

EMPIRICAL REVIEW OF DYNAMIC CAPABILITIES AND OPEN INNOVATION: A THEORETICAL APPROACH

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Abstract

Identifying the elements that will guarantee a company's success or longevity is one of the most persistent questions in strategic management literature. The literature on strategic management has evolved throughout time, as evidenced by the organizational studies, based on differentiating essential abilities, and resource based viewpoints. Dynamic capability studies and open innovation are critical for scientific relevancy. Despite the fact that the significance of dynamic capability studies in management research has lately surfaced, certain research remains neglected in the most prestigious management publications. Furthermore, there is no comprehensive assessment of dynamic capability research and open innovation in the main management publications. This vacuum is filled by our analysis, which provides an overview of dynamic capability studies published in management journals, including their kind, conclusions, and real effect. According to our research, only a few studies on dynamic capabilities have been published in major tire journals. This pattern indicates a dearth of published studies in management research based on dynamic capabilities and open innovation. This study delves into what this entails for researchers who publish and evaluate management journals, as well as the editors who oversee such publications.

Keywords: Dynamic Capability, Strategic Management, RBV, Open Innovation

1. INTRODUCTION

The literature on strategic management has evolved, from strategies based on organizational studies (Porter, 1985) to those based on distinguishing and essential skills (Prahalad & Hamel, 1990; Hrebiniak & Snow, 1982) and resource-based viewpoints, among others. However, since the emergence of the dynamic capabilities' idea by (Teece et al, 2007) and neo-Schumpeterian perspectives on economic change, Innovation and the role have received considerable attention. It is significant because maintaining a competitive edge in rapidly changing environments requires not only the possession of specific hard assets (such as operational tools and facilities), but also a firm's adaptive capability to constantly transform its organizational and technological boundaries and acquire new market opportunities (Teece et al, 2007). The authors define the company's skills as knowledge, experience, and abilities, as well as the dynamic capabilities to incorporate, construct, and rearrange internal and external assets and competencies to identify and structure changing business contexts.

Even when the examined phenomena become more complex, methodology for research must become more attentive. The research subject should guide the methodology selection, which is crucial for the study's integrity (Edmondson & McManus, 2007). Other factors, like as accessibility and "journal" bias, may also have an impact. The increasing difficulty can be seen, for example, in the field of the company's RBV (resource-based view). Since Penrose's core notions in 1995, the subject has grown into new areas; "the DC method is only one example" (Barreto, 2010). The DC technique stems from the most recent research of (Teece et al, 2007), which was backed by a variety of different conceptual evaluations (Winter, 2003).

It is the ability to create unique assets and resource combinations (Barreto, 2010) or to revitalize organized management techniques, according to the DC literature. According to (Teece et al, 2007) description of DC, we redesigned the organization utilizing transformative processes that sought out and capitalized on new opportunities, as stated by Wang and Ahmed (2007). As a result, the DC model provides numerous functions. Changes in both resources and capacities are important components of DC. As a result, DC is a broad concept (Di Stefano et al, 2010), and expressing DC in experimental contexts necessitates the use of a multidimensional paradigm. Furthermore, because to the nature of the term, DC research must take the context into account, hence critical contextual information is essential (Ambrosini & Bowman, 2009). Dynamic capabilities have received a lot of attention in strategic management research. This is evident in the numerous literature reviews that reflect theoretical advances and empirical findings connected to dynamic capabilities (Pavlou & El Sawy, 2011; Teece et al., 2017; Vogel & Güttel, 2013). Such evaluations have highlighted theoretical difficulties for the field's growth, a few of which have been addressed in recent projects. In contrast, practical concerns have received much less attention.

For the growth of innovative activity, company officials have concentrated on techniques and closed processes (Zanjirchi et al, 2019). "Open innovation (OINN)" originated as a technique that combines with "open innovation" frameworks in response to the demands of hyper-competitive marketplaces. In the framework of Mexican SMEs, "open innovation" is a revolutionary approach that allows managers to utilize external business skills to enhance their technologies (Baa & Chattoraj, 2022). "New open innovation-based business models enable the merging of technology and organizational innovation management. This approach eliminates internal constraints and the involvement of all corporate stakeholders (managers, employees, clients, suppliers, and society), which leads to the formation of innovative behavior and motivation toward a cultural shift based on creativity and Innovation. Technological capability (TC) has been a key part of making businesses more innovative. It is seen as one of the most important dynamic capabilities for long-term profitability (Gërguri-Rashit et al., 2017).

