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Supply chain management, organizational innovation and corporate culture: The impact of relatedness

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The growth and survival of organizations in a competitive global economy necessitates reaching markets through various competitive mechanisms. The integration of supply chain management and organizational innovation has been identified as providing such competitiveness. This paper introduces corporate culture and identifies unique relationships between these variables. Furthermore, constructs are introduced to empirically examine the relatedness between the variables. Using the data collected from 379 Kun-Shan City service industries in Taiwan, the study employs multiple regression analysis to examine the effects of relatedness between the identified variables and constructs. Recommendations of relatedness are provided, adding to the body of knowledge and practical application to industry. This is the first empirical study to investigate such relatedness in a service industry setting in Taiwan, and recommendations for further research are provided.

Key words: Supply chain, innovation, corporate culture, management, organization.

INTRODUCTION

Global entrepreneurship, innovation and competitive mechanisms have lowered barriers for corporate venturing, and organizations have to allocate resources appropriately to maintain competitive (Maritz and Salaran, 2010). Curtis and Corsi (2003) stated that prominent competition among businesses is among supply chains, and organizational innovation is one of the keys for bringing the whole superiority of the supply chain into full play. When practicing supply chain management, corporations are supposed to transform the traditional organizational structure to the one with market orientation. Organizational innovation is a learning process which causes changes to the organizational structure and functions to face the constant changes of the market.

An organization is the assembly of a certain number of the mission systems such as the marketing system, the production system, and the logistic system. The function of each system is part of achieving market value, and can adapt to the profound changes of the external market. Mc'Adam and Mc'Cormack (2001) thought organizational innovation under the environment of supply chains is to comprehensively and systematically resolve not only the problems of the organizational structure and operation of a corporate, but also those of the connection among corporations in order to adapt the corporations to the

needs of supply chain development. Corporate culture explains the beliefs, values, attitudes and experiences of a corporate. It displays the specific collection of values and norms in a corporate, and the way that its members interact with each other and with stakeholders outside the corporate. In other words, the culture also shows its impact on how a corporate interacts with its distributors and suppliers, and on the way the corporate learns to survive. Cummings and Worley (2005) proposed six guidelines for cultural change: to formulate a clear strategic vision, to display top-management commitment, to model culture change at the highest level, to modify the organization to support organizational change, to select and socialize newcomers and terminate deviants, and to develop ethical and legal sensitivity. Therefore, it is interesting for us to further investigate the role of the corporate culture on the relations between supply chain management and the organizational innovation.

LITERATURE REVIEW

Supply chain management

Supply chain management links suppliers, production

facilities, distribution and delivery services and customers together through the transmission of information flow and the feed-back of material and supplies (Migiro and Ambe, 2008). Supply chain management is to offer the administration of the channels from material to product distribution, break through the limits of a single corporate, and provide and share the indispensable information among corporations (Johnson and Wood, 1993). The supply chain management during the actual operation covers not only the internal inspiration and improvement, but the process connection among external suppliers and customers. Kalakota and Whinston (1996) said supply chain management features with the four dimensions; distribution and selling channel, the inventory control, the partner relationship and the information technology.

Distribution and selling channel

As located in the environment of shorter and shorter product life cycles, and facing more and more demands required by customers and distributors for prompt delivery, corporations have to use supply chain management to compress business operational time. Through sharing information, corporations can understand in time the demands and stock of all distributors of the channel (Overby and Min, 2001). If corporations operate in coordination with the optimal distribution process, they can not only reduce the artificial connection of high cost, but curtail imperceptibly the delivery time of the technical information, the product information and the price information and so on.

Inventory control

Supply chain management should be able to manage goods in stock, and shorten the process through the order, production, delivery and collections. Through network and telecommunication, the inventory control can operate in coordination with the demands, and then increase the turnover rate of goods in stock, and eliminate the cost waste derived from the excessive stocks or the short supply (Grozniak and Maslaric, 2010). Supply chain management should have flexible control and feed-back mechanism, with which to coordinate the supply-demand relationship and regulate production (Thomas and Griffin, 1996). This mechanism is a critical factor for the inventory control of supply chain management.

