

Research on the Growth Path of New Ventures in the Digital Ecosystem

-- A Fuzzy-set QCA Approach

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Abstract

The growth of new ventures is a hot topic in entrepreneurship research. In recent years, the sudden emergence of new ventures in the digital ecosystem has attracted the attention of scholars. This study adopts the method of qualitative comparative analysis of fuzzy sets, and selects five types of resource diversity, resource complementarity, resource arrangement, dynamic capability, and entrepreneurial orientation. From the perspective of configuration, how can new start-ups in the digital ecosystem achieve high-quality corporate growth? This paper uses the fuzzy set qualitative comparative analysis (fsQCA) method to conduct an overall analysis and induction, and identifies one high-growth path and two non-high-growth paths. Further analysis found that only when resources such as resource diversity and resource complementarity are combined and matched in an appropriate way, new ventures can achieve higher growth performance. The research results have important practical implications for improving the growth of new ventures.

Keywords

Start-up Growth; Digital Ecosystem; Fuzzy Set Qualitative Comparative Analysis (Fsqca).

1. Introduction

Under the call of "mass entrepreneurship and innovation", especially in recent years, my country's entrepreneurial activities are in the ascendant, and many new ventures have sprung up like mushrooms after a rain. The "Global Entrepreneurship Monitor (GEM) 2017/2018 China Report" released on November 16, 2018 shows that the quality of China's entrepreneurship is gradually improving, but there is still a certain gap with the developed countries in the G20 economies. What deserves our attention is that due to the inherent lack of resources, new start-ups have to face difficult survival problems in the process of fierce competition. The mortality rate also hit entrepreneurs hard. Since new ventures are the main force in the development of emerging economies, their survival and development have received in-depth attention from many researchers. Compared with more mature enterprises, disadvantages such as lack of legitimacy, short establishment time and other self-generated "new entrant defects" (Wiklund et al., 2010) and higher cost of obtaining resources from outside will all give rise to disadvantages. The survival and development of new ventures bring certain challenges, and the constraints on resources are also more prominent. Resource is an important cornerstone of enterprise development, and its significance to the enterprise is obvious. From the perspective of resource-based view, scarce, valuable, irreplaceable and difficult to imitate resources can obtain competitive advantages for enterprises. For start-ups that are generally faced with the dilemma of "small" and "new", promoting their own growth through an outward-looking digital ecosystem has become a common choice for new start-ups.

Compared with ordinary new start-ups, startups in business parks, industrial parks and incubation bases will have higher growth performance, reflecting the increasingly obvious role of ecosystems in helping startups grow and regional economic development. Existing research demonstrates that the elements of a successful digital ecosystem will enable capable entrepreneurs to identify and leverage local resources, funding, and other support to grow their new ventures (Adner and Kapoor, 2010; Ceccagnoli et al., 2012). The "non-universal complementarity" of the ecosystem attracts a large number of interdependent enterprises to join, and the interaction between enterprises and ecosystem members promotes the horizontal spillover of knowledge, enabling new start-ups to obtain various resources from the ecosystem. complementary resources. Build a digital ecosystem to provide a good environment for innovation and entrepreneurship to meet the needs of new ventures. In both emerging and developed economies, digital ecosystems are the organizational force that generates and sustains entrepreneurial activities (Roundy, 2019), Digital Ecosystems The effectiveness of digital ecosystems is critical to economic development and growth (Freitas and Kitson, 2018), and how to leverage the digital ecosystem to achieve high growth of new ventures is an increasing focus of government policymaking.

2. Literature Review and Framework Construction

Resource-based View points out that focusing on resources is the logical starting point for enterprises to make strategic choices, and emphasizes that enterprises relying on heterogeneous resources, knowledge and capabilities to build resource location barriers is the key to explaining the high profits of enterprises. However, the traditional resource-based view overemphasizes the importance of heterogeneous resources owned by enterprises for building core capabilities and competitive advantages, but ignores the formation and evolution of resources and how to acquire and allocate key resources to enhance corporate capabilities and shape competitive advantages. in-depth discussion. In view of the shortcomings of traditional resource-based theory that it is difficult to clearly explain the specific mechanism between an organization's resource stock and capacity building, the resource arrangement theory focuses on the organization's effective actions on internal and external resources to establish a resource action view.

