Open Innovation Dynamics of Furniture Design and Function: The Difference between IKEA and Nitori

JINHYO JOSEPH YUN, XIAOFEI ZHAO, SUN AH KIM and YURI SADOI

Even though global markets are transferring from offline to online, offline sales are rapidly increasing in two top global furniture firms in Korea and Japan each—IKEA and Nitori. This study aims to answer the following research question: 'What are the differences and similarities between IKEA and Nitori in the open innovation dynamics of furniture design and function?' Diverse naturalistic qualitative research methods such as participatory observation, or focus group interviews were used. IKEA is mainly pursuing engineering open innovation strategies, including advanced furniture design with engineering knowledge, fusion with new IT and other technologies for new and innovative furniture function and design, and pursuit of creative design idea frontiers. Nitori is mainly pursuing a strategy towards customer open innovation, which is focused on domestic and regional requirements.

Keywords: Engineering open innovation, customer open innovation, IKEA, Nitori

Introduction

Research Question

Even though global markets are transferring from offline to online, there are exceptional cases in furniture industry. Offline sales are rapidly increasing in two

JinHyo Joseph Yun (corresponding author), Daegu Gyeongbuk Institute of Science and Technology (DGIST), South Korea and Organizing President of Society of Open Innovation: Technology, Market, and Complexity, South Korea. E-mail: jhyun@dgist.ac.kr
Xiaofei Zhao, DGIST and Open Innovation Academy, Daegu, South Korea.
Sun Ah Kim, Kumoh National Institute of Technology, Gumi, South Korea.
Yuri Sadoi, Meijo University, Nagoya, Aichi, Japan.

Science, Technology & Society 27: 2 (2022): 172–190
SAGE Publications Los Angeles/London/New Delhi/Singapore/Washington DC/Melbourne
DOI: 10.1177/09717218221074906

top global furniture firms in Korea and Japan each—IKEA and Nitori. In case of these two companies, many worldwide customers enjoy shopping offline rather than online environment. There were 541 offline Nitori shops with 642,273 million-yen sales in Japan on 2020 February. Japan Nitori offline shops were increased from 467 in 2019 to 541 in 2020 and 573 in 2021 even in the COVID-19 pandemic situation.[1] The IKEA Korea, which has 4 offline shops and 7 years history in Korea, arrived 660 million-dollar sales in 2020 with 32.6 per cent increase compared to 2019 even though its sales just increased 3.4 per cent in 2021 because the effect of COVID pandemic.[2]

Through several participant observations and interviews of customers, we found that customers who shop offline at IKEA and Nitori want to enjoy the creative, diverse innovations in design and function of the furniture. However, there are several differences in customer attitudes between IKEA and Nitori. To explore this issue, the present study aims to answer the following research question:

What are the differences and similarities between IKEA and Nitori in the open innovation dynamics of furniture design and function?

By opening the black-box of the open innovation dynamics of furniture design and function, the present study can contribute to develop open innovation channels for other diverse consumer products (Dul & Hak, 2007).

Research Method and Scope

The naturalist paradigm is based on the following: (a) realities are multiple and holistic, (b) knower and known are interactive, (c) only time- and context-bound working hypotheses are possible, (d) all entities are in a state of mutual simultaneous shaping and (e) inquiry is value-bound (Lincoln, 2007, p. 37). First, the research team conducted participatory observations at IKEA stores in Korea, and Nitori stores in Japan to select fifteen to twenty creative furniture items based on items that customers gave the most attention to/focused on the most the research team acted as customers in the stores. Observation has been characterised as 'the fundamental base of all research methods' in the social and behavioural sciences (Angrosino & Rosenberg, 2011). But the participatory observation has the possibility of the co-construction of knowledge that can be mined for research purposes, which can be controlled by an observer (Kothari, 2001). Our Japanese research team and Korean research team conducted four times participatory observation in three Nitori stores in Nagoya, Japan on 10, 11 and 14 May, 28 June and 7 July in 2019 to escape the weakness of participatory observation. In addition, the Korean research team conducted participatory observations at the GwangMyung IKEA on 19−23 September 2020 from 10 a.m. to 5 p.m. and at the East Busan IKEA on 26 September, 2020 as redundancy.