Partner relationship

The purpose to form alliances is that corporations hope to raise their control over both the supply channel and the distribution and selling channel, reduce the uncertainty of both channels, and further improve the financial and

operational performance of each member (Maloni and Benton, 1997). Corporations are supposed to bridle the number of suppliers, and carefully choose the partners with the common threads for creating the win-win relationship together. For example, appropriate suppliers can bring corporations the beneficial results such as the decrease in the cost of processing the orders, the accuracy promotion of delivery time and destination, and also the shortening of the pretreatment time of the orders.

Information technology

The system of supply chain management refers to the whole network structure of the supply chain, and the key commercial processes of the information flow and the product flow (Lambert and Cooper, 2000). Namely, this system provides the necessary information flow through the Internet to make the integration of the activities of the coordinated business activities become easy. This system also means the whole network structure of the supply chain from raw material suppliers to end users, and covers the activities of the information flow, the product flow, the cash flow and the coordination flow and so on. On the other hand, it is the key commercial processes which make the activities of the coordinated business integrated easily through the use of the information technology.

Organizational innovation

Breaking through the current practices and improving the current efficiency are the way for a corporate to face more challenges and adapt to more changes. An innovative organization attaches importance to creativeness (originality) and innovation changes, and supports its members to pursue new concepts independently (Gazi et al., 2010). Innovation is a tool of entrepreneurship, and corporate venturing is a pre-requisite for rapid development of organizations in a global economy (Maritz and Lobo, 2009). Scott and Bruce (1994) said that when the members of an organization are conscious of the organizational climate of innovation, they perceive the organizational support for innovation. Such consciousness influences the occurrence of innovation behavior. On the other hand, the expectation of the management level on the innovation of the subordinates also impacts their innovation behavior. Tomala and Senechal (2004) organizational innovation covers four major topics such as process innovation, function innovation, operation mechanism innovation and transverse coordination innovation.

Process innovation

The process problem is how to manage ideas into good currency, and after the conversion, an innovative idea just

can be accomplished and systemized (Kim, 2000). According to the thread of business reengineering, corporations should start with the optimal systematic thought of the whole process, face with customers and suppliers, and optimize their business processes. Then, they can achieve the maximum appreciation of the activities of each link, and reduce the ineffective or non-appreciation activities as much as possible. At the same time, the selfish departmentalism and the interest dispersion approach can be eliminated.

Function innovation

People and organizations in general used to focus most on both profitability and the protection of the existing habit, and not to focus on developing new ideas. Therefore, it is harder for a more successful organization to stimulate its members to pay heed to new ideas, demands and opportunities. The flat structure of an organization can make the installation of organizational function more active and expedite the speed of strategy-making (Kleijnen and Smits, 2003) . With a flat organization, corporations can transfer its power to the lower levels, become nimble in information, digitalize the operational performance, and curtail the time for reflecting and resolving problems.

Operation mechanism innovation

In the changes from functional management to business process management, corporations should stress how to manage the business process for the part-whole relationship, and how to orientate both the business examination and the key point for decision-making. In such a situation, corporations are able to make the channel of the information communication flow freely, and shorten the time of communication. Then they can raise both internal and external customer satisfaction. Also, because most of the innovation processes focus on multi-functional ones, corporations must take care of the resource allocation and use, and offer training programs to convert the innovative ideas into reality.

Transverse coordination innovation

Transverse coordination innovation is to stress coordination and connection, promote both feeling and partnership among fellow workers, and reduce and eliminate the communication barriers among departments (Tomala and Senechal, 2004). Influenced by the instability of the market, corporations need frequently each department and post to negotiate responsibility, function, power and operational mode through the transverse coordination. Kleijnen and Smits (2003) also said

that the supply chain of corporations can link with the value chains of up-stream suppliers and down-stream buyers to form a valuable industrial supply chain, which fully and effectively links transverse coordination, and merges a sense for the reinforcement of the industrial competence.

Corporate culture

Corporate culture is ordinarily divided into three kinds; bureaucratic culture, supportive culture, and effective culture (Heye, 1992). Bureaucratic culture often appears in the rank-type organization, which comparatively concerns procedures for handling affairs. The rank-type organization of bureaucratic culture does not encourage innovation. Generally speaking, corporations with bureaucratic culture are comparatively stable, mature and cautious in handling affairs; for example, most of governmental organizations and large-scale corporations with long history show these features (Frohman, 1998).

