

From Green Building Material to Platform Economy: How MOSIA Upgrades Social Innovation and Leads Industrial Transformation

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Abstract: In the market of the healthy residence industry nowadays, the universal value of health has been increasingly emphasized and pursued. It caused the interior renovation process and quality to undergo increasingly strict inspections and requirements. To pursue sustainable development and solve the long-standing gap in the health field, Taiwan's first ecological green building material manufacturer, MOSIA invested in establishing a social enterprise, GDcometrue.com. It connected the capabilities and resources of industry partners, such as designers, workers, equipment vendors, and material vendors, to reshape the industry value chain, set industry standards, develop a comprehensive green renovation solution, and guide the construction of industry ecosystem and put industry's turnaround and innovation into practice. By transforming the industrial ecosystem, the company explores innovative business development and reconfigures and redeploys resources. GDcometrue.com shaped Asia's first green renovation service system, then that system became Asia's first and largest shared economy platform for "green design," and promoted a benchmark business model for cross-industry cooperation. The company used its unique platform business model to create market value and satisfy the dynamic needs of the market and customers. Ultimately, the company achieved organizational ambidexterity to cope with industry environment changes and provide a novel solution for the gap in the global green building industry and green building material industry.

Key words: Exploration and exploitation, green design, resource bricolage, social innovation and service.

1. Introduction

For consumers, interior design is the last step of establishing a home. Although international green building and green building material certification systems are in place, such as the Leadership in Energy and Environmental Design certification and the WELL certification from the International WELL Building Institute™, the Taiwan interior design industry focuses on environmental protection and energy conservation aspects and construction material quality control. Home interior repairs and renovations, which are relevant to citizens' quality of life, can easily cost up to several hundred, thousands or millions of NTD. Due to the lack of a comprehensive standard construction process and certification mechanisms, countless renovation disputes have emerged. According to Taiwan's Indoor Air Quality Management Act, the

formaldehyde concentration of Group 1 carcinogens in indoor air must not exceed 0.08 ppm. This value is also the current universal standard. However, these regulations cannot be implemented in conventional home spaces or subsequent inspection mechanisms. Despite the buildings appearing healthy after renovation, the building residents are unknowingly residing in sick homes. The renovation market now has three major problems in the current market: (1) an abundance of toxic building materials and occurrence of illnesses and cancers among residents after renovation; (2) nontransparent information disclosure which prevents customers from acquiring complete information on the used renovation materials and prices, thus subjecting customers to exorbitant prices and exploitation; and (3) the lack of a certification system, which results in no recognized standards for renovation quality.

MOSIA actively produces and sells green building materials and also encourages industry peers to manufacture and produce green building materials. However, the promotion of green building materials was insufficient to solve customer problems and industry gaps. In response to these cornerstones of modern life, sustainable development and health, and consumers' increasingly strict views and demands for renovation processes and quality, MOSIA, which has 17 years of experience in the building material market, established GDcometrue.com (hereinafter referred to as "GD"). To reshape the industry chain, MOSIA employed its exceptional foundation of resources and capabilities and cooperated with industries, the government, universities, and institutes to construct a "Three-Period, Four-Stage, Five-Review" set of green design-certified process services and certification standards. The standards encompasses the three periods before, during, and after renovation; the four major stages of planning and design, building materials application and management, renovation environment management, and completion and acceptance; and the five participants of the renovation process, namely reviewers, designers, material suppliers, equipment suppliers, workers, and consumers.. On-site air quality assessment is provided upon completion and the assessment process is recorded. A comprehensive green manual of building material records is issued with transparent prices and compositions, thereby truly achieving health popularization and price transparency.

In this study, resources orchestration, boundary-spanning capability, and organizational ambidexterity in leadership theory were employed to investigate the three development stages of the GD enterprise. By analyzing the enterprises' development from MOSIA's professional manufacturing of ecological green building materials to GD's shaping of a green renovation service system and shared economy platform, the researchers examined how small and medium-sized enterprises or new ventures employ cross-industry and cross-border cooperation to expand internal resources outward in the current global business environment, which is characterized by fierce competition and change. During expansion, enterprises seek collaborative opportunities and resources from external partners such as customers, competitors, suppliers, or even members of other industrial ecosystems. In the industrial ecosystem, enterprises use advantages in preexisting internal resource capabilities and adopt a broader macro resource-based view and strategic vision to strengthen development of advantages in preexisting products and explore the development of innovative businesses. The enterprise then rearranges, distributes, and combines its resource advantages to develop organizational ambidexterity. Subsequently, the enterprise creates market value by using its unique platform business model to satisfy the dynamic needs of the market and customers, thereby achieving sustainable development.

