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OPPORTUNITY OR THREAT: A COMPLEMENTORS' PERSPECTIVE ON PLATFORM OWNER'S ACQUISITIONS

Research in Progress

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Abstract

Acquisition of complementors is a prevailing mechanism available to platform owners to leverage digital platforms' multidimensional growth. Notwithstanding platform owners' propensity to acquire complementors, little is known about the potential effects of such acquisitions on the non-acquired complementors. While a group of complementors may benefit from an acquisition, others may perceive an acquisition as the platform owner entering into competition with its own complementors. To address this gap, we examine the acquisition of complementors' effects on the other complementors in the context of a B2B innovation platform whose evolution is considerably influenced by a plethora of acquisitions. As part of an ongoing research project, in this paper we link academic discourses on acquisitions and platform owners' market entry to derive a set of hypotheses, which we plan to test in the respective B2B innovation platform ecosystem.

Keywords: Digital Platform, Platform Ecosystem, Acquisition, Market Entry.

1 Introduction

Digital technologies have facilitated the reorganization of industries around platforms and transformed many firms into either platform operators (i.e., platform owners) or producers of complements (i.e., complementors) in a platform ecosystem (Rietveld and Schilling, 2021). In these complex ecologies of firms, complementors each pursue their own interests and goals, such that platform owners need to incentivize complementors to innovate while aligning the various actors' individual interests and competencies toward obtaining collective objectives (Tiwana et al., 2010; Cennamo and Santaló, 2019). Further, due to fierce inter-platform competition, platform owners also need to facilitate rapid growth and to secure critical resources for their digital platforms (Miric et al., 2021). Since platform owners' proprietary developments are often time-consuming and uncertain (Toppenberg et al., 2016), acquisition of complementors is one of the prevailing options to achieve fast, timely, and multi-faceted growth. Specifically, the acquisition of complementors enables platform owners to lock-in key complementors in the ecosystem and integrate their complements into the platform's core offerings (Miric et al., 2021).

Next to their undeniable potentials, acquisitions also entail risks as they may intervene the ecosystem's internal dynamics. While a group of complementors may benefit from an acquisition (e.g., through additional resources to perform their development work), others may perceive an acquisition as the platform owner entering into competition with them to appropriate a share of their revenue (Foerderer et al., 2018; Li and Agarwal, 2017). The latter specifically applies to the group of complementors that is affected by the acquisition of one of their competing complementors.

While there is surprisingly little research on the effects of acquisitions in platform ecosystems, a research stream on platform owner's entry to its own complementary markets discusses comparable market

interventions. The effects of platform owner's entry on complementors reported in these studies are mixed. Some studies identify positive effects through, for instance, attention spillover effects from increasing customer demand (Foerderer et al., 2018) and others reveal negative effects, for example due to the platform owner increasing the entry frequency (Cennamo et al., 2018a). However, due to acquisitions' specific characteristics and platform owner's distinct motives to conduct acquisition of complementors, it is of value for both research and practice to obtain a coherent understanding of the potential effects of a platform owner's market entry from an acquisition perspective. Therefore, we specify the following research questions: *What are the effects of platform owner's acquisition of complementors on the non-acquired complementors in the platform ecosystem? Do complementors affected by the acquisition of one of their competitors (competing group) react differently than the other complementors (non-competing group)?* To answer these research questions, we plan to conduct a survey among complementors of a B2B innovation platform whose evolution has been considerably influenced by a plethora of acquisitions.

2 Research Background

In this section, we present our conceptualization of platform ecosystems, and introduce the main discourses on platform owners' acquisition of complementors and market entry.

2.1 Platform Ecosystems

Platform ecosystems are complex ecologies of firms with individual and collective, intertwined interests (Cennamo and Santaló, 2019). As the nexus of platform ecosystems, digital platforms are software-based systems that consist of a modular technological architecture and facilitate interactions between different actor groups (Tiwana et al., 2010; Gawer, 2009). Actors of a platform ecosystem include the platform owner (i.e., operator), complementors (e.g., developers), and customers. While each of these actors pursue their own, sometimes conflicting, interests and goals, they also have a common interest in the survival and prosperity of the platform for materializing and consuming their products or services (Selander et al., 2013). Therefore, a platform owner's role as orchestrator of the ecosystem is to align the diverse actors' interests toward obtaining collective objectives.