With relatively open and free working environment, harmonious organizational climate, rapid circulation of message and good communication between ranks, the organizations with supportive culture can provide their staff with the opportunities of learning from one another and make them enjoy a warm family feeling. This kind of organization attaches importance to employee participation and team spirit and lays stress on the orientations of human relations (Brink, 1991; Goffee and Jones, 1998). The organizations with the effective culture attach importance to work achievements and efficiency, in which mutual competition exists between employees and between divisions. With high united spirit, low social contact, strong objectives and courage to overcome impulsion and accept reformation, these organizations attach importance to result instead of process (Brink, 1991; Goffee and Jones, 1998).

Organizational innovation, the supply chain management and the corporate culture

Williams et al. (2002) stated organizational innovation would drive the changes of the whole organizational framework and that of employees, which further affects the operation of the whole supply chain. The increasing requirements for the cooperation and the connection between buyers and suppliers would cause strong effects to the organizational innovation (Lee, 1995). Atuahene-Gime (1996 a/b) also stated that supply chain management mainly concentrates on the advantage and quality of the product innovation. As for service industry, the advantages of innovation in both service and quality are subject to a good supply chain management.

Athaide et al. (1996) said that in the proceeding of both product innovation and technique innovation, the supply

chain relations between buyers and suppliers determine whether the organizational innovation of high-tech industry brings success. On the other hand, Garcia-Dastugue and Lambert (2003) also said that the supply chain management and the organizational innovation can help an organization disperse risks and improve efficiency in business operation.

The biggest difficulty in supply chain management is how to eliminate the gulfs inside and outside corporations. The rapid environmental transition makes the capability of corporations more important to response the changes of environment and to eliminate the internal and external gulfs. Such capability is not only affected by the corporate culture, but also deeply influenced by the fact of whether the organization can make innovation or not. It can be seen that an obvious positive correlation exists between corporate culture and supply chain management (McAdam and McCormack, 2001). Cooper et al. (1998) stressed that each corporate's supply chain has its own corporate culture, while these individual corporate cultures are the important factor affecting the integration benefits of the whole supply chain.

The type of the corporate culture affects the possibility of the individual innovation and the organizational innovation. The bureaucratic culture restrains the individual innovation and the corporations' ability to make any transformation against competition. The supportive culture is easiest to encourage the individual innovation, and can also make corporations happy to change for improving their competences. The effective culture can encourage the individual innovation. However, its excessive emphasis on results will bring on the contrary conflicts among staff, and becomes a big obstruction for the organizational transformation. Hurley and Hut (1998) said that an organization would provide more resources to encourage more innovation and develop competences if its culture stresses innovation. Each corporate's supply chain has its own corporate culture, while these individual corporate cultures are the important factor affecting the integration benefits of the whole supply chain (Cooper et al., 1998).

Based on the dimensions mentioned above for the three variables, the study was to extend the understanding of the relatedness among the three variables. It is expected that the results of this study could be helpful to theoretical development, and industry application.

METHODS

Research framework and hypotheses

There were three variables (Supply Chain Management, Organizational Innovation, and Corporate Culture) in the study. They were assorted into their respective dimensions (Supply chain management: distribution and selling channel, inventory control, partner relationship, and information technology; organizational innovation: process innovation, function innovation, operation mechanism innovation, and transverse coordination innovation; corporate culture: bureaucratic culture, supportive culture and

effective culture). The correlation analysis among the three variables was carried out in the study.

The framework for the study was developed and shown in Figure 1. There were four hypotheses (H1 - H4) to be tested in the study, which assumed that Corporate Culture can enhance the positive correlation between the four dimensions (Distribution and selling channel, inventory control, partner relationship, and information technology in order) of supply chain management and organizational innovation.

Sample

Kun-Shan City is the place where Taiwan-invested service industries were located most in the Hua-Dong region of China. Wang (2001) addressed that classified by the regions where Taiwanese invest and based on the five criteria such as natural environment, infrastructure, public facilities, social environment and law-politics environment, Kun-Shan City is ranked class A. Additionally, the city is also ranked class A, if evaluated on social innovation, legal system innovation, business operation innovation, the level of expatriates, and service industries innovation. Therefore, the Taiwan-invested service industries in Kun-Shan City were chosen for sampling for the study.