Businesses are implementing "innovative business models" centered on adaptations that permit them to contend in environmental and sustainable target marketplaces (Veronica et al, 2019) in response to the appearance of innovative manufacturing practices or the rise in the figure of clients with socially responsible purchase behavior. Since many

companies are concentrating on developing green business products and reducing their negative impacts on the environment and the economy, eco-innovation (EINN) is becoming increasingly important. A growing number of businesses are considering implementing eco-innovation to increase profits while lowering their negative influence on the surrounding. To encounter eco-innovation problems," this method employs interconnected networks of partners and external stakeholders who engage together via open innovation platforms that incorporate both inbound and outbound activities" (Leitão et al, 2019).

According to dynamic capabilities theory (DCT), TC has a strong effect or substantial effect on "open innovation activities and eco-innovation," which combined promote improved market efficiency and aid in raising "corporate performance" (CPERF) (Teece et al, 2007). Also, SMEs in developing countries face both internal and external barriers. Internal barriers include not having a long-term plan and not having skilled workers. External borders include tough competition, the globalization of multinational corporations, and changes in the economy.

However, the present situation of dynamic capability research is uncertain because there is a lack of information on the number of works published in the most prominent MGT journals. Overall, research on these dynamic capabilities lacks specificity. This includes what kinds of dynamic capabilities studies have been conducted, what percentage of the time the results of DC research are validated (even partially), and what kind of influence this research has had on the research world. The argument about the significance and usefulness of DC research and the likelihood of a dynamic capability problem in management research becomes trivial and empirical without this type of analysis. In management research, there is a debate between those who think dynamic capabilities studies are important and those who don't. In our study, we fill that need. To ensure that all areas of management research are covered, we performed a comprehensive and rigorous evaluation of five of the most renowned management journals. Therefore, we concentrate on research into dynamic capabilities that draw on existing academic literature.

The following three questions will be the basis for our analysis: (1) "How dominant are DC and open innovation researches in main MGT journals overall and sub-domains"? (2) What kinds of DC and OI research are published in these journals? (3) What effect do they have on the scientific community as measured by citations?

2. LITERATURE REVIEW

2.1 Dynamic capabilities

Based on RBV, dynamic capabilities are a company's ability to obtain, develop, and reorganize the internal and external expertise it needs to adapt to an unforeseen situation (Teece et al, 2007). The RBV literature provided this conceptual framework to describe how a company's capabilities might give it an advantage in a competitive industry (Bessant et al, 2011). Studies of dynamic capability have been increasingly investigated

over the last decade for two main reasons. First, there is a limited empirical and quantitative study of dynamic capability, and the research that has been conducted on the topic has been performed on a "gradual basis," leading to conflicting and irrelevant findings. Second, and possibly, more importantly, the development and operationalization of dynamic capability remain unclear (Wang & Ahmed, 2007).

In light of these constraints, researchers view dynamic capabilities as a higher-order capability comprising several more basic capabilities. Wang and Ahmed (2007) follow a similar perspective, dividing capabilities into four different categories that are interconnected but still unique: adsorption, adaptation, Innovation, and network. With an absorptive capability, a company may recognize and apply relevant acquired knowledge from sources outside of the company. Another definition of a company's adaptive capabilities is its propensity to recognize and seize new opportunities as they emerge in the market (Oktemgil & Greenley, 1997). Companies with the ability to innovate develop innovative products and services. Lastly, "network capability" refers to "firms' capability to establish and leverage collaborative connections to gain accessibility to varied resources owned by other entities" (Walter et al, 2006). Because of this, businesses with the sub-capabilities required to confront the challenges brought on by an ever-changing environment successfully will be in a better position to succeed. An additional study of their evolution is needed to comprehend the mechanisms of dynamic capabilities better.

Researchers propose that TCs, often overlooked, play a critical part in a company's capability to grow or adapt. Previous research from the IS literature has tried to demonstrate how TCs could provide businesses with a strategic edge (Stoel & Muhanna, 2009). While TC has been established to affect the strategic advantage and firm performance, "the underlying processes" through which this occurs remain uncertain. The increasing perspective in the ground of research is that TCs "allow high-order capabilities" instead of communicating right to the effectiveness of the company (Mithas et al, 2011). Our study goes beyond this approach by examining how TC capabilities affect high-order dynamic capabilities.