Second, the research team asked designers or design-oriented focus groups about the origins of the innovation in design and function of fifteen items from Nitori and twenty items from IKEA, which the research team selected based on participatory observations. A focus group interview is 'a research method involving the use of

in-depth group interviews in which participants are selected by a purposive way, or sampling of a specific population, which is different from individual interview in that it is not interview of representative group but a "focused" group on a given topic' (Rabiee, 2004). Focus groups can provide information regarding a range of ideas and feelings that individuals have about certain issues and elucidate the differences in perspectives between groups (Rabiee, 2004). The multistage focus group interview is a relevant and fruitful method in action research based on a cooperative inquiry perspective (Hummelvoll, 2008).

The Korean research team conducted focus group interviews with seven designers who are members of the East-South Design Industry association at the GyungNam Design Priority Production Innovation Centre of the Korea Institute of Design Promotion in Korea. The first interviews were conducted using a semi-structured questionnaire. The semi-structured questionnaire was organised to quantitatively and qualitatively compare the results of the interviews between the Korean and Japanese groups. Second, the Korean research team then conducted focus group interviews with twenty-two designers or design-related area workers who were selected using the snowball or chain sampling method, which identifies people of interest through people who have already responded to the same semi-structured questionnaire. This second round of interviews was conducted online from 19−28 March 2021 (Creswell & Poth, 2016).

The Japanese research team conducted focus group interviews with eighteen people with design experience and twenty-three design-related area workers from 28 March to 8 April. Two groups were conducted over ten days using a semi-structured questionnaire. The questionnaire was created based on the results of the participatory observation and used the snowball method to collect focus group members. There were two focus groups interviewed in Japan, one group included people with design experience and the other group included people who had design-related work experience, such as teaching, consulting or supporting at the design parts.

Several participatory observations were conducted at different stores to increase the possibility of selecting items that were more attractive to Nitori and IKEA customers. Furthermore, combining the results of the focus groups conducted in Korea and Japan increased the validity and value of the research findings.

Literature Review, Research Framework and Research Method

Open Innovation in New Product Development

New ideation methods including open innovation in furniture industry include two different points of accesses. The first open innovation access includes partners and venders, soliciting from the external scientific or technical community, scanning small business and business start-ups, inviting external finished product designs, external submission of ideas and external idea contests (Reis-Silva & Carrizo-Moreira, 2018). The second is known as the 'voice-of-customers', and includes

ethnographic research, customer visit teams, customer focus groups for problem detection, lead user analysis, customer or user designs, customer brainstorming, customer advisory boards or panels and a community of enthusiasts (Cooper & Edgett, 2008). When product-oriented companies face organisational challenges placing greater emphasis on services, they can move towards open innovation by working closely with customers to develop new services through diverse methods, such as customer engagement, service co-creation, elicited tacit knowledge of customers, design experience points of customers and service offerings from customers (Chesbrough, 2011). The design principles of an environment that supports collaborative design of new products and services can be realised at the open innovation factory, where methodologies and a set of tools that support the exploration of ideas, suggestions and proposals coming from different sources, both internal and external to the organisation, are constructed (Bellandi et al., 2012).

Among several knowledge translation mechanisms in open innovation, the use of design outputs, such as artefacts, sketches, visual representations and protypes, is effective for translating ideas, theoretical and technical requirements, documents and outputs into formats that can be more easily understood and appreciated by various stakeholders (Simeone et al., 2017).

During open innovation process, designers face diverse challenges in that that they can only influence the technical subsystem, namely the technology and task directly, and the social subsystems (i.e., people and structures) can only be influenced indirectly (Hallerstede, 2013). Decoupling in furniture, which occurs when customer value chains are broken apart and restructured through intercepting by disruptive innovation firms, could be the classical new combination between technology and market over the boundary of firms, to meet new requirements from customers (Teixeira & Piechota, 2019).