In this research, samples were chosen by way of convenience for sampling. The directors and staff of 50 Taiwan-invested service industries in Kun-Shan City were taken as samples for answering questions about the supply chain management, the corporate culture and the organizational innovation. One thousand questionnaires were sent out, and 379 were resumed. After removing 8 invalid questionnaires, the rest 371 ones were used for further analysis through the factor analysis, the reliability analysis, the basic descriptive statistics analysis, and the Pearson's correlation analysis and the multiple regression analysis. Every answer in the questionnaires reclaimed could represent the valid sample for variables. Therefore, it conformed to the tenor of research for this study.

Research tool and scale

The scale used here was 6-point Likert scale. There were three Scales adopted in this study. The Scale for Supply Chain Management was constructed by following the questionnaire of Kalakota and Whinston (1996), and through the factor analysis the questions were assorted into the four dimensions. The Cronbach's

of separate dimensions were 0.81 (Distribution and Selling Channel), 0.83 (Inventory Control), 0.78 (Partner Relationship) and 0.85 (Information Technology), and the Cumulative Percent of Variance for this Scale was 74. The Scale for Corporate Culture was constructed with 5 questions derived from the relative questionnaires of Heye (1992). The Cumulative Percent of Variance and the Cronbach's for this Scale were 79 and 0.93, respectively. The Scale for Organizational Innovation was composed of the questions in the questionnaire of Tomala and Senechal (2004). The Cumulative Percent of Variance and the Cronbach's for this Scale were 60 and 0.94, respectively.

The respective average score in the 6-point Likert's scale for each question of the three Scales was higher than 3 points. Therefore, it can be seen that these questions in the questionnaire exist and happen in reality. On the other hand, it is obvious from the results of the factor analysis and the reliability test that the dimensions of each variable were worthy to further carry out the correlation analysis and the multi-regression analysis among the variables. The entire sample (N = 371) together with the three partial cases in this study was used for hypothesis test, which were identified by emphasis on Bureaucratic Culture (n = 93), on Supportive Culture (n = 160), and on Effective Culture (n = 118),

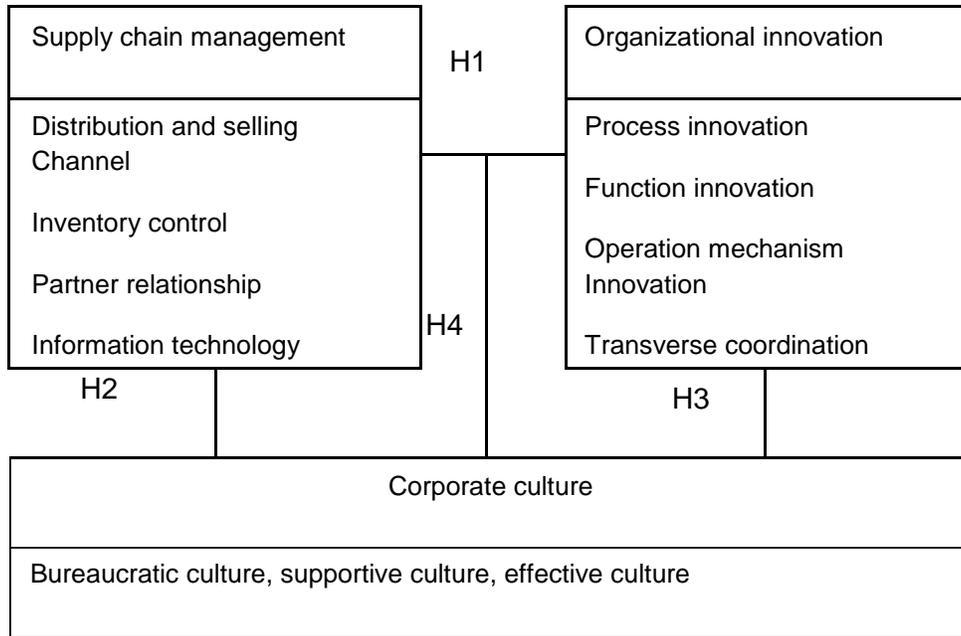


Figure 1. The research framework.

respectively.