Many different models of technological capability have been proposed in IS research, yet only a few available studies have tried to evaluate these characteristics (Mithas et al, 2011). Moreover, small businesses' IS departments, resources, and routines are typically less structured than those of larger corporations (Kannabiran & Dharmalingam, 2012), necessitating modifications to a number of the recommended constructs of TC. Accordingly, researchers opted to ignore TC infrastructure rather than concentrate on TC usage as the foundation for TC constructed on an LR and empirical perceptions. The researcher has also said that TC is an organization's skill at strategically using technologies that range from simple to very complicated, all for the organization's benefit.

2.2 Open Innovation

Over the last decade, "researchers have investigated company openness from a wide range of perspectives. Numerous studies claim that the growing popularity of OI (open innovation) is due to gradual shifts in the social, economic, and technological

characteristics of organizations and the marketplace; globalization and the emergence of innovations have engendered partnerships not only across geographical distances but also among businesses within territories (Dahlander & Gann, 2010). Multiple studies have demonstrated the complex character of openness. Multiple studies have examined the advanced functionality of OI (Huizingh, 2011), concentrating on its different aspects like modulation of openness level, inbound/outbound, and financial versus non-pecuniary OI measurements (Dahlander, & Gann, 2010); OI practices characterized into procedures and outcomes; Additional studies have examined the framework of OI by examining internal and external contextual elements (Huizingh, 2011)."

"Small and medium-sized businesses" are a valuable source of "innovation" in a competitive marketplace because they are typically more targeted than huge corporations and can work as integrated systems. SMEs serve a greater portion of the OI operations in the "Americas and Europe" (Lichtenthaler, 2008). "Small and medium-sized businesses" differ from large corporations in structure and strategic behavior. Furthermore, it could be noticed that several additional circumstances and the strategic decisions made by owners or managers have a significant effect on the success of SMEs. Historically, "small and medium-sized enterprises (SMEs)" were firmly grounded in certain areas of the economy and specialized activity areas. Nevertheless, in the current market environment, it is uncertain if many SMEs' specialized and localized strategies can be continued while retaining their effectiveness. OI may be one way for SMEs to evolve and thrive in situations that are becoming increasingly unstable and unpredictable.

Recent studies have shown that OI techniques are not just being implemented by large corporations but also by SMEs, with medium-sized businesses adapting to exploration activities at a faster rate than smaller companies. Current studies on OI activities in SMEs show that their size makes it hard to create practical methods for implementing an effective OI strategy (Gassmann, 2006). Yet again, this information will help illuminate the divergence in the OI trends of large and "medium-sized businesses. For example, while they have increased efficiency, many SMEs lack the personnel, facilities, and knowledge to cultivate a philosophy of "continuous innovation and OI." The likelihood that a small business will possess such assets and skills decreases as the size of the business decreases. Therefore, to succeed in today's challenging, energetic, and demanding business situation, SMEs must enhance their capabilities to reconfigure all or at least a portion of their managerial abilities and acquire considerably new capabilities (Teece et al, 2007).

SMEs must employ DCs to enable strategic organizational procedures to operate efficiently in volatile and fast-changing contexts. The growth of these capabilities is a reliable measure of a company's ability to generate innovative and creative strategies for achieving competitive advantage through specific organizational procedures (Grimaldi & Rippa, 2011). SMEs should adapt and reconfigure inside administrative processes in an open mode to support the "firm's exploratory and exploitative abilities (inbound and outbound activities)" besides integrating outdoor aids for the effective available implementation of new technologies (Spithoven et al, 2011) Caetano & Amaral, 2011).

Existing organizational capabilities, "including the use of economic, financial, and cognitive resources; managerial skills and strategic management; R&D activities; and external relationships and network capacity," must be updated or modified to fit the new requirements.