Resource orchestration refers to the resource utilization behavior in which the enterprise selectively develops resources on the basis of obtaining resources through a series of policy measures, and then adjusts the enterprise capabilities according to the applicability of resources, and finally realizes the resource utilization behavior of resources in the enterprise to achieve the desired value effect. Its purpose is to rely on the acquisition, processing and processing of resources to achieve their maximum use value. New ventures generally have the dilemma of being "small" and "new". More than mature companies, managers need to arrange resources flexibly to ensure that resources are used effectively and efficiently. Resource allocation has become one of the theories to explain the growth of new ventures (Wright et al. al., 2012). Existing research mainly involves the matching of orchestration actions and organizational capabilities of new ventures (Wales et al., 2013), the law of resource orchestration in the context of portfolio entrepreneurship (Baert et al., 2016), and the evolution path of resource orchestration (Su Jingqin et al., 2017). Sirma et al. (2011) proceeded from the depth and breadth of resource orchestration, expounding that resource orchestration behavior is affected by the enterprise life cycle, external environment and management level. Resources are the basis of capability generation. Capability originates from the integration and application of resources and is also the direction of resource evolution. Under the action of managers' capabilities, the two act together to improve corporate performance through resource actions. Yang Xu and Li Runmao (2022) elaborated the impact of resource arrangement on the growth

of new ventures from the perspective of dynamic capabilities, reflecting the interaction between organizational capabilities and behaviors. The survival and development of an enterprise is closely related to the environment, and resource action is not an isolated practice, but the result of interaction with the resource environment. Regarding the impact of the external environment on resource behavior, existing research mainly focuses on the environment uncertainty and environmental generosity that enterprises take different resource actions to create higher value (Sirmon et al., 2007). Deng Yu (2020) explored the relationship between the complementarity of alliance resource diversity and enterprise performance based on the resource arrangement theory, and studied the moderating effect of entrepreneurial orientation. Most previous studies on the growth of new ventures from the perspective of resource orchestration are limited to single or paired interpretations of resource context, resource action, and organizational characteristics, and only depend on a single environmental condition, even if resource diversity and resource action research based on alliance contexts, also lacks a configurational explanation that matches the causal complexity between resource context, resource actions, organizational characteristics, and new venture growth.

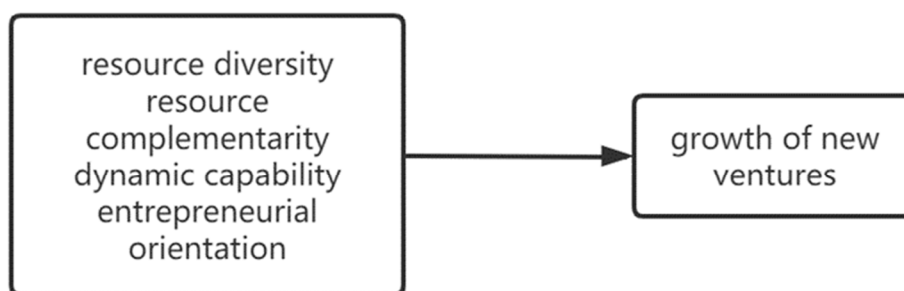


Figure 1. Research framework

Diversity of resources. Existing studies on resource diversity have diverged, and there are opposite conclusions about the impact of resource diversity on firm performance. Some scholars focus on the research situation of alliance combination, and believe that the resources that enterprises can acquire and occupy are more abundant and diverse to promote enterprise performance. The resource-based view is the main theoretical basis to support the above view, that is, enterprises can obtain resources through foreign alliances, and possession of valuable resources is a decisive factor for enterprises to obtain competitive advantages (Barney, 1991). Some studies believe that alliance combination can help enterprises obtain diverse resources, information and even capabilities at a lower cost, and diversity itself is beneficial, which is also in line with the basic logic of the resource-based view and the knowledge-based view (Baum et al., 2000; Wassmer, 2010); while another part of the research highlights that diversity may also increase costs, including coordination costs and more complex resource management processes, thereby making diversity important for alliance relationships (Deken et al., 2018), corporate strategy Decision-making (Lee, 2017) has a negative impact, and ultimately damages corporate performance (Goerzen, 2007). Transaction cost theory is the main theoretical basis for the above views. Reasonable resource management behavior can weaken the negative impact of resource diversity on entrepreneurial enterprise performance (Deng Yu, 2021), and the role of resource mobilization and resource coordination behavior in the context of alliance combination is further amplified. Doing the right thing right is all the more necessary due to the unique nature of the resource needs of new startups and the constraints of their capabilities.