2. Literature Review

Discussions on the competitive advantages of enterprises have primarily adopted industry structure and resource-based views to expound on and reinforce one other. The cores of these perspectives emphasize that enterprises employ resource allocation and deployment to develop unique resource positioning better than that of competitors. Michael Porter, who has represented the industry structure school since the 1980s,

argued that competitive advantages derive from “the value that enterprises can create for customers.” To maximize value creation, Porter proposed a value chain concept for the internal management activity of enterprises. In brief, enterprises should strive to attain the capacity to provide the same benefits as competitors at a lower price or to provide unique benefits to increase prices [1].

Compared to the industry structure school’s view of achieving competitive advantages through external sources, Birger Wernerfelt proposed a resource-based view advocating that competitive advantages derive from enterprises’ internal resources and emphasized that the conventional product view of enterprises should be replaced by the resource-based view as the corporate strategy planning direction. Enterprises create products by inputting resources and providing service applications. The generated product competitiveness from this process can serve as a resource for the enterprise. Therefore, enterprises should emphasize the concept of resources more than that of products [2]. In addition, Robert Grant proposed the resource-based theory to strengthen the discourse. He believed that past strategies emphasized the relationship between organizations and external environments but neglected the connection between strategies and internal resources. Enterprises should be concerned about identifying, clarifying, cultivating, developing, and protecting “core resources” or “distinctive competency” to create competitive advantages. Enterprises that focus on its internal resources and distinctive competencies can formulate strategies and competitive advantages [3]. Charles Hill and Gareth R. Jones proposed that the distinctive competency of enterprises derives from two complementary sources, namely the organizations’ resources and its capabilities in using said resources. By using its distinctive competencies, enterprises can achieve enhanced performance and competitiveness in efficiency, quality, innovation, and customer response aspects [4].

In addition to the aforementioned industry structure and resource-based arguments, elements affecting organizational performance include exploration and exploitation. Given the collective learning and resource allocation concepts in resource-based theory, organizational capabilities that equally emphasize exploration and exploitation are critical for corporate strategies and are factors of successful organization. Exploration capability focuses on exploring new opportunities, such as novel technologies, innovative business models, and novel processes or production methods. In comparison, exploitation capability focuses on current resource use and redevelopment and also emphasizes on activities such as efficiency enhancement, success replication, and project selection or implementation [5].

However, conventional resource theory suggests that enterprises should strive to accumulate and apply tangible and intangible resources (i.e. technology, funds, and talent) and to convert these resources into their own capabilities [6]. Anthropologist Claude Lévi-Strauss proposed the concept of resource bricolage in the book *The Savage Mind* in 1968. By using the three methods of resource bricolage—resources at hand, making-do, and resource recombination—small-scale enterprises with scarce resources can cleverly piece together or leverage current resources to convert disadvantages into advantages and innovate within disadvantages [7].

This study extended the resource-based view and combined changes in the current competitive environment to expand the resource-based view from an enterprise’s internal sections to external ones, such as customers, competitors, suppliers, industrial ecosystems, or even cross-industry resources. This enables enterprises to employ the advantage of internal resource capabilities with a broader macro resource-based view and strategic vision to reconfigure and recombine resource advantages for leverage. Therefore, enterprises can develop organizational ambidexterity by forming alliances in the industrial ecosystem to conduct exploration and exploitation. Open business environments and innovation networking are key characteristics of the current economic development. By extending its exploration and exploitation efforts to external sections, enterprises can overcome resource constraints and acquire new knowledge from external innovation networks. This promotes enterprises’ enhanced use of knowledge in

external environments.

3. Research Theory

This study primarily employed resources orchestration, boundary-spanning capability, and organization ambidexterity from the leadership theory to explain how the founders of GD employed disruptive thinking to deconstruct and reconstruct the preexisting industry chain and spearhead cross-industry cooperation and resource bricolage from its foundation as a green building material social enterprise to overcome resource constraints. GD explored and exploited organizational innovation activities, reconfigured and recombined resource advantages, and developed organizational ambidexterity to achieve sustainable development.