Open Innovation in the Furniture Industry in Design and Function

At present, design enterprises are pursuing creative open innovation through diverse outsourcing (Hong & Kim, 2020). Several similar examples of SMEs can be found by identifying digital transformation paths in the SME business model (Priyono et al., 2020). In fact, most furniture firms encourage supplier involvement in the collaborative new product development process (Reis-Silva & Carrizo-Moreira, 2018). As a low-tech, labour-intensive and supplier-dominated industry, the wooden furniture industry's pattern of innovation is widely acknowledged as business-driven and characterised by the collective innovation of suppliers, customers, competitors and retailers (Ng & Thiruchelvam, 2012). Firms in the furniture sector must produce high-quality market research to learn customers' needs and the marketing environment to meet the necessary production quality levels and remain strong in a competitive environment (Zhao, 2005).

Traditionally, the furniture industry has been dominated by buyer-driven commodity chains in which large retailers, brand-name merchandise and physical trade companies have played a central role in shaping decentralised production

networks (Avdasheva, 2007). However, manufacturer-retailer companies, such as Furniture Brands International, La-Z-Boy, Ethan Allen, Bassett, Herman, Miller and IKEA, have been appearing in the US furniture industry. These companies control both the production and distribution processes not only by investing in research and development or implementing economies of scale but also controlling the complete value chain, from the design of the product to its distribution to end consumers (Murillo, 2007). In the wooden furniture industry, procuring modern technological equipment and new materials significantly affects firms' production and innovation capabilities, while also closing the innovation gap by motivating interactive learning (Parrilli et al., 2010). Among several factors of competitive advantages in the furniture industry, social factors such as green innovation and social needs are emerging (Cao & Hansen, 2006).

As design becomes an increasingly important knowledge source for innovation, collaborative innovation processes involving designers have grown in relevance, with the emergence of new paradigms, such as human-centred design, participatory design, and, especially, design thinking (Brown, 2008). Though design is a creative process, which makes it difficult to 'write the recipe', it is presently a time for design innovation, as thinking like a designer can transform the way companies develop products, services, processes and even strategies (Brei et al., 2009). As design research is evolving from a user-centred approach to co-designing, the landscape of design practice is changing to creating new domains of collective creativity (Sanders & Stappers, 2008). Open innovation motivators need better-developed design capabilities to manage innovation across organisational boundaries and meet the needs of diverse open patterns of innovation, which will vary by sector, reflecting differences in market conditions and innovation opportunities (Acha, 2008).

Open Innovation Dynamics of Nitori

As a growth track, Nitori built a single page application (SPA) in the Japanese furniture industry by in addition to the global sourcing strategy in Asia (Baek, 2009). Thus, when local Japanese industry met the global value chain, Nitori could significantly increase its potential via value chain open innovation (Kaplinsky et al., 2003; Teasley, 2014). The company's uninterrupted growth has been attributed to a dual manufacturing−retailing model, combining an international production network with an expanding range of store formats and formulas for affordable, design-led furniture and home accessories (Dawson & Mukoyama, 2013). Following the 2008 financial crisis, Nitori transitioned to a type of 'life proposal' retail model, in which the company provides consumers with a furniture scheme to help them buy furniture in addition to increasing the products' design and function quality, to respond to the low prices of foreign furniture in the domestic market (Nie et al., 2010).

Nitori was founded in 1967 and first listed on the stock exchange in 1989. It was a retail-oriented furniture company until it acquired a woodworking company, 'Nitori Furniture', in 2000, and it follows a unique business model called

'manufacturing logistic retail', which takes on the responsibilities of market research, product design, raw material acquisition, product development, manufacturing, quality checks, logistics, import, export, business transaction promotion, store management, e-commerce and customer service centres (Fast et al., 2017). Nitori's in-house designs reflect contemporary Japanese consumers' taste for sleeker, more 'modern' furniture, sometimes in the style of popular local manufacturers, but are largely made in Southeast Asia, closer to material suppliers and with low labour costs (Teasley, 2014). IKEA, however, is the largest foreign home furnishing company in Japan, which it achieved by choosing players among four types of inbound foreign direct investments are as follows: (1) empire builders who pursue leveraging core competencies in a saturated market, (2) niche players who pursue filling a local gap with differentiation through organic growth, (3) rescuers who pursue taking over ailing local companies and (4) cherry-pickers who pursue acquiring promising local SMEs. These strategies of IKEA are similar to those of Nitori (Fast et al., 2017; Magnier-Watanabe & Lemaire, 2018).

