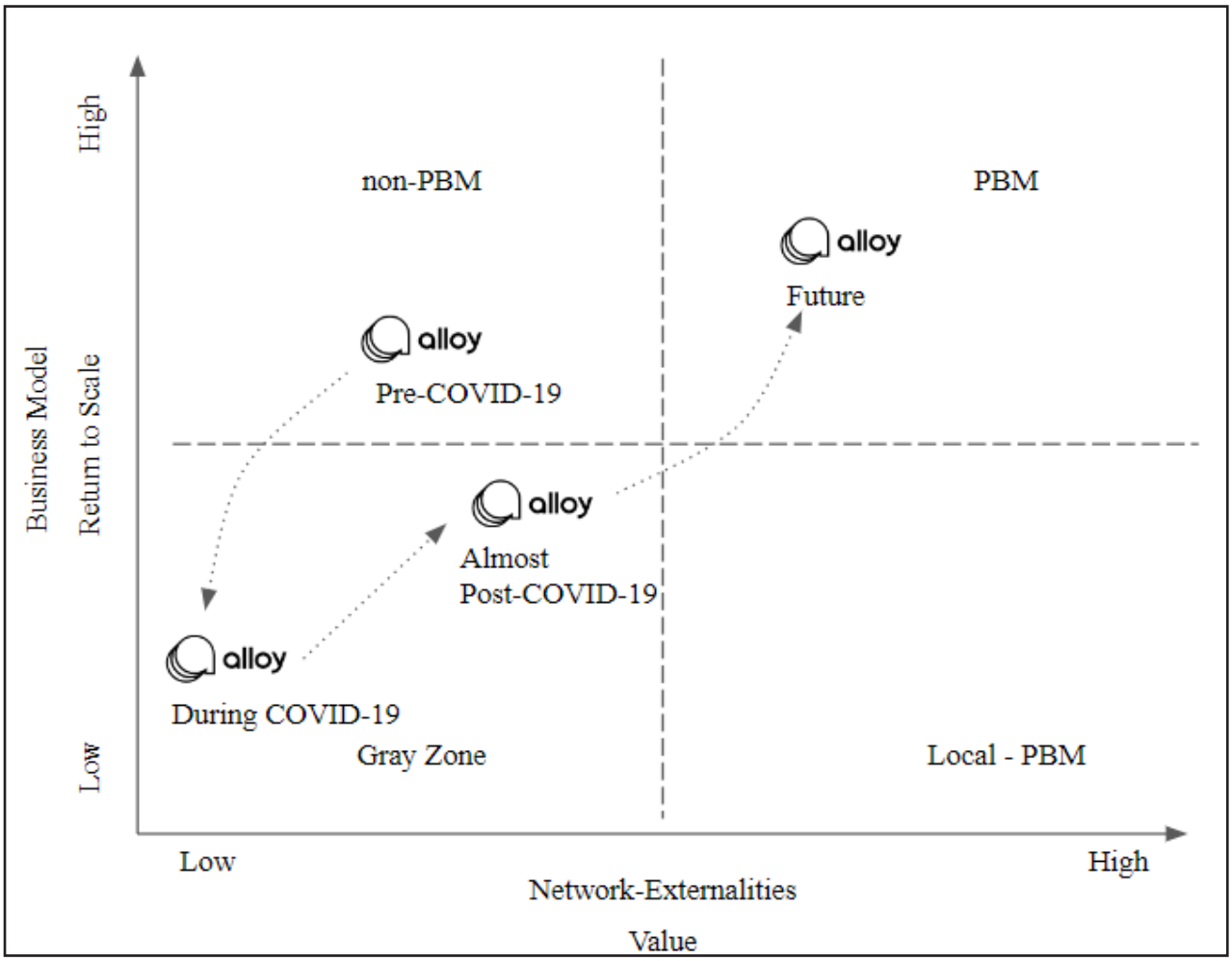
Currently, Alloy has found new strategies to overcome the challenges, improving its network externalities, but not achieving scale yet. If network externalities exist without scale, the firm stays in a local market with a Local-PBM. A Local-PMB happens when a platform dominates a local market, such as a group of users, a community, or a region, while other platforms dominate other groups, communities, or geographical

regions. Using the logic of network effect, new users will choose the option that creates more value, the platform with more participants. In this sense, Alloy still did not move out of this Gray Zone (Alloy's almost Post-COVID-19).

On the contrary, if the network externalities are not the way to deliver value, but the BM can scale, we may have a non-PBM (Alloy Pre-COVID-19). Finally, a firm that delivers value through network externalities and can achieve the return to scale is a PBM (Alloy's potential future) that can achieve success.