Entrepreneurial orientation is helpful for new start-ups to choose appropriate resources from diverse resources and take effective actions.

resource complementarity. Jacobides et al. (2018) pointed out that an ecosystem is composed of a set of actors with varying degrees of multilateral, non-universal complementarity relationships that are not controlled by hierarchies, and distinguishes between non-universal complementarities among ecosystem actors. There are two types: unique and supermodular, the former refers to the interdependence between participants that "one element cannot function without the existence of another element" through co-specialization, and the latter refers to a certain participant. A 'reinforcing' type of interdependence, in which two actors derive greater value from the additional availability of their complements, meaning that the presence of one element (product, asset, or activity) increases the value of other related elements. Both of these complementarities underscore the synergies and systemic effects that result from the fit and coordination of elements. A company's assets are strategically aligned with its ecosystem, which allows the company to acquire more resources. Complementarity needs to be continuously managed (and reconfigured when necessary) to achieve evolutionary fitness, for example by limiting value loss when market conditions shift in favor of external complementarity. In an emerging industry with competing technologies, entrants are more likely to pursue the technology path with the least resistance to commercialization (i.e., technologies with complementary assets in the ecosystem). Such a path allows entrants to reduce their commercialization challenges and take advantage of opportunities in the growing industry. The availability of complementary assets has a significant impact on firm entry and higher performance. However, some scholars pointed out that when the two parties have more complementary resources, the two parties are not familiar with each other's business, which will result in higher communication costs and larger workload during cooperation, making it more difficult for new start-ups to integrate into the ecosystem. The complementarity of resources provided by the digital ecosystem will affect the resource management behavior of new start-ups. When the complementarity of resources is too high, it is not necessarily conducive to the integration and utilization of resources by enterprises.

Entrepreneurial orientation. Entrepreneurial orientation is the core concept that reflects the strategic direction of an enterprise. It points out the direction for the behavior of the enterprise, and to a certain extent expresses the response of entrepreneurs and managers to the environment and changes. A higher entrepreneurial orientation means that the enterprise has shown positive entrepreneurial spirit in three aspects: innovation, proactiveness and risk-taking. Based on this, this paper makes an academic judgment that entrepreneurial orientation will have an important impact on the process of enterprise resource utilization. In the process of resource planning, entrepreneurial orientation provides a vision and direction for the resource mobilization of the enterprise. Specifically, by guiding the use of resources, entrepreneurial orientation not only further clarifies the strategic goals of the enterprise, but also helps determine the resources needed to support the strategic goals. It improves the matching degree between strategies and specific resources; for start-ups, it means that the strategic goals are clearer and clearer, and the implementation of innovation-oriented strategic measures is more in place. Diverse and complementary resources provide potential support for entrepreneurial strategies and initiatives of entrepreneurial enterprises (Yi et al., 2016); at the same time, the unique resource requirements and limited resource management capabilities of entrepreneurial enterprises make it difficult to fully utilize diverse resources advantage and even suffer from it. At this time, entrepreneurial orientation helps to play a role in the above two aspects and weakens the negative impact of resource diversity on entrepreneurial enterprise performance: From the perspective of resource and strategy matching, entrepreneurial enterprises emphasize innovation orientation, focusing on new products or The development of new services is often regarded as a unique label for entrepreneurial

enterprises, and the corresponding requirements are focused on matching resources, which puts forward higher requirements for entrepreneurs and managers of entrepreneurial enterprises, which is mainly reflected in the selection of effective resources. and control, when the level of entrepreneurial orientation of an enterprise is higher, higher innovation means that the strategic thinking of enterprise innovation orientation is clearer.