Nitori Akio, the founder of Nitori, has announced several open innovation experiences and strategies, which were embedded in Nitori during its growth. First, the company aims to catch what customers want earlier than competing companies, such as successful US furniture firms. Second, Nitori built an automated logistics warehouse only for furniture in Sapporo by bound open innovation from the Nissan logistics warehouse. Third, Nitori bought and retained the furniture manufacturing company Marumisu Woodwork in 1986, long time after it started on 1967 as a kind of value-chain strategy. Fourth, all employees, including those in the main office, are allowed to learn the fields of manufacturing and selling via a rotating workforce manufacturing system, similar to that of IBM. Fifth, all employees in the main office are encouraged to listen to the requirements of customers and employees by working at the Nitori shops on weekends (Akio, 2015, p. 156, 237, 277, 356, 360).

Ooshita Eiji also pointed out several diverse characteristics of open innovation in the managing Nitori's struggle. First, Nitori's corporate culture is based on the idea of 'Let us learn from experience', which emphasises the company's open innovation culture. Second, Nitori does not focus on invention but catching-up of idea, which emphasises open rather than closed innovation. Third, to motivate communication in the firm, Nitori emphasises 'let us call each other not by real state but by nick name', which is a strategy to motivate internal open innovation. Fourth, Nitori practices the basic philosophy taught by a guru of Japanese industries, and encourages employees to be sensitive to the firm's environment, customers' complaints and needs, and the company's social contributions. Finally, Nitori does not engage in outsourcing just for cost efficiency but for responding actively to all the requirements of the value chance as open innovation strategies when Nitori Japan and other Nitori shops are sourcing their woods and several materials from several Asia countries including India, China, Indonesia and several east-south Asia countries.

Open Innovation Dynamics of IKEA

IKEA is famous for pursuing 'democratic design'. In other words, it is a re-narration of the American Dream, or the myth that access to (stylised) commodities is the basis of individual happiness and freedom. In reality, more often than not in the past, people who really needed a more beautiful home could not afford it (DeFazio, 2004). In addition, IKEA is highly dedicated to a vision of social responsibility for a sustainable environment and economy (Dahlvig, 2011, p. 15; Norton et al., 2012). IKEA's logistics-driven packaging innovation shows the sources of open innovation in design and function in the following several aspects: (a) the supply chain perspective in packing innovation is required; (b) interactions among sub-systems must be considered; (c) interactions among subsystems over time should consider not only cost reductions but also new business opportunities; (d) packing innovation should include logistics, markets and environmental consequences in addition to packing systems; and (e) combinations of packaging solutions, supply chains and sub-systems can create the greatest potential of maximise supply chain performance (Hellström & Nilsson, 2011). IKEA pursues identity through the 'IKEA Way' and the saga of IKEA, such as red shirts and no ties, culture-making, dynamics from doers to thinkers, no manuals or documents and chaos strategy (Salzer, 1994).