3. RESEARCH METHODOLOGY

3.1 Selection of Journals

The "ABS (Association of Business Schools) list (ABS, 2021)" of "top-level management journals" supports our selection of articles for study. The journals on the ABS list range in quality from 1 (the lowest grade) to 4* (the highest grade), and the list as a whole includes 2680 publications across 16 categories (ABS, 2021). This is the best possible result. We tried to search "(1) the Academy of Journal Management, (2) the Academy of Management Review, (3) the Administrative Science Quarterly, (4) the Journal of Management, or (5) the Business Ethics Quarterly from 2007 to 2022" for publications with a quality rating of 3, 4, or 4* in order to find studies on dynamic capabilities and open innovation that were quantitative. The purpose of this study was not to determine a comprehensive ranking of the "journals," but instead to learn "how the term "dynamic capabilities" as well as its components are now being employed and how prevalent different kinds of capabilities are" (e.g., African Affairs). We agreed on a selection of five journals for this "list."

3.2 Identification of Dynamic Capabilities Studies

In order to differentiate among the numerous studies of dynamical capabilities in these areas, we put together a list of targeted keywords (or word stems) "journals." We used the relevant keywords "according to previous studies (Köhler & Cortina, 2021)" "dynamic," "capabilities," "dynamic capabilities," "open innovation," "innovation," and "innovate." Researchers used these words in the search results of the relevant journals, enabling us to research the entire articles of all papers published up until the last volume in 2022.

Table 1 is our richest random sample from DC and OI studies. We checked Google Scholar for published studies in these journals since we were not able to download all volumes via the journal websites (advanced search function). Keyword searches were performed not only within the abstract and title but also throughout the text of the article. Each of the five journals reviewed included at least one article that satisfied the requirements. All five journals have come together to produce 1703 articles. After doing a keyword search, researchers chose 203 relevant papers from 1703. Then, we manually reviewed all 203 manuscripts to identify the empirical investigation. Various steps have been taken with this purpose in mind. To begin with, the study's authors eliminated any editorials, evaluations, or recommendations for the publishers. However, there are study notes and annotations added. Secondly, we did not take into account qualitative empirical research or incorporate any conceptual or theoretical research. Thirdly, we left out papers that were not assessed despite having one of the search terms (such as "innovate") in the title, abstract, or body of the study. Finally, we focused on studies that used a multi-

study approach without examining the available literature. Our study concentrates on attempting to examine previously published studies, although multi-study methodologies are preferable. We have not looked at monographs, dissertations, conference papers, or working papers because we have only looked at articles in academic papers. By means of the assessment standards, we selected 66 papers from 5 journals for our sample. Sample 1 (RS 1) in. The number of journals evaluated, the total number of articles retrieved, the extent to which a given keyword appears in the articles, and the total number of observations are all summarized in table 1.

Table 1: Number of Articles after Elimination Stages

Filter	Description	Article count after filter	Percentages
1	Search ABS journals, 2007 - 2022, for papers containing 'dynamic, 'capability, or at least one of 11 keywords suggesting empirical content.	101	18%
2	Review the abstracts and remove ones that do not exhibit quantitative empirical research on dynamic capacities.	93	46%
3	Download article full-text copies.	77	38%
4	Examine the publications and exclude those that do not quantitatively investigate variables specifically	66	32%
	Total number of studies collected identified DC and OI.	203	

Note: N=203

4. DESCRIPTIVE RESULTS

4.1 Frequency of DC Studies

Table 2 illustrates a chronological comparison of DC research frequencies between different phases of time. The overall number of DC studies has risen steadily between 2007 and 2015, with an anticipated peak between 2016 and 2022. The analysis also sheds insights on the deviations that exist among the various management research disciplines. Whereas we found 06 dynamic capability studies and open innovation in Academy of journal management, 10 in Academy of Management Review, 03 in Administrative Science Quarterly, 04 in Journal of Management and 03 Business Ethics Quarterly between year 2007 and 2015. On the other hand, we found 09 dynamic capability studies and open innovation in Academy of journal management, 15 in Academy of Management Review, 07 in Administrative Science Quarterly, 06 in Journal of Management and 03 Business Ethics Quarterly between year 2016 and 2022. These statistics indicated that number of DC and OI studies increased in numbers with slow pace in publication. Researchers evaluate a diverse variety of other scholarly parameters in our regression model, which may contribute to the reviewing research's effect. This

research distinguishes the characteristics of dynamic capabilities studies published in top-tier management journals. When thinking about its parameters, researchers examined the technological, digital, Innovation, and absorptive capability types of dynamic capabilities. A latent parameter was constructed to symbolize each potential description. Specialists were also considered if the study confirmed the initial study results. Similarly, we constructed latent variables to cover every probable result. Furthermore, investigators created a list of "dummy factors" that characterized the "journal's list" based on the ABS score (i.e., "The Academy of Journal Management, The Academy of Management Review, The Administrative Science Quarterly, The Journal of Management, The Business Ethics Quarterly").