Resource orchestration. Resource-based theory and emphasizing that enterprises rely on heterogeneous resources, knowledge and capabilities to build resource location barriers is the key to explaining the high profits of enterprises. The traditional resource-based view overemphasizes the importance of heterogeneous resources possessed by enterprises in building core competencies and competitive advantages, but neglects the process of resource formation and evolution and how to acquire and allocate key resources to enhance enterprise capabilities and shape competitive advantages. discuss in depth. With the complex and changeable external environment, all kinds of enterprises have begun to break through their own boundaries and integrate and use internal and external resources to synergistically build an innovation network to achieve mutual benefit and win-win results for multiple subjects. In order to establish a more universal resource action theory to guide cross-border resource management actions in the entire life cycle of an enterprise in general situations, Sirmon et al. proposed a resource management model, pointing out that enterprise resource management is the integration of resource upgrade capabilities after building resource combinations and then orchestrating. The integrated process of resources and capabilities to create value. In order to further clarify the internal relationship between resources and capabilities and open the process black box from resource allocation to sustainable competitive advantage acquisition, Sirmon integrates the process thinking of "resource management" and the collaborative thinking of "asset orchestration" on the basis of dynamic capabilities and continues to propose the theory of resource orchestration (Resource Orchestration). This theory believes that dynamic changes such as emergencies, industrial structures and boundaries will increase environmental uncertainty and thus change the interaction between resources, capabilities, and strategies. It is pointed out that in the process of resource arrangement, enterprises should take three types of actions: structuring, bundling and utilizing resources to activate resources, that is, to achieve resource combination structure through cross-border acquisition, accumulation and stripping, relying on various levels to maintain and enrich existing resources and develop and create new resources. Behaviors bundle resources to build capabilities, and finally use capabilities to create value through mobilization, coordination, and deployment.

3. Research Design

3.1. Research Method

Most literature studies on factors affecting entrepreneurial activity or the activity of early entrepreneurial activities are mostly based on regression analysis methods, which only reflect how a single factor affects the results. The QCA (Qualitative Comparative Analysis) research method is different from the atomic perspective used in traditional regression analysis, and focuses on the "configuration perspective" analysis (Du Yunzhou, Jia Liangding, 2017), and studies the results caused by multi-factor sets. The principle is to analyze the set relationship between the condition set and the result set of the case based on the idea of set theory. The specific process is reflected in the calibration of the research object according to the theoretical research or practice selection calibration standard of a certain predecessor, and the research conditions and result variables are calibrated as cases. The ensemble membership of , and then analyze the sufficiency and necessity of the combination of conditions to the results, revealing the complex problems of multi-factor effect results.

fsQCA (fuzzy-set Qualitative Comparative Analysis) is a kind of QCA method. The reasons for choosing the fsQCA research method are as follows: (1) Focusing on the analysis of configuration effects from a holistic perspective, avoiding that when the independent variables are correlated with each other, the results of a single variable will mask the joint effects of related variables. (2) Many causal problems are symmetric problems, and QCA can well explain the asymmetric problems of causality, which is reflected in the research of high and low levels of new venture growth. (3) The fsQCA research method has unique advantages compared with other QCA methods, that is, fsQCA can study continuous variables, not limited to limited variable measurement, and can analyze and process qualitative data and simplify by converting fuzzy set data into truth table. configuration, so that it has the dual properties of qualitative and quantitative analysis. This paper adopts this method to explore how China's new ventures can form high-level enterprise growth, selecting resource diversity (ZYDYX), resource complementarity (ZYHBX), resource orchestration (ZYBP), dynamic capability (DTNL) and entrepreneurial orientation (CYDX) five How factors are interconnected and work together to grow a business.

3.2. Samples and Data

The purpose of this study is to explore different paths for the growth of new ventures in different digital ecosystem contexts. The research content involves core corporate information such as corporate entrepreneurial orientation, resource context, and performance. At the same time, the setting of items is mostly subjective evaluation. Therefore, this paper selects Most of the respondents were corporate CEOs or executives. At the same time, in order to highlight the differences of sample cases to the greatest extent, this paper selects 10 cities in Hangzhou, Jiaxing, Haining and Lishui for investigation. The accreditation review results of 2019 (2019) selected digital ecosystems at different levels such as national, provincial, and municipal levels. In each digital ecosystem, according to the introduction of the park management, both excellent companies were interviewed, and companies with relatively poor performance were also investigated. At the same time, differences are also reflected in the industry attributes, scale, and development stages of enterprises, and cases of different enterprise forms are included as much as possible.