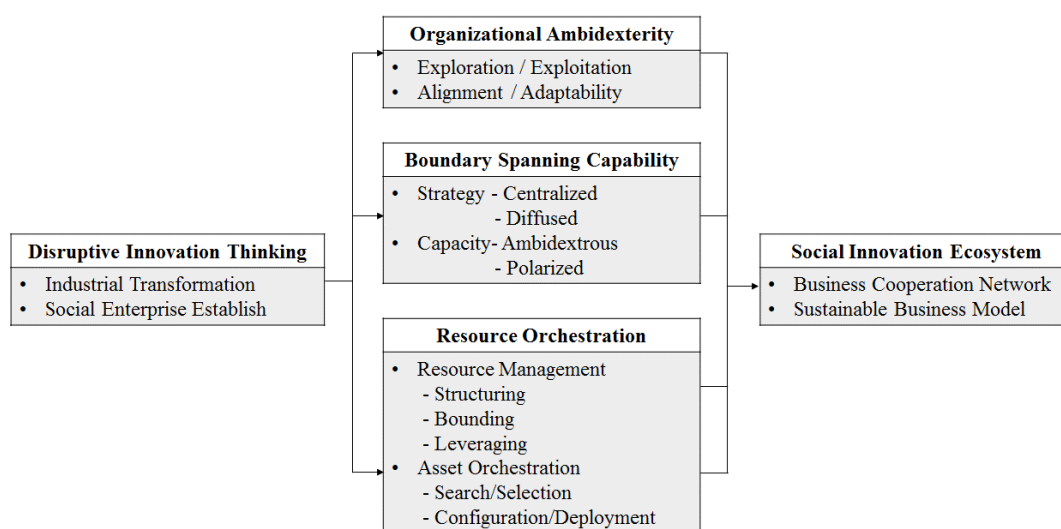


Fig. 1. Innovation process of case company.

3.1. Resource Orchestration

Competition is normal for enterprises' growth process, and gaining advantages is the law of competition. To gain competitive advantages, conventional resource theory advises that enterprises should strive to accumulate and apply tangible and intangible resources (e.g. technology, funds, and human resources and talent) and convert the resources into capabilities. Because these capabilities are difficult to be replicated by opponents, enterprises adopt these capabilities to establish sustainable advantages and become strong market competitors. By contrast, small-scale enterprises possess insufficient technology, funds, and human resources and talent; they are inevitably weak competitors at the mercy of the strong. The disadvantaged is a relative concept. The disadvantaged are not necessarily "the feeble". The disadvantaged companies still have resources and possess some core competence. However, under unfavorable circumstances, resources seem to be stretched [8]. Regardless, some views have suggested that enterprises may demonstrate excellent performance without value, rareness, imperfect limitability, and nonsubstitutability. In the 1968 book *The Savage Mind*, anthropologist Claude Lévi-Strauss proposed the concept of resource bricolage. By using resource bricolage methods, namely resource at hand, making-do, and resource recombination, small-scale enterprises with few resources can skillfully combine or leverage resources to convert disadvantages into advantages and innovate within disadvantages [7].

3.2. Boundary-Spanning Capability

In response to the increased complexity of work tasks and changing environmental conditions,

organizational must increasingly coordinate efforts across their boundaries and actively manage key external relationships to the organization itself [9]. Boundary spanning is a collection of externally oriented activities which includes managing requirement changes, negotiating project scopes, acquiring key resources, etc. Thus, external stakeholders play an important role in it. Prior researches have been largely centered on two streams: individual boundary spanners and organizational boundary-spanning strategies [10]. A boundary spanner refers to an individual who gathers information externally and disseminates it internally. In this regard, there are three key boundary spanning roles, boundary spanner as network builder, as entrepreneur, as facilitator/mediator [11]. Such individual boundary spanner must be good at both internal and external communication. Boundary spanning strategy refers to the modes or patterns of externally oriented activities that an organization demonstrates. Boundary spanning activities are implemented through organizational structures. Thus, from the structure perspective, structures have to be confirmed and established in advanced before contents can be built upon.