Table 2: Dynamic Capabilities Studies over Time 2007-2015 vs. 2016-2022

S. No	Journal Name	2007-2015		2016-2022	
		No. of studies	% Age	No. of studies	% Age
1	Academy of journal management	06	9%	09	13.63%
2	Academy of Management Review	10	15.15%	15	23%
3	Administrative Science Quarterly	03	4.5%	07	10.6%
4	Journal of Management	04	6.6%	06	9%
5	Business Ethics Quarterly	03	4.5%	03	4.02%
	Total number of studies	26		40	

Note: N=26; N=40

Table 4 demonstrates the correlation between variables. We categorized the collection of DC and OI studies in technological, digital, Innovation, and absorptive capability types of dynamic capabilities and OI. Our analysis of correlation indicates that the categories of DC and OI specifically digital, Innovation, and absorptive capability have low and insignificant relationship with the citation of the study. This indicate that no matter what type of capabilities are evaluated in the study the citation criteria might depend or highly correlate with the other factors related to the study. It might be related to the topic, title and author prestige of the study. But innovative capabilities have high and significant relationship with absorptive capabilities. This indicates that only two capabilities correlate with each other, all other capabilities do not have significant relationship with each other. Furthermore, types of journals itself has been collected as dummy variable in the current analysis, academy of management journal indicates high and significant correlation with innovative capabilities. Also, academy of management review also has significant and high correlation with innovative capabilities. However, the significant relationship between journals itself is not very promising. Only few journals correlate with each other. Academy of management journal indicates high and significant relationship with Academy of management review. Whereas, Academy of management journal indicate slightly low but signification relationship with Business ethics quarterly. All other journals have insignificant relationship with each other. The correlation analysis evaluates that most of the collected variables has independent status and do not have correlation effect between each other. Furthermore, current research work conducts the regression analysis to

evaluate the main effect of the variables. This study has conducted the binominal regression and results and further explained.

Table 3: Correlations

	1	2	3	4	5	6	7	8	9
1	1								
2	.085	1							
3	.097	.159	1						
4	.022	.177	.860**	1					
5	.063	.157	.344**	.492**	1				
6	.262**	.015	.259**	.281**	.335**	1			
7	.145	.099	.045	.014	.142	.091	1		
8	.093	.108	.020	.023	.135	.179	.072	1	
9	.184	.294	.099	.183	.221*	.095	.144	.137	1

Note: **Correlation is significant at the 0.01 level (2-tailed).
 * Correlation is significant at the 0.05 level (2-tailed).

5. MULTIVARIATE ANALYSIS

5.1 Summary of Main Results

Our results are summarized in Table 4. We employed a multivariate regression model to carefully examine the factors of the DC and OI study results so as to get a full comprehension of the influence of these studies. DC research citation numbers were the "dependent variable" from August 2022 ahead. "Binomial regression was the primary predictor employed because this is a count variable consisting entirely of positive numbers. Explanatory factors were selected based on a variety of aspects of the DC and OI studies. Model 1 incorporates findings from the DC and OI study. Our regression model shows that research focusing on technological capability receives many more citations in DC and OI research areas. Research into absorption capabilities reveals a comparable but lesser impact. It will have a significant impact. According to the data, DC and OI studies perform well in the strategy research and innovation sub-domains in terms of the number of citations they obtain. First, our findings show that leading management journals often publish articles on dynamic capabilities. A comprehensive investigation of five management journals revealed just 66 dynamic capability studies. We found that 73% of the literature on dynamic capabilities is directly applicable to technical capabilities. About half of our total selection was determined by the fact that they had the ability to think creatively and independently. Following digital capability, we found absorptive capability, which consists of just 12 research samples sampled by ABS. One possible explanation is that leading "journals" in MGT are selective towards publishing DC and OI studies that challenge their findings. According to a regression study, when there is a lot of time between two DC AND OI studies, there is a lot of bias against research. These findings contribute to the ongoing discussion on the significance of dynamic capability in management research (see, for example, (Bergh et al, 2017) Köhler & Cortina, 2021; Maula & Stam, 2020). Our results show that the current condition of research into DC

MGT is unsatisfactory or must be addressed immediately. Most notably, the best journals in the domain. We can see the relationships between our "regression analysis" variables displayed in Table 4.