Table 1. Calibration anchors for outcomes and antecedents

research variables		fully affiliated /%	intersection /%	not affiliated at all /%
outcome variable	business growth(YSHJ)	86.24	74.68	70.6675
condition variable	resource diversity(ZYDYX)	91.2475	73.31	64.92
	resource complementarity(ZYHBX)	87.345	76.17	65.915
	resource orchestration(ZYBP)	89.42	81.04	79.1225
	dynamic capability(DTNL)	87.7225	77.34	68.7525
	entrepreneurial orientation(CYDX)	91.155	70.85	63.915

3.3. Calibration

Due to the lack of a fixed value corresponding to each membership degree provided by previous literature, the research uses the quartile method to determine the calibration anchor point of each data, that is, more than 0.95 is full membership, 0.5 to 0.95 is relatively membership, and 0.05 to 0.5 is relatively unaffected. Affiliation, below 0.05 is not affiliated at all. The tool is Excel, and its formula for calculating quantiles (=PERCENTIL (array, k)) determines the critical value

of each data, and adds or subtracts 0.01 to the cross value in order to avoid the cross value being ignored. The results are shown in Table 2. Then use fsQCA3.0 software to assign the set membership from 0 to 1 according to the calibration anchor point. The degree of activity of early entrepreneurial activities is mainly judged according to the calibration results, that is, the growth score of new ventures is 74.68, which means high-level enterprise growth, and the membership degree is 0.5.

Table 2. Necessity analysis results

Antecedent condition	Consistency	Coverage	Antecedent condition	Consistency	Coverage
ZYDYX	0.807155	0.939493	~ZYBP	0.579094	0.479168
~ZYDYX	0.499721	0.433349	DTNL	0.820011	0.829282
ZYHBX	0.717719	0.850331	~DTNL	0.515372	0.503550
~ZYHBX	0.565679	0.484211	CYDX	0.869201	0.915783
ZYBP	0.699832	0.870654	~CYDX	0.485746	0.456887

3.4. Sufficiency Analysis of Configuration

Sufficiency analysis refers to detecting whether each antecedent condition is a subset of the result set. The critical value involved in the analysis process is different from that of necessity analysis. In the existing literature, it is believed that the consistency of sufficiency must reach 0.75 to be convincing. When setting the consistency threshold, in order to keep the results that both 0 and 1 exist and are roughly balanced, the study sets the consistency threshold to 0.8. In the selection of the frequency threshold, since the number of samples in the study is 33, which belongs to small and medium samples, it is set to 1. And at least 75% of the cases should be included in the sufficiency analysis (Du Yunzhou, Jia Liangding, 2017), which meets the required benchmark. The analysis results show three types of solutions in the software fsQCA3.0: complex solution (excluding logical remainders), intermediate solutions (including some logical remainders in line with theory and practice), and parsimonious solutions (including logical remainders). The analysis process involves an intermediate solution and a parsimonious solution. The conditions contained in the parsimonious solution also appear in the intermediate solution, which are core conditions, otherwise they are marginal conditions. The results are displayed in the intermediate solution, supplemented by the parsimonious solution. The truth table results are shown in Table 3.

Table 3. The truth table

Antecedent condition	Untie					
	1a	1b	1c	2a	2b	3
ZYDYX	⊗	●	●	●	⊗	⊗
ZYHBX	⊗	●		●	●	●
ZYBP	⊗	⊗	●	●	⊗	●
DTNL			●	●	●	⊗
CYDX	●	●	●		⊗	⊗
Consistency	0.9654	0.9357	0.9249	0.9190	0.9569	0.8678
Original coverage	0.5696	0.7880	0.8080	0.8154	0.676009	0.2272
Unique coverage	0.0184	0.0198	0.0308	0.0380	0.002331	0.0257
Consistency of the overall solution	0.8858					
Overall solution coverage	0.9165					

Note: ● means having core conditions, ● means possessing edge conditions, ⊗ means lacking core conditions, ⊗ means lacking edge conditions, blank means can exist or not exist