To bridge the difference between the individual spanners and the organizational strategies, there is a new concept "boundary spanning capacity", which is defined as the sum of every individual's technical and communication skills. This capacity reflects an organization's potential in boundary spanning [12]. As suggested by the resource-based view, the alignment of capacity and strategy can bring forth a set of business processes that bridge the internal and external boundaries. These processes then form a particular organizational boundary spanning capability [13]. If the alignment is constantly evolving, the capability can be seen as a dynamic one that enable a firm to have a better chance of establishing and maintaining competitive advantage [14].

As for the boundary spanning strategy, from the structure perspective, strategies can be identified as either centralized or diffused. In the centralized strategy, only selected individuals are responsible for external communication and all such activities are controlled by these individuals. This arrangement increases communication accuracy and reduces communication errors [15]. In contrast, in the diffused strategy, a large proportion of the team members, even the entire team, is involved in external communication. This arrangement unloads the heavy pressure on individual spanners and creates more channels for absorbing valuable information from the external environment [10].

3.3. Organizational Ambidexterity

Organizational ambidexterity refers to organizations' ability to balance strategic exploration and exploitation simultaneously [16]. James G. March divided organizations' innovation activities into exploration and exploitation and proposed that "the essence of exploitation is in the enhancement and expansion of existing competitiveness, technology, and models, and the essence of exploration is the trying of novel options." The equal emphasis on exploration and exploitation is a critical strategy for enterprises and an element of successful organizations. Exploration capacity emphasizes the exploration of new opportunities (e.g. novel technology, innovative business models, and novel processes or production methods), whereas exploitation capacity focuses on the use and redevelopment of resources and emphasizes activities such as efficiency enhancement, success replication, and project selection or implementation [5].

Today's organizations occupy a turbulent environment with rapid external changes that demand new customer markets or rapid innovation. To achieve organizational flexibility, that is, to simultaneously achieve the necessary alignment made to the external environment and adaptability. To ensure long-term success, organizations need both. Too much focus on "alignment" often causes organizations to lose their long-term vision, while an overemphasis on "adaptability" means building tomorrow's business at the cost of today. Enables the organization to retain the benefits of both "development" and "exploration", and to mediate the contradiction between two different needs in real time, in order to achieve the best

organizational performance [17], which is the spirit of an ambidextrous organization and a correct organization ability. An organization that can effectively conduct both exploration and development activities is called an ambidextrous organization.

4. Case Description and Analysis

The investigation results of ambidextrous organizational theory must ultimately be implemented into practice. For practicality, enterprises focus on methods to balance exploration and exploitation in the daily management process. In the following, the three stages of GD's business development are combined with boundary-spanning capability, resource orchestration, and organizational ambidexterity from the leadership theory to explain how GD's founders employed disruptive thinking to deconstruct and reconstruct the industry chain and spearhead cross-industry cooperation and resource bricolage from its foundation as a green building material social enterprise to overcome resource restraints. Throughout this process, GD explored and exploited organizational innovation activities, rearranged the configuration and deployment of resource advantages, and developed organizational ambidexterity to achieved sustainable development.

4.1. Energizing Physical Product Property Development

Although the conventional building materials market is comprised primarily of wood material, trees must grow for several years before being used as building materials. In comparison, bamboo can be used within 3 years after planting and is difficult to deform and damage. Moso bamboo is a native species of Taiwan and possesses advantages as a localized product that is environmentally friendly and reduces carbon. Therefore, MOSIA devoted itself to the development of bamboo-made environmentally friendly and green building materials, became the first manufacturer of "ecological green building materials" in Taiwan and the first to enter the high-end South Korea market by using wood and bamboo building materials, and successfully spread to markets in Japan, South Korea, Europe, and the United States. In the early business stages, the MOSIA's founder used marketing expertise to repackage business' products with fashionable designs to enable MOSIA's first year of revenue to become equivalent to its capital. However, external competition became increasingly fierce, which forced the founder to develop novel strategies.

Although the novel business of ecological green building material was successful, MOSIA at this time had insufficient staff and resources to recreate a "blue ocean" in the face of increasingly fierce competition. Therefore, the founder employed strategies from organizational ambidexterity theory to spearhead cross-industry cooperation, namely innovation exploration and boundary spanning, to explore novel research and development technologies, acquire key resources, and integrate external building material manufacturers to promote the widespread use of green building materials in daily life. Thus, MOSIA overcame its predicament by increasing its overall demand, which further increased its market share. Therefore, MOSIA developed technology to remove aldehyde, apply it to the substrate production process, and developed the "F0 Daily Secured Healthy Board Series." Products in this series had considerably lower formaldehyde content than the maximum threshold (0.08-ppm) stipulated by the World Health Organization. In this instance, MOSIA solved the source of the problem.