A platform that is the center of gravity of a platform ecosystem can have different functions (Bonina et al., 2021; Cusumano et al., 2020). A transaction platform (e.g., eBay, Amazon.com) serves as an intermediary for direct exchange or transactions. An innovation platform (e.g., Apple's iOS, Google's Android, Salesforce) serves as a technological foundation upon which external actors develop complementary add-ons and thereby extend the platform's scope of use and functionalities. Both these two fundamental platform functions can facilitate interactions between individuals and/or organizations.

To study the effects of platform owner's acquisition of complementors, our focus is on *business-to-business (B2B) innovation platforms* (e.g., SAP's Business Technology Platform, Salesforce). Existing research highlights that B2B innovation platforms differ in their characteristics compared to consumer-focused innovation platforms (e.g., Apple's iOS, Google's Android) (Matzner et al., 2021; Schrieck et al., 2021; Staub et al., 2021b). For example, owing to the dynamics and complexity of customer requirements, complementors are highly specialized providers of products and/or services that require considerable resource investments (Staub et al., 2021b; Blaschke et al., 2018). This may lead complementors to even more carefully (re)evaluate new resource investments when being exposed to the threat of changing ecosystem dynamics through platform owner's acquisitions (Wen and Zhu, 2019). This indicates that the non-acquired complementors' reactions to platform owner's acquisitions may be distinct in the B2B innovation platform context, making it worthwhile to analyze these effects in the given context.

2.2 Platform Owner's Acquisition of Complementors and Market Entry

Despite platform owners' propensity to acquire complementors, research on acquisitions and their potential effects in the platform context has been scarce (Miric et al., 2021). In general, acquisitions can

help organizations to quickly grow their market share and act as a mechanism to realize synergies with respect to size, geography, assets, people or competencies, thereby creating value (Epstein, 2005). In addition, in the context of digital platform markets, acquisitions specifically enable platform owners to lock-in key third party complementors and flexibly integrate their solutions into the platform's modular core offerings (Miric et al., 2021).

Beyond the advantages for platform owners, acquisitions can also yield important benefits for complementors. For instance, complementors can obtain additional tools for developing their offerings on the platform, such as when Salesforce acquired *Heroku* or Cisco acquired several firms to improve their development environment (Toppenberg et al., 2016; Staub et al., 2021b). On the other hand, acquisitions may intervene within the dynamics of the platform ecosystem. If several complementors are active in a certain market niche (i.e., compete with one another) and the platform owner acquires one of them and deeply integrates that complementor's resources into the platform's core offerings, such an acquisition would erode some of the complementors' incentives to innovate. These complementors may subsequently reduce their development efforts or even leave the platform ecosystem. For example, *Meerkat*, a mobile app that enabled Twitter users to broadcast live video streaming to their followers, vanished after Twitter acquired *Meerkat*'s competitor *Periscope* (Zhu, 2019).

Thus, the complementors affected by acquisition of one of their competitors might perceive such acquisitions as the platform owner entering into competition with its own complementors. This has been conceptualized as the platform owner's market entry in a growing stream of literature in platform research (e.g., Zhu, 2019; Gawer and Henderson, 2007). Platform owner's market entry generally refers to the platform owner entering certain market niches of its own market by imitating complementors with similar offerings to appropriate a share of their revenue (Gawer and Henderson, 2007; Zhu, 2019). While existing studies on market entry highlight acquisitions as an alternative entry mode, they almost entirely focus on proprietary developments. Proprietary developments refer to the addition of a new or the considerable improvement of an existing product and/or service in a market niche through an internal development by the platform owner itself. With reference to different platform contexts, a number of studies on platform owner's entry have examined the impact of entry on complementors and reported mixed results (Table 1).