The results show that the consistency level of both the single solution and the overall solution is higher than the required minimum benchmark level of 0.75, of which the consistency of the overall solution is 0.8543, and the coverage ratio of the overall solution is 0.8916. A total of six combinations of antecedents can lead to the growth of high-quality new ventures. In configuration 1a (\sim ZYDYX* \sim ZYHBX* \sim ZYBP*CYDX), the existence of entrepreneurial orientation is the core condition, and the lack of resource diversity, resource complementarity and resource arrangement are marginal conditions, and dynamic capabilities can exist or be absent, reflecting entrepreneurial The importance of orientation and the degree of innovation of new ventures are crucial to the growth of new ventures. For example, Silicon Valley in the United States and Hangzhou in China are all new startups with strong innovation, which are very attractive for enterprises to do business. Configuration 1b (ZYDYX*ZYHBX*ZYBP*DTNL) has the same core conditions and has entrepreneurial orientation, but has resource diversity and resource complementarity and lacks the edge conditions for resource orchestration. The consistency of the path reaches 1, indicating that when there is entrepreneurial orientation, new Creating resource complementarity and resource diversity will have a positive impact on the final result. Resource complementarity can stimulate the business potential of potential enterprises, and resource diversity provides material support for the development of potential enterprises. Configuration 1c(ZYDYX*DTNL *ZYBP*CYDX) has the core conditions of entrepreneurial orientation, and has the marginal conditions of resource diversity, resource arrangement, and dynamic capabilities, indicating that when new entrepreneurial orientation is better, the impact of resource diversity, financial environment, and dynamic capabilities on the growth of new ventures Yes, but it is not decisive. In Configuration 2a (ZYDYX* DTNL* ZYBP* CYDX), resource complementarity and dynamic capabilities are the core conditions, and the existence of resource diversity and resource arrangement are marginal conditions, highlighting the importance of government support, The government plays an important role in the growth of new ventures, and government policy support is very important for the growth of regional enterprises. Configuration 2b (\sim ZYDYX*DTNL * \sim ZYBP *ZYHBX* \sim CYDX) has the same core conditions as configuration 2a. The marginal conditions are the lack of resource diversity, entrepreneurial orientation and resource arrangement, indicating that even without entrepreneurial orientation, new startups can rely on talents and government support to improve their own business growth. Configuration 3 (\sim ZYDYX* \sim DTNL *ZYBP*ZYBP* \sim CYDX) The core condition is the existence of resource arrangement and resource complementarity, and the lack of resource diversity, dynamic ability, and entrepreneurial orientation as marginal conditions, reflecting the joint effect of resource arrangement and resource complementarity, even if the new innovation does not have a good With the diversity of resources, dynamic capabilities, and entrepreneurial orientation, there is still a good growth of enterprises. The developed financial environment gives enterprises more funds and can seize more business opportunities.

4. Conclusion

Be fearless and strengthen resource orchestration capabilities. There are multiple paths to drive new ventures to produce high performance. Regardless of whether the external environment is highly dynamic, or whether the internal cultural environment of the organization has a high entrepreneurial orientation, if new companies can identify their own entrepreneurial opportunities, piece together and dynamically A perfect match of competencies can provide a reason with high explanatory power for its high entrepreneurial performance. Whether this is the most efficient path to high performance for new ventures, or the most efficient path to non-high performance, it has proven time and time again that the Timmons entrepreneurial process model is reasonably applicable to the Chinese research context.

Adapt to the environment and strengthen the relevant capabilities of the organization. For new start-ups that have not suffered from a dynamic environment and lack a highly entrepreneurial-oriented internal culture, enterprise managers should focus on cultivating the ability to assemble resources and identify opportunities. Because the common feature of enterprises in this state is that they have been established for a short time (less than one year), they can achieve short-term high performance as long as they solve the two core problems of resource acquisition and opportunity identification in entrepreneurship. It is necessary for new enterprises to strengthen their ability to cultivate their own entrepreneurial behavior and ability to identify entrepreneurial opportunities. For new ventures facing a high dynamic environment but with a high entrepreneurial orientation, business managers must strengthen the dynamic capabilities of the organization. For enterprises in this situation, the research results provide two reference paths for enterprise managers. One is to learn entrepreneurial knowledge under the strategic guidance of innovation, first move and risk-taking. Search and grasp all opportunities to improve performance; second, regardless of the level of entrepreneurial behavior, as long as you identify good entrepreneurial opportunities and have a capable learning team, you will definitely be able to attract the resources needed for entrepreneurship. But no matter which path managers choose, to achieve high entrepreneurial performance, the development of dynamic capabilities is necessary.

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