MOSIA produced and sold green building materials and also encouraged its peers to do the same. It established the Taiwan Green Building Material Council using an alliance and calling on a group of building material, furniture, and home furnishing firms to spread the use of green building materials in daily life. In brief, MOSIA aimed to steer a building material reform movement, attract manufacturers to participate in green production, establish a peaceful and sustainable coexistence relationship with nature, and promote Taiwan's valuable green building material industry.

4.2. Developing Intangible Service System Business

Despite MOSIA's promotion of healthy and nontoxic building materials, residual toxins hidden in lumber composites, plywood, glue, and paint introduced to the citizens' homes during renovation have caused many citizens to suffer from health problems and passed away. MOSIA's founder identified the market dilemma and industry gap. In 2017, MOSIA exploited and explored business model transitions under the guidance and accompaniment of the China Productivity Center. Subsequently, MOSIA established GD to reconstruct the industrial chain. By adopting the concept of "sharing" as its core, GD expanded its internal resources externally through cross-industry cooperation and pursued cooperation opportunities and resources from external partners such as customers, competitors, suppliers, or other industrial support systems. By adopting MOSIA's satisfactory resources and capability foundation, GD integrated green industry practitioners, and cooperated with industry, university, and institutional partners such as the Taiwan Green Building Material Council, National Taipei University of Technology, and the Dwell Quality Consumer Protection Association of Taiwan. Together, they established the "Three-Period, Four-Stage, Five-Review" set of green renovation services and novel certification standards. The standards encompass the three periods before, during, and after renovation; the four major stages of planning and design, building materials application and management, renovation environment management, and completion and acceptance; and the five participants of the renovation process, namely reviewers, designers, material suppliers, equipment suppliers, workers, and consumers. On-site air quality assessment is provided upon completion and records the assessment process is recorded. A comprehensive green manual documenting the building materials is issued, which lists transparent prices and compositions of the materials, thus truly achieving health popularization and price transparency.

4.3. Transforming an Internet Ambidextrous Platform Group

Based on MOSIA's green building materials and its green renovation process services and certification system, GD aimed to implement the universal values of sustainable development and healthy green renovation. The promotion and implementation of green renovation must be established throughout all consumption levels to provide every consumer with access. The organization required another change and transition; therefore, GD upgraded and formed a "green platform" to provide online and offline integrated services, integrate more firms, connect the industry and consumers, establish a "green shared economy circle," and lead the green renovation industry's into the 2.0 era. The primary service contents developed by this platform are detailed as follows:

- (1) Edit the GD green renovation certification into systematic teaching materials and recruit interior designers quarterly. The designers are required to attend 2 days or up to 16 hours of professional courses and pass the exam to qualify to practice green renovation and become a "green designer." These green designers are assigned to promote green renovation concepts through corporate entities and academic research units that share green renovation values with GD, thereby serving as advocates and loyal platform members of green renovation.
- (2) Launch the channel strategy of GD signs. Enterprises that obtained green designer licenses are encouraged to display GD signs. By the end of 2022, a total of 500 design enterprises in Taiwan are expected to display such signs, during which Taiwan will become Asia's largest physical access point for "green design."
- (3) Establish GD green renovation certification indicators. Currently, the residential version comprises 28 gold-level items and 33 platinum-level items. These indicators are adopted in dozens of construction projects in Taiwan and encompass regulations for thousands of products. In the future, control indicators will continue to be added (e.g. electromagnetic waves, energy efficiency, and

smart control) to protect consumers' health and generate countless green business opportunities.

- (4) Establish an online business-to-consumer platform website that enables consumers seeking green renovation to search for green designers online and then visit offline GD-listed design offices to engage in environment experiences. This enables green design enterprises with GD signs to easily obtain projects. The B2C green renovation online service website was established to provide industry professionals and general consumers with easy accessibility to secure and safe renovation services.