We acknowledge the importance and necessity of these studies as well as their ability to partially inform the effects of platform owner's acquisitions. Yet, it is worthwhile to consider the platform owner's entry from an acquisition perspective (Zhu, 2019) because acquisitions have important particularities, which do not apply to proprietary developments. Specifically, both the motivation of platform owners to conduct acquisitions as well as the characteristics of acquisitions suggest that entry through acquisition has distinct effects on complementors. Regarding the motivation of the platform owner, acquisitions are often employed opportunistically such as to merely lock-in key complementors after increased competition with other platform owners in a certain market niche or to expand the reach of the platform by increasing the number of participants in one of the platform's actor groups (i.e., complementors or customers) (Miric et al., 2021; Staub et al., 2021a). This may increase complementors' difficulty in assessing when and whether the platform owner enters their market niche through acquisition, which potentially influences their subsequent reactions and strategies. This is intensified by the characteristics of acquisitions such as the high confidentiality requirements that lead the platform owner to conduct acquisitions without providing upfront information to complements. This is in contrast to proprietary developments, which are often communicated by platform owners to complementors as part of complementor enablement programs (Staub et al., 2021b). Moreover, when the platform owner is increasingly conducting acquisitions, certain complementors might start positioning themselves to become attractive acquisition targets (Wen and Zhu, 2019). As such, the effects of platform owner's market entry through acquisitions are expected to differ from the effects of entry through proprietary developments.

We thus aim to complement the studies on platform owner's entry by focusing on entry through acquisitions in a B2B innovation platform context. In this context, complementors are specialized product and/or service providers investing a considerable amount of resources (Ceccagnoli et al., 2012), yet frequently competing with the platform owner. As an acquisition may manifest as entry only for

some of the complementors, we aim to capture the effects on different groups of complementors, i.e., those affected by acquisitions in general and those affected by acquisition of one of their competing complementors in particular.

Reference	Context	Entry mode	Key findings for effects on complementors
Cennamo et al. (2018a)	<ul style="list-style-type: none"> Consumer-focused innovation platform Video gaming 	Proprietary development	Mixed effects: When the platform owner enters a market niche, complementors <i>release more</i> games. When the entry frequency increases, complementors <i>reduce their efforts</i> in producing games but <i>shift their efforts</i> to unaffected niches.
Foerderer et al. (2018)	<ul style="list-style-type: none"> Consumer-focused innovation platform Software development (Google's Android) 	Proprietary development	Positive effects: Google's entry into its photo app market niche <i>increased</i> the customer demand and later also complementors' <i>development efforts</i> (app updates) in that niche, particularly for large complementors.
Li and Agarwal (2017)	<ul style="list-style-type: none"> Consumer-focused innovation platform Social media (Facebook) 	Acquisition	Mixed effects: Facebook's acquisition of Instagram increased the customer demand in its photo app market niche and later <i>positively (negatively)</i> affects the <i>number of large (small) complementor apps</i> .
Wen and Zhu (2019)	<ul style="list-style-type: none"> Consumer-focused innovation platform Software development (Google's Android) 	Proprietary development	Mixed effects: When Google enters a market niche, developers in that niche <i>reduce development efforts</i> in the affected niche and <i>shift their efforts</i> to unaffected niches.
Zhu and Liu (2018)	<ul style="list-style-type: none"> Consumer-focused transaction platform E-commerce (Amazon.com) 	Proprietary development	Negative effects: When Amazon enters a market niche, complementors <i>reduce the number of products</i> that they offer on the platform.

Table 1. Studies on effects of platform owner's market entry¹.

3 Hypothesis Development

In this section, we derive our research model (Figure 1) and its constituent hypotheses based on the digital platform research, specifically on platform owner's acquisitions and market entry. For the derivation of our hypotheses, we also consider the specificities of the B2B innovation platform context.

Although a platform owner's acquisitions can have diverse effects, complementors must still be able to generate innovations (value creation), and by doing so profitably capture a sufficient share of the market (value appropriation) (Cennamo and Santaló, 2019; Oh et al., 2015). Value appropriation concerns a fair *market share of complements* from the platform's total revenue and is a prerequisite for complementors to offer their complements on the platform over time (Zhu and Liu, 2018). As complementors' market share depends on how the revenue generated on the platform is appropriated among the different actors, platform owners need to ensure that complementors receive their fair share in order to maintain their incentives to innovate on the platform (Tiwana, 2014; Oh et al., 2015). As for value creation, each of the complementors contributes to the platform ecosystem's generativity (Cennamo and Santaló, 2019; Zittrain, 2006) by offering their complements. Existing research highlights that platform owners not only need to facilitate the quantity of complements, but also ensure the distribution of complements across heterogeneous market niches (Wareham et al., 2014). This is conceptualized as the *variety of complements*, i.e., the quantity of complements in certain product categories in relation to the quantity of complements in other categories (Wareham et al., 2014). However, the reliance on a plethora of autonomous complementors is not without risk (Wareham et al., 2014; Boudreau, 2012). Where generativity is desirable, uncontrolled creative output is not always positive for the survival and prosperity of the ecosystem (Hagiu and Halaburda, 2009). Stated colloquially, letting a thousand flowers grow (Boudreau, 2012) may produce a flooding of low-quality complements, resulting in a negative