IKEA, which is a stakeholder network among IKEA systems, customers, IKEA Group and Sourcing, including employees, suppliers and technology support (e.g., design, production, IT), works as homo sociologicus and homo economicus at the same time, because the IKEA culture represents a match between internal and external norms and values (Edvardsson & Enquist, 2002). All components including woods of IKEA are from worldwide global sourcing from North and East Europe at the starting in 1960s–70s to South and East Asia in 2000s–2010s. IKEA views itself not as a product retailer but as a service provider, and the company's focus is on 'solutions to real-life problems' rather than the furniture itself. Furthermore, IKEA aims to commit to its social and environmental obligations in forming 'bonds' with customers and other stakeholders through 'democratic design', or providing value for its customers through the co-creation of individualised solutions during pre-purchase customer experiences (Edvardsson & Enquist, 2011). IKEA's 100 suppliers who provide 195 items in China, and in Southeast Asia about 83 items including wood products, metal products, textiles, lightning, natural fibres, ceramics, chairs, flatline, upholstery, mixed materials, raw materials and components, had chances to develop their technologies upgrading in global value-chains by using IKEA's technological supports to improve their operational and duplicative capabilities, and more importantly, their adaptive and innovative capabilities according to date from 2010 (Ivarsson & Alvstam, 2011). IKEA transitioned its internationalisation process from rigid replication during the 1980s up to the mid-1990s, to flexible replication used up to the present, after realising that successful international expansion by means of replication required the company to allow for local exploration within the confines of the IKEA concept alongside successful sharing of practices and standard operating procedures that embodied experiential learning gained by subsidiaries

(Jonsson & Foss, 2011). Flexible replication of IKEA includes the follows: (a) change from discomfort to kindness after merging of TaskRabbit and applying the strategy to Korea IKEA customers; (b) introducing of digital catalogues with augmented reality as a strategy for active switching that uses information and communication technology; (c) expanding the online market and applying it to Korea IKEA; and (d) strategy localisation over standardisation, such as Teenager IKEA in IKEA Goyang City (Kim, 2018). The IKEA effect, which is a kind of increased valuation of self-made products, can occur when labour leads to love only by labour resulting in successful task completion, because participants saw their amateur creations as similar to expert creations (Norton et al., 2012).

'IKEA hacking', which is about playing upon the strengths of a piece (or pieces), means taking something 'off the shelf', altering it to fit one's needs to be more 'personal', and improving it more than mass marketing could. Furthermore, although DIY projects using IKEA include gaining inspiration from the packaging and assembly instructions that come with the product, IKEA hackers are also inspired by the design aesthetic of IKEA furniture (Ellnebrand, 2013; Rosner & Bean, 2009). The soft power of IKEA through storytelling or firm narratives arrives at democratic design, which includes external designers, or customers' general requirements for high quality (Kristoffersson, 2014). At IKEA, beautiful design in not limited to the more expensive end of their product range, and IKEA still faces challenges in achieving great design in the low-priced segment of its product line, which is necessary to live up to the company's vision, including functionality, because clever solutions, added benefits and multi-use products are strong features of IKEA products (Dahlvig, 2011, p. 73).

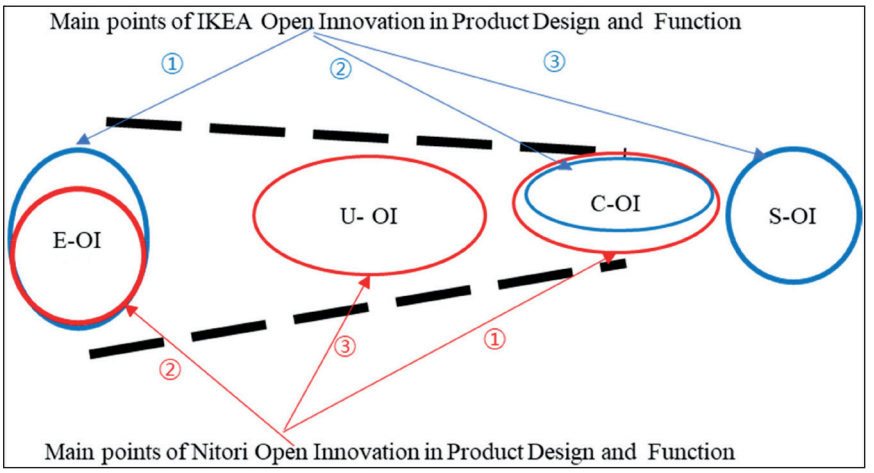
IKEA opens the democratic design centre to all customers and outsiders as an open innovation platform for anybody to join as a co-creator, and designs new products by collaborating with designers from outside in the IKEA PS collection, such as Olle Eksell, a representative graphic designer from Sweden who creates the ONSKEDROM collections (Dahlvig, 2011; Design, 2015, pp. 28−59; Lewis, 2005).