The conceptual frameworks of resource bricolage and organizational ambidexterity in leadership theory make evident that with limited resources, GD did not expand its organizational scale. Instead, the enterprise enhanced and expanded its competitiveness, technologies, and models and extended use of resources and knowledge from previously-linked cooperative alliances to explore and build a sustainable business model, namely the green shared economy circle. In addition, GD compiled the GD green renovation certification system into systematic teaching materials and trained interior designers into green designer groups to serve as its business team to promote green renovation. Thus, although GD itself does not have an interior designer, it is the largest green renovation platform in Asia. Therefore, it can be concluded that devoting equal efforts to exploration and exploitation is a critical strategy for enterprises and a factor of successful organizations.

5. Conclusion

To pursue sustainable development and to solve the long-standing gap in the health residence field, GDcometrue.com established an innovative ecosystem, Asia's first green renovation service system and "green design" sharing economic platform by reshaped the industry value chain and re-integrated stakeholders in the industry. It ultimately provides a novel solution for the gap in the global green building industry and green building material industry.

Through the macro perspective of this research, the goal is to create a competitive advantage by challenge and reshape the value co-creation of the Sustainable Business Model of the business ecosystem. The purpose of value co-creation is to explore the collective collaboration between members of the ecosystem under a given common goal. Through the activities of resource sharing and integration, in addition to expanding the collective value, it can also increase its own value and realize its own benefits. In other words, "value co-creation" represents a new management method for cross-domain cooperation. It connects stakeholders in various fields for resource sharing and integration. Through the co-creation and practice of value proposition, the partners in the ecosystem are connected for resource sharing and integration. After having a clear value proposition, we use the shaping of the environment, institutional norms, as well as the supporting and development of hardware and software, to fully implement the "green design" concept, so that each partner can connect and coordinate their actions through an agreed value proposition and appropriate institutional logic. In terms of "industrial structure", since the establishment of software and hardware supply chains, contextual environment and institutional norms, coupled with repeated interactions and adjustments among partners, a friendly partnership and a positive profit circulation model have emerged in the end. it also shaped a stable green design service ecosystem structure. In terms of "service optimization", it can be based on the increased recognition for co-creation value among partners, friendly partnerships, attracting outside players to join quickly, inducing opportunities for industry-government-academic cooperation in other regions, and then a stable green design ecosystem is established.

In the green design ecosystem, how to invite the participation and resource input of business ecosystem members with an attractive value proposition to drive a positive feedback cycle and thereby increase the

collective value of the industrial chain should have its contemporary theoretical construction necessity and significance. In the condition of resource disadvantages, three business model behavior elements, i.e. Cooperation linkage, Resource leverage, and Capability learning, are used to quickly connect the networks in the industrial ecosystem. Therefore, the members accelerating the speed to embed themselves in the emerging business ecosystem. Cooperation linkage explains that the innovation of the industrial ecosystem comes from the market information, operational knowledge and key technologies, which connected to the cooperation network, and these all increase the speed of innovation and the stability of quality. For enterprises, the more they lack competitive resources, the more it is necessary to have cooperation links to explore potential business. Resource leverage will include (1) concentrating resources on the main strategic objectives (2) effectively integrating internal and external resources of the enterprise to produce synergies; (3) constructing special assets required for industrial competition thresholds to achieve value creation and reduced costs. Capability learning refers to the more effective establishment of a cooperative network and the institutionalization of learned experiences and knowledge into organizational practices and routines through continuous learning to make up for insufficient resources. This is also a critical way to improve organizational capabilities in this new era.

This research takes the three aspects of Resources Orchestration, Boundary Spanning Capability, and Organization Ambidexterity in leadership theory to present a business case, and to provide suggestions to start-ups or SMEs as a reference for long-term development. Among them, the purpose of establishing an ambidextrous organization is to enhance the continuous innovation ability and performance of the enterprise. Therefore, studying the impact of organization ambidexterity on performance can not only test the relevant theoretical hypotheses, but also prove the necessity of organization ambidexterity research as an empirical basis for further theory research in future.

Conflict of Interest

We declare that we do not have any associative financial and personal relationships interest that represents a conflict of interest in connection with the work submitted.

Author Contributions

(1) First author make substantial contributions to research framework conception and conduct stakeholders interviews design, case description and theory analysis, interpretation.

(2) Co-Author give final approval of the version to be submitted and participate in drafting the article and revising it critically for important intellectual content.

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