¹ We retrieved these key studies from Zhu's (2019) comprehensive literature review. Other studies included in his review have a different focus (e.g., the motivation of platform owner's entry), therefore we did not include them in our review.

customer experience and lower platform reputation and may even lead to the platform's demise (Wessel et al., 2017). Therefore, another integral aspect to value creation is to control the *quality of complements* (Wareham et al., 2014; Goldbach and Benlian, 2015). Complement quality specifically relates to enhancing the functionality (e.g., improve user interface, add new feature) of complements and enhancing the integrity (e.g., fix bug, ensure compatibility) of complements (Hilbolling et al., 2021).

On this basis, we argue that platform owner's acquisition of complementors leads to different outcomes (i.e., *market share of complements*, *variety of complements*, and *quality of complements*) when comparing the complementors affected by the acquisition of one of their competitors (*competing group*) to the other complementors (*non-competing group*).

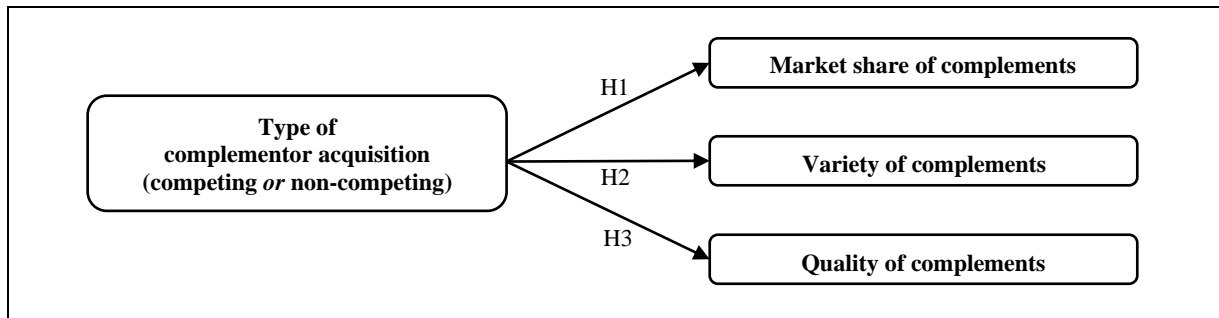


Figure 1. Research model².

3.1 Market Share of Complements

In the literature on platform owners' acquisitions and market entry, no study has systematically analyzed the resulting effects on complementors' market share. However, capturing a bulk of complementors' markets has been discussed as one of the major motivations of platform owners to enter their markets (Zhu and Liu, 2018). Further, existing research highlights that several complementors had to dissolve their companies because they were not able to compete with the entering platform owner (Zhu, 2019). Complementors affected by an acquisition of one of their competitors are likely to interpret market entry as the platform owner's intention to take a share of their revenue, i.e., their market share tends to decrease. This is particularly problematic in the context of B2B innovation platforms, where complementors are usually highly specialized, commercial firms. Therefore, we hypothesize:

H1: A platform owner's acquisition of complementors results in a lower market share of complements of complementors in the competing group compared to complementors in the non-competing group.

3.2 Variety of Complements

The variety of a complementor's innovation output has been conceptualized in the existing literature as the diversification of complements across different market niches (e.g., app categories) (e.g., Cennamo et al., 2018a). For example, in the case of Google's Android, Wen and Zhu (2019) find that once Google enters the market, complementors not only reduce the number of apps in the affected app category but also shift their efforts toward other app categories, which had not been affected by platform owner's entry. Similarly, in the video gaming industry, frequent releases of first-party games by the platform owner in a market niche drives complementors away from that genre to other genres (Cennamo et al., 2018a). In other words, complementors increase the diversification (variety) of their offerings. Due to the considerable resource investments of complementors in the B2B innovation platform context, we

² In general, a complementor can be affected by both types of complementor acquisitions. As we expect a higher number of complementors affected by the non-competing type of complementor acquisition, we intend to ask the complementors affected by both types to only report their experienced effects related to the competing type of complementor acquisition.

expect complementors affected by platform owner's acquisitions to shift their development efforts rather than exiting the platform ecosystem. Therefore, we hypothesize:

H2: A platform owner's acquisition of complementors results in a higher variety of complements of complementors in the competing group compared to complementors in the non-competing group.