RESULTS AND DISCUSSION

For the analysis on the correlation between supply chain management and organizational innovation, it was found that except for inventory control (correlation coefficient: -0.084, -0.070, -0.070 and -0.095), the other three dimensions of supply chain management had a significantly positive correlation with organizational innovation. For example, the correlation coefficient between distribution and selling channel and the four dimensions (process innovation, operation mechanism innovation, function innovation, and transverse coordination innovation) of organizational innovation were 0.149**, 0.181**, 0.160** and 0.178** in order. For the analysis on the correlation between the corporate culture and the supply chain management, it was found that corporate culture showed a significantly positive correlation with all dimensions of supply chain management but inventory control (correlation coefficient: 0.149**, 0.201**, 0.194**, -0.017 for distribution and selling channel, partner relationship, information technology, and inventory CONTROL in order). For the analysis on the correlation between the corporate culture and the organizational innovation, it was found that corporate culture showed a significantly positive correlation with the four dimensions of organizational innovation (correlation coefficient: 0.794**, 0.818**, 0.794** and 0.797** for process innovation, operation mechanism innovation, function innovation, and transverse coordination innovation in

order).

From t-values of distribution and selling channel (Table 1), t-values of the entire sample were higher correspondingly than those of the three partial cases. For example, the t-values of distribution and selling channel under the dimensions of process innovation, operation mechanism innovation, function innovation or transverse coordination innovation (Row: distribution and selling channel; column: process innovation, operation mechanism innovation, function innovation or transverse coordination innovation) for the entire sample were 3.119, 4.121, 3.496 and 3.906 in order and those for the partial case identified by emphasis on Bureaucratic Culture were 0.746, 2.454, 2.032 and 2.850 in order. Therefore, H1 was untenable. From t-values of inventory control under transverse coordination innovation (Row: Inventory control; column: transverse coordination innovation), that (-3.001) of the entire sample was higher than that (-3.070) of the partial case identified by emphasis on supportive culture. However, from t-values of inventory control under the dimensions of process innovation, function innovation or operation mechanism innovation, those (-2.698, -2.235, -2.267) of the entire sample were lower correspondingly than those (-2.120, -1.669, -1.871) of the partial case identified by emphasis on supportive culture.

From t-values of inventory control, t-values of the entire sample were lower correspondingly than those of the partial cases identified by emphasis on bureaucratic culture or effective culture. For example, the t value of inventory control under process innovation (Row: inventory control; column: process innovation) for the

entire sample was -2.698, and that for the partial case identified by emphasis on Bureaucratic Culture was -0.915. Therefore, H2 was partially tenable.

From t-values of Partner Relationship, t-values of the entire sample were higher correspondingly than those of the three partial cases. For example, the t-values of Partner Relationship under the dimensions of Process Innovation, Operation Mechanism Innovation, Function Innovation or Transverse Coordination Innovation for the entire sample were 5.966, 6.046, 5.906 and 6.223 in order and those for the partial case identified by emphasis on Bureaucratic Culture were 2.423, 2.446, 1.591 and 2.144 in order. Therefore, H3 was untenable.

From t-values of Information Technology, t-values of the three partial cases were lower correspondingly than those of the entire sample. For example, the t-values of Information Technology under the dimensions of Process Innovation, Operation Mechanism Innovation, Function Innovation or Transverse Coordination Innovation for the entire sample were 4.426, 4.871, 4.618 and 5.172 in order and those for the partial case identified by emphasis on Bureaucratic Culture were 1.514, 2.439, 2.142 and 3.017 in order. Therefore, H4 was untenable.

This study found that under Supportive Culture, the relationship between Inventory Control of Supply Chain Management and Transverse Coordination Innovation of Organizational Innovation could not be enhanced toward positive correlation (original t-value -3.001 but -3.070 under Supportive Culture); nevertheless, the relationship between Inventory Control of Supply Chain Management and the rest three dimensions (Process Innovation, Function Innovation and Operation Mechanism Innovation) of Organizational Innovation could be further enhanced toward positive correlation under Supportive Culture (Row: Inventory Control, Column: Process Innovation, original t-value -2.698 but -2.120 under Supportive Culture; Row: Inventory Control, Column: Function Innovation, original t-value -2.267 but -1.871 under Supportive Culture; Row: Inventory Control, Column: Operation Mechanism Innovation, original t-value -2.235 but -1.669 under Supportive Culture). Moreover, the relationship between Inventory Control of Supply Chain Management and the four dimensions of Organizational Innovation could be enhanced toward positive correlation under either Bureaucratic Culture or Effective Culture.