Research Framework: Open Innovation Channels for Developing New Furniture Products

Open innovation can happen at the entrance of the knowledge funnel by engineers such as the founder of Google, at the middle of the knowledge funnel by existing firms through the value chain, at the end of the knowledge funnel by customers through fascinated consumer habits, or over the knowledge funnel by social entrepreneurs through social requirements such as meeting value creation (Chesbrough, 2003, p. 16, 31, 44; Yun, 2017, p. 156). Furthermore, design innovation in the furniture industry is a type of business model innovation through a rectangular compass, if it is from the perspective of open innovation with mechanism design (Yun & Zhao, 2020).

According to a literature review on open innovation of furniture design, there will be differences between IKEA and Nitori. The research framework is presented in Figure 1.

Figure 1
Main Points in the Knowledge Funnel for the Open Innovation Dynamics of Furniture Design



Source: Created by the authors.

First, IKEA will engage in open innovation in furniture design and function from an engineering perspective, or engineer open innovation(E-OI) with other technology, external designers such as the IKEA PS category and IKEA 365 category, wireless power charging collection, as shown in Figure 1. IKEA will focus on engineering in relation to open innovation because IKEA started to produce its own furniture early in the firm's history. Second, IKEA will engage in open innovation in furniture design and function from the perspective of the global and domestic value chain of suppliers or users (i.e., user open innovation [U-OI]). Third, IKEA will engage in open innovation in furniture design and function from the perspective of social entrepreneurs to meet the expectations of democratic design, from the perspective of social open innovation (S-OI).

In the case of Nitori, first, it will try to primarily meet the customers' needs, as it has maintained its existence as a retailer for a long time by meeting diverse customer requirements. Second, Nitori will engage in engineer open innovation to create new customers both within and outside Japan through its own products, which will be innovated from the perspective of outside designers from IKEA or other industries such as automation of furniture warehouses. Third, Nitori will engage in open innovation by meeting the requirements or proposals from actors in furniture value chains.

Open Innovation Dynamics of Nitori Furniture in Design and Function

Four focus groups answered a semi-structured questionnaire, and the open innovation sources of fifteen Nitori items were selected by four focus group members, as shown in Table 1, based on the items that were selected most frequently in the

Table 1

Total Results of Four Focus Groups on Fifteen Innovative Nitori Items

Focus Groups	*E-OI*	*U-OI*	*C-OI*	*S-OI*	*Notes*
Small Korean group (7 designers)	1.83	0.83	12.34	0	Customer focus
Large Korean group (22 designers)	2.5	6	6.5	0	Customer engineer
Japanese group with design experience (18 designers)	4	2	8.5	0.5	Customer engineer
Japanese group with design experience (23 design-related people)	4	2	9	0	Customer engineer
Total	12.33	10.83	36	0.5	60 = 15 items × 4
Ranking	2nd	3rd	1st	4th	Among 15 items
	4 items	2 items	9 items	0 items	