3.3 Quality of Complements

Cennamo et al. (2018a) show that in video gaming platforms, platform owner's entry can have negative implications on the quality of the complements in the platform ecosystem, specifically in the case of a high entry frequency (i.e., several entries of the platform owner in the same market niche). In addition, research highlights that, compared to complementary apps, the products and services developed or acquired by the platform owner are often of superior quality because platform owners have full access to the platform's technical details, enabling the owners to build products and services that are more platform-compatible (Wen and Zhu, 2019). This, in turn, reduces the probability that complementors will make new resource investments to improve the quality of their complements. Therefore, in the context of B2B innovation platforms, where complementors are required to make substantial platform-specific investments, we hypothesize:

H3: A platform owner's acquisition of complementors results in a lower quality of complements of complementors in the competing group compared to complementors in the non-competing group.

4 Research Method

To test our hypotheses, we plan to conduct a survey among complementors of a B2B innovation platform. A survey research design specifically enables us to collect data from a large number of complementors whose complements were affected by platform owner's acquisitions. In doing so, we intend to focus on Salesforce, a leader in the global enterprise software market and a prime example of a thriving B2B innovation platform whose evolution is considerably influenced by a plethora of acquisitions. In the following, we briefly describe the context of our research, the data collection, and the planned analysis procedure.

Salesforce's main offerings are advertised as *Customer 360* with different core modules related to sales, customer service, marketing, and e-commerce. To enable complementors to build complementary apps, Salesforce launched a development environment called *Force.com* (i.e., its B2B innovation platform) to enable complementors to produce their own apps. Until today, Salesforce has attracted more than one million registered developers and more than 3,500 enterprise apps are currently offered on Salesforce's marketplace (*AppExchange*). Salesforce's evolution to a leading platform ecosystem in the enterprise software industry has been considerably influenced by the platform owner's more than 60 acquisitions³. Several of these acquisitions have been leading complementors in the Salesforce platform ecosystem, such as *Vlocity* (a provider of industry-specific software solutions), *ExactTarget* (a provider of marketing automation and campaign management software), or *Evergage* (a provider of omnichannel personalization and customer experience software).

We plan to collect data on each of the constructs included in our research model (Figure 1). There is no study that applies a survey approach to analyze the effects of a platform owner's acquisitions on complementors from which measurement items for our model's constructs could be adopted. Therefore, building on existing research and following MacKenzie et al.'s (2011) guidelines, we derived and produced measurement items for our three constructs, namely the market share (Oh et al., 2015; Cennamo and Santaló, 2019) as well as variety (Wareham et al., 2014; Boudreau, 2012) and quality (Cennamo and Santaló, 2019; Wareham et al., 2014) of complements. While the unit of analysis is the complements, through analyzing the implications of platform owner's acquisition on complements we aim to capture the complementors' perspective and to eventually provide insights tailored to both

³ For a full list of acquisitions, see Salesforce's *Wikipedia* entry: <https://en.wikipedia.org/wiki/Salesforce#Acquisitions>

platform owners and complementors. Besides the main constructs, we included several control variables to account for alternative explanations such as complementors' years of experience in app development and in the Salesforce platform ecosystem, and number of apps in the Salesforce platform ecosystem. Further, we collect data on additional variables that may have a moderating effect based on the existing research such as complementors' defense mechanisms to platform owner entry, i.e., intellectual property rights and downstream mechanisms (Ceccagnoli et al., 2012) as well as multihoming of complementors in several competing platform ecosystems (Cennamo et al., 2018b). This will give us the possibility to assess the impact of these variables on the differences between the two groups (i.e., *competing group* and *non-competing group*).