However, bureaucratic culture, supportive culture and effective culture all could not enhance the original positive correlation between the three other dimensions (distribution and selling channel, partner relationship, and information technology) of supply chain management and the four dimensions of organizational innovation. This may be because their original positive correlations were strong enough. Therefore, the three cultures could not show any further impact on their positive correlation.

As discussed above, the influence of the corporate culture on the relations between supply chain management

and the organizational innovation were summarized in Table 2. The information in Table 2 revealed that it is an interesting topic for future research on the relation between the inventory control and the organizational innovation by setting the inventory control as a major variable and disclosing its relevant dimensions.

Conclusions and Suggestions

Carrying out supply chain management and the organizational innovation is able to help maximize organizational value and competence in the market. The corporations practicing supply chain management must set up an organizational structure with innovation to face the internal and external challenges for advancing competence. Based on the results of the study, the following suggestions were proposed:

Dispersion of decision-making power

The acquirement of competence of an innovative organization relies largely on the development of creativeness of all staff. Therefore, such an organization should emphasize that each member or team must be able to set into action independently the operation strategies, take responsibility for management, and link together to form the intact value chain. All these require an organization to distribute the power of production and operation to the basic level for the fulfillment of the organizational targets.

Networking of information structure

Rapid changes of the environment under competition require a corporation to show its ability of quick response. How fast an enterprise can react to the changes of the environment becomes the decisive factor for its survival from competition. Therefore, it is essential for each member of the supply chain to rely on Internet to carry out all activities of information exchange.

Establishing the common vision and eliminating the innovation obstruction

An organizational system always reaches a relatively stable state after operation for a period of time. When an organization is located in a more steady state in either culture concept or value, resistances always occur during the development of organizational innovation. Therefore, a corporation that hopes to be benefited from the supply chain needs to offer relative training on the importance of reform and innovation to its staff. In such a way, it can be expected that the common vision and responsible sense

Table 2. The relations between the supply chain management and the organizational innovation under the influence of the corporate culture.

	Distribution and selling channel				Inventory control				Partner relationship				Information technology			
	OC	+S	+B	+E	OC	+S	+B	+E	OC	+S	+B	+E	OC	+S	+B	+E
PI	+	--	--	--	-				+	--	--	--	+	--	--	--
OMI	+	--	--	--	-				+	--	--	--	+	--	--	--
FI	+	--	--	--	-				+	--	--	--	+	--	--	--
TCI	+	--	--	--	-	--			+	--	--	--	+	--	--	--

Note: +: Significantly positive correlation; -: no significantly positive correlation; : to influence the relation toward positive correlation; --: no influence on the relation. PI: Process Innovation; OMI: Operation mechanism innovation; FI: Function innovation; TCI: Transverse coordination innovation; OC: Original correlation; + S: under supportive culture; + B: under bureaucratic culture; + E: under effective culture.

will be formed among the staff, and they will try to smooth away resistance together for setting into action the organizational innovation.

Earning partners' support and cooperation

The organizational innovation of the corporation which practices supply chain management is different from the internal process structuring of a single corporation. Except for the internal process structuring, the corporation must transform the joint business, such as business tie-up with suppliers and distributors. Thus, the organizational innovation of such a corporation is supposed to start with the whole system for better coordination, support and cooperation with partners. Otherwise, the whole coordination of the supply chain can not be guaranteed.

Briefly, to practice the new organizational and business mode can help the corporations of the supply chain management offer the accurate amount of qualified material, spare parts and products in right locations and at right time. The adoption of a new mode would also raise the level of the whole operational strategy of a corporation, and thereafter help the corporation survive from and succeed in the fierce competition.

By the way, the study did not focus on the corporate performance, but on the relations among the three variables. Their respective dimensions with detailed discussed in the literature review were certainly the main objectives of the study. Culture affects individual or organizational behavior and mindset which further impact whether individuals or the organization could practice well internal/external learning and innovation, and cooperation with stakeholders for survival. The dynamics of the relatedness of these variables and dimensions open a whole new area of study, particularly across other industries, regions and countries.

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