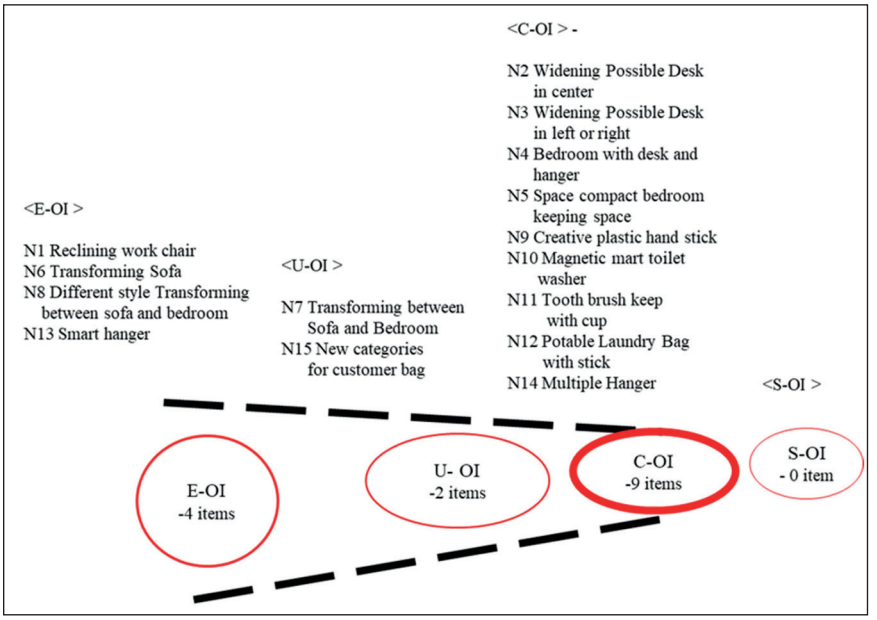
Source: Created by the authors.

focus groups. Among the fifteen Nitori items selected by participatory observation, an average of nine items were identified as the result of customer open innovation, including 12.3 items by the small Korean group, 6.5 items by the large Korean group, 8.5 items by the Japanese group with design experience and 9 items by the Japan group who are working in design related area (design marketing, design lecture and etc.) but without direct design experience. Furthermore, an average of three items were identified as the result of engineer open innovation, including 1.83 items by the small Korean group, 2.5 items by the large Korean group, 4 items by the Japanese group with design experience and 4 items by the Japanese group who are working in design related area (design marketing, design lecture and etc.) but without direct design experience. Only an average of two items were identified as the result of U-OI in the value chain, including 0.83 items by the small Korean group, 6 items by the large Korea large, 2 items by the Japanese group with design experience and 2 items by the Japanese group who are working in design related area (design marketing, design lecture and etc.) but without direct design experience.

Among the four focus groups, three groups excluding the large Korean group, indicated that nearly nine of Nitori's innovative items were from customer open innovation as shown in Figure 2, which increased the validity of the evaluation results. The following nine innovative Nitori items that evaluated to be the result of customer open innovation: furniture for small spaces including the widening possible desk in centre (N2; Because what appears to be functional is perceived to be convenient for me), widening possible desk in left or right (N3; This is a product that meets consumers' needs for wide use), bedroom with desk and hanger (N4; Because the consumer benefit of space saving is the source of innovation) and space compact bedroom keeping space (N5; User environment is the reason for the point); and small items for small conveniences in everyday life including the creative plastic hand stick (N9; It seems to be a demand from people who actually feel inconvenienced), magnetic smart toilet washer (N10; There are some minor additions of functions that seem to be based on the opinions of the users), toothbrush keep with cup (N11; The idea is for meeting the needs of consumers), portable laundry bag with stick (N12; I assumed that it was due to consumer

Figure 2

Location of Fifteen Items in the Open Innovation Knowledge Funnel for Nitori



Source: Created by the authors.

demand) and multiple hangers (N14; I always think that I cannot store my clothes neatly in hangers). When as a kind social experiment, the research team used N9, N10, N11, N12 and N14 for a while, the researcher team could not escape the use of these items every day except N9. However, N9 could be used by average Japan customers to conveniently carry plastic bags, because in Japan, nearly all citizens use plastic bags when carrying some things, including lunch boxes.

Although, based on average calculations, four items were from engineer open innovation and two items were from value chain U-OI; only two Japanese focus groups evaluated four items as being from engineering open innovation. However, regarding U-OI items, although two Japanese focus groups identified two items, the large Korean focus group identified six Nitori items as being the result of U-OI. Thus, among Nitori's innovative items, those from value chain U-OI have similar volume of items from engineering open innovation.