To ensure that our survey questions are relevant and clear for the target audience, we conducted a two-step pre-test before distributing the survey. First, we invited four researchers, who are highly knowledgeable in the field of platform ecosystems, to go through the survey and provide comments in a feedback template. Subsequently, we discussed open points with each of the researchers to ensure that the measurement items are mutually exclusive and collectively exhaustive for each of our constructs. In the second step, we distributed our survey questions and feedback template in an internal forum for Salesforce architects, who have an in-depth understanding of the complementors' perspective on Salesforce's acquisitions. Similar to the first step, we had follow-up discussions with Salesforce architects to clarify open points. The latter step enabled us to ensure that the survey questions are understandable from the perspective of the target audience.

Once a sufficient amount of data is collected, we will assess content validity, convergent validity, and discriminant validity for each of the constructs and measurement items (Pinsonneault and Kraemer, 1993; MacKenzie et al., 2011). Regarding the analysis and considering the design of the research model, our objective is not to test cause-and-effect relations. Instead, we intend to perform a one-way analysis of variance (ANOVA) to test the differences between the two types of complementors, i.e., the *competing group* and *non-competing group*.

5 Discussion and Next Steps

Digital platforms have gained significant interest in research and practice due to their transformative power across industries. One considerable gap in the existing research is the lack of insights on the effects of platform owner's acquisition of complementors, particularly in a B2B innovation platform context. In this study, we posit that acquisition of complementors causes diverging effects on the non-acquired complementors affected by acquisition of one of their competitors (*competing group*) compared to the other non-acquired complementors (*non-competing group*).

This study is part of an ongoing research project on the Salesforce platform ecosystem. We have already conducted case studies on the topics of platform ecosystem evolution as well as acquisitions as a strategy for platform owners (Staub et al., 2021a; Staub et al., 2021b), which provided us with a sound understanding of the Salesforce environment. Specifically, the initial discussions with complementors during our recent interview series indicated that the two groups of complementors experienced acquisitions in different ways. The latter, along with the outlined void in the extant research, served as the motivation to seek for answers to the research questions reported in the paper at hand. At this stage of the research, we believe that a survey approach is suitable to collect data from a relatively large number of complementors on their experience with the platform owner's acquisitions. At a later stage, conducting interviews with a selected number of complementors would supplement and contextualize the survey results, and eventually provide complementary insights.

Although our research is still in progress, it provides a preliminary contribution in its current state subject to further research. Our study's current contribution lies in connecting academic discourse on two important topics that have been mainly analyzed in isolation, namely the acquisitions and the market entry of platform owners. Specifically, with reference to the literature on platform owner's entry and from the complementors' perspective, we derived three major constructs that may potentially be influenced by platform owner's acquisitions. Therefore, these constructs may require the specific attention of platform owners when conducting their acquisitions. To the best of our knowledge, such a

study would be the first to analyze the effects of platform owner's acquisitions on complementors, specifically in a B2B innovation platform context.

After analyzing the data, we expect three further contributions of our study. First, we expect insights into the effects of platform owner's acquisition of complementors on the non-acquired complementors. We specifically aim to contribute to a more coherent understanding of the effects on each of the three constructs in our research model (Figure 1). These insights will support platform owners by illustrating what are the main subjects of impact from the complementors' perspective that need to be considered when evaluating potential acquisitions. Second, we expect insights into the diverging effects of platform owner's acquisitions on the two groups of complementors (i.e., the *competing group* and the *non-competing group*). These insights will support platform owners in moderating potential negative effects of their acquisitions as well as in balancing their own interests and those of their diverse complementors. If it turns out that there are no significant differences in the effects on the two groups of complementors, our research will support platform owners with empirical evidence that acquisitions can be pursued even more aggressively. Third, we expect to contribute to the literature on platform owner's entry from the perspective of acquisition as an entry mode. Specifically, we aim to contribute on how platform owners can evaluate the application of different entry strategies (e.g., acquisition vs. proprietary development). In this regard, our study may further contribute to platform owners' decision-making processes when defining which products or services can or should be provided by the platform owner and which ones should be left to complementors to ensure their incentives to innovate on the platform. Similarly, complementors can benefit from understanding the effects of platform owners' acquisitions, specifically in terms of their strategic positioning and competitive moves in platform ecosystems.

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