Figure 2 presents a conceptual model for these PBM shifts, positioning Alloy in the different moments (Pre-COVID-19, During COVID-19, almost Post-COVID-19 and Future):

Figure 2 – Conceptual model of PBM shifts and Alloy's position in each period



Source: developed by the authors according to research findings

6 CONCLUSION

Our research question investigated "*how has COVID-19 influenced changes in a startup's platform business model?*" Alloy lost its customer base, which affected its scalability, which was growing during pre-COVID-19. By losing scalability, Alloy had to find new ways of creating value. Providing new solutions to a new customer segment, Alloy is increasing its network externalities, which is an opportunity to improve returns to scale. In addition, by improving its solutions, Alloy started to look for lock-in strategies in an environment that had increased the competitors (multi-homing) due to the COVID-19 scenario. While adapting value creation, it affected value capture and value proposition.

Our results showed that Alloy was not successful as a platform until January 2021, according to the definitions of transaction and innovation platforms in terms of value creation, but moving in the PBM direction after this period as we can see in our conceptual model (Figure 2). Still, we were able to evaluate the impact of the COVID-19 crisis on the firm. With the emergence of COVID-19, Alloy's customers have new problems to be solved and changed their focus from loyalty management to the primary concern of selling and delivering. This made Alloy change its solution to an online delivery solution, changing its VP (according to the literature definition). This shift of the offer was not formalized totally in its value proposition but changed (and is still changing) its *value creation and capture*, creating new opportunities for Alloy to succeed with its PBM.

Nine months after the committee meeting, Alloy was able to change the firm's focus to set a plan to achieve scale using a PBM and third-party actors. The main challenge is to become *scalable* since Alloy was still validating its PBM. In addition, the value perceived by the customers (sellers) is created through processes and activities that can affect the scalable strategy. On the other hand, there is space to improve the buyer's perspective to *capture more value* and develop *network externalities*. Scalability's

plan is under construction, and Alloy, its accelerator, mentor, investors, and the committee will need help to validate the new product and business model.

We contribute theoretically to startup and PBM areas in two main ways. First, analyzing a novel and (potential) platform business model changes due to COVID-19, especially its back-and-forth movements between non-PBM and PBM. Second, providing a conceptual model to analyze the firm's position as a PBM, considering the scalability and network externalities. We found that achieving scalability is one of the most significant barriers to becoming a PBM, which is highly connected to network externalities. Changes in the value proposition cause huge impacts on the business model and the value creation and capture. This can help develop further contributions of how firms can achieve the platform status in the face of business model changes. As a managerial contribution, our analysis indicated opportunities to provide inputs for PBM strategies, especially regarding scalability and network externalities, where our conceptual model can also be used.

As research opportunities and considering our findings, we suggest analyzing firms' stages and strategies, such as the startups that aim to build a platform business model. Firms need to go through some steps to achieve scalability and other characteristics until they are defined as a platform. Our conceptual model can help to guide future research on this task.

We encourage other researchers to further validate the conceptual model. For example, researchers can apply the model for the Meta social media Instagram Threads launched in July 2023. According to the model, Threads is a scalable model that heavily relies on the network effect, reaching 30 million users in 24 hours, and 118 million in July 25th, 2023 according Quiver Quantitative (see https://www.quiverquant.com/threadstracker/). At the same time, Meta implemented a lock-in strategy, where a user that decides to delete the Threads will also need to delete the Instagram account.

However, the presence of network effect was not enough to create and deliver value. The Threads peak was on July 7th with 43M active user which dropped to 13M

just two weeks later, and the engagement dropped from 19 minutes to 4 minutes per use (see https://www.deseret.com/2023/7/22/23804132/threads-active-users-tanks-following-explosive-start). This may indicate that the PBM need adjustments to create and deliver value without the risk of loose scale, otherwise it may become a Local – PBM of limited reach and actors. Although our model is used to define a PBM, we encourage further refinement of the model to define PBM success based on scalability and network effect, or other relevant variables.

As limitations of this study, we did not interview other Alloy customers (sellers) or buyers to broaden our perspective or analyze their perceptions of Alloy's original value proposition and solution (before COVID-19). Besides, we explored one single case study, a startup that, although it is in an early stage, already has a business model, customers, and revenue. We invite future researchers to review other scenarios, amplify our contributions, use our conceptual model, and even propose quantitative ways to position the organizations on it.

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3. Development of theoretical propositions (theoretical work)	√	√
4. Theoretical foundation / Literature review	√	√
5. Definition of methodological procedures	√	√
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8. Analysis and interpretation of data	√	√
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