Table 4: Binomial Regression Results

Model	(1)	
Variables	Coeff.	(SE)
Characteristics of Dynamic capability		
Type: technological	0.738	(0.491) *
Type: digital	0.399	(0.289)
Type: absorptive	0.259	(0.184) **
Type: innovation capability	0.532	(0.301)
Journal List		
Academy of journal management	0.351	(0.449)
Academy of Management Review	0.661	(0.487) *
Administrative Science Quarterly	0.091	(0.381)
Journal of Management	0.289	(0.296) ***
Business Ethics Quarterly	0.183	(0.375)
Log-Likelihood	305.829	
Observations	66	
Notes: Dependent variable: citations of the study, Standard errors clustered at the journal level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$		

6.2 Discussions and Managerial Implications of the Study

This research provides several managerial and practical contributions to management research and practice, which are discussed below:

First, there is a lack of consensus in the discipline; it is unclear what good DC research comprises or what influence it must make to be "published in the top management journals." We discovered a wide range of DC research after analyzing the 66 DC studies included in our sample of DC studies. Though Köhler and Cortina (2021) offer considerable evidence of effective DC besides templates, we have yet to obtain editorial assistance from the top journals. The following concerns must be addressed: In the case of a DC study, what makes a sound conceptual or empirical commitment? Is it required to expand the research to achieve an adequate level of conceptual innovation? What is the appropriate application structure for dynamic capability research? Could they be presented as research reports? To what degree is a segment based on one's own hypothesis or theory needed?

Additionally, the next significant problem is the accessibility of information from published studies. It is sometimes impractical for writers of studies to undertake particular types of DC if they employ archive information from public data or widely available sources (e.g., absorptive capability). This information scarcity could explain why ACs are so infrequent in our sample and why most DC seem to be either TC or IC. Top "journals" in relevant domains, like FIN (e.g., Journal of Finance) or ECO (e.g., American Economic Review, Quarterly Journal of Economics)", have taken a stage further beyond MGT and made it a

prerequisite for researchers of approved articles to submit their datasets. This enables other researchers to undertake more concentrated DC studies for a argument of code and information-sharing strategies in FIN and ECO). The same free access rules have produced significant research that found discrepancies in earlier studies, resulting in rejection. Such denials are even prevalent in the “natural sciences” as Disclaimer Watch’s LST of the best maximum quoted articles rejected manuscripts demonstrate. We didn't find a great example when we looked for DC research in MGT, which backs up our idea that "management research" might be lacking in this area.

We'd additionally like to point out that several management publications already have established policies. Management Science, for example, has asked writers of approved articles to make their information and coding accessible for generalization since 2019. Other journals, in our opinion, must adopt these practices because they have substantial research significance: Future survey-based or empirical studies may look at the variables or obstacles that encourage researchers to participate in DC studies, in addition to the reasons they chose specific research. Factors involved or constraints are, for example, data access, the effect of the original research, the credibility of the "journal," or even the main study's writers, and term considerations. From the journals' viewpoint, a detailed understanding of these variables could be a necessary precondition for understanding how to encourage DC research. These results could also be consistent with the early studies performed by (Mueller et al, 2019), who examined bibliographical information to figure out which papers were selected for review studies.

7. CONCLUSIONS

Findings of our study have significance for the (would-be) writers, reviewers, and editors of management research. According to the reviewed studies, one of the significant obstacles to doing a DC study is the strict requirements set by the top journals for submitting articles (e.g., Corley & Gioia, 2011). Therefore, DC research may not be alluring due to criticisms of insufficient theoretical contribution or absence of Innovation (Köhler & Cortina, 2021). Management research confronts a major problem in removing the emphasis on academic assistance. Additional findings from our study have been given limited attention until now and are presented and discussed.

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