Furniture or items from engineer open innovation were the reclining work chair (N1; Mechanisms are favoured by the engineers and designers.; This does not use power but it came true the results), transforming sofa (N6; This is mainly pushing the design aspect), different style transforming between sofa and bedroom (N8; The engineer is making a new appeal and proposal) and smart hanger-multiple hangers for scarf and necktie (N13; The product cannot be solved without knowledge of the materials by engineer or designer).

Table 2

Total Results of Four Focus Groups on Twenty Innovative IKEA Items

Focus Groups	*E-OI*	*U-OI*	*C-OI*	*S-OI*	*A Note*
Small Korean group (7 designers)	13	1	4	2	Engineer customer
Large Korean group (22 designers)	5.5	5.5	7	2	Customer engineer/ user
Japanese group with design experienced (18 designers)	15.4	1.3	1.3	2	Engineer user/ customer
Japanese group without design experience (23 people)	13	2	4	1	Engineer customer
Total	46.9	9.8	16.3	7	80 = 20 items × 4
Ranking	1st 12 items	3rd 2 items	2nd 4 items	4th 2 items	Among 20 items

Source: Created by the authors.

Furniture or items from U-OI were the transforming between sofa and bedroom (N7; There is an advantage of inventory reduction on the supply side, but the advantage on the consumer side is weak) and new categories for customer bag or belonging keeping (N15; Inexpensive product but the level of added value is worth developing because of the needs of users and suppliers).

Open Innovation Dynamics of IKEA Furniture in Design and Function

Four focus groups discussed the open innovation sources of twenty IKEA items, which were selected by four focus group members, based on the items selected by the most members, as shown in Table 2.

Among the twenty IKEA items selected by participatory observation, an average of twelve items were identified as the result of engineer open innovation, including 13 items by the small Korean group, 5.5 items by the large Korean group, 15.4 items by the Japanese group with design experience, and 13 items by Japanese group who are working in design related area (design marketing, design lecture, etc.) but without direct design experience. An average of four items were identified as the result of customer open innovation, including 4 items by the small Korean group, 7 items by the large Korean group, 1.3 items by the Japanese group with design experience, and 4 items by the Japanese group who are working in design related area (design marketing, design lecture and etc.) but without direct design experience. Only an average of two items were identified as the result of U-OI in the value chain, including 1 item by the small Korean group, 5.5 items by the large Korean group, 1.3 items by the Japanese group with design experience, and 2 items by the Japanese group who are working in design related area (design marketing, design lecture and etc.) but without direct design experience. Only two items were identified as the result of S-OI in the value chain, including 2 items by the small Korean group, 2 items by the large Korean group, 2 items by the Japanese group with design experience, and 1 item by the Japanese group who are working in design related area but without direct design experience.

Among four focus groups, three groups excluding the large Korean group evaluated at least twelve items among twenty innovative IKEA items as resulting from engineering open innovation, as follows: innovative design furniture items from engineering knowledge, including Hammarn sofa bed for multi-usage for simple sofa and rollaway bed (I1; Because the design aspect is the main one), Friheten Sofa bed for the usage of regular sofa and regular bed (I2; The product proposes a fusion of high quality and functionality), Poang Armchair, which is a DIY chair (I5; The functional design can only be created by experts), and Nordli, which is modular drawers (I7; The product was created to reduce the number of types of furniture); technology fusion based innovative items, including Bagaren, which is an LED wall light (I10; It has high no verity), Kadrilj, which are smart blinds based on remote control and a smartphone app (I19;This is a product what proposes value through new technology from an engineer's perspective), and Tradfri, which is a smart lighting system (I20; IOT becomes new common in furniture industry); and creative design idea based items, including Rovaror, which is a small multi storage box (I3; The product has a strong sense of design), IKEA Icepack, which is a mini convenient icepack (I9; The idea of putting a container in ice to cool has been around for a long time), Gronby or Vaxbo, which are multiwall photo albums out of a rectangular structure (I11; The design aspect is the main one), Godafton, which is a lighting candle for home decoration and communication for family members (112; This is from the design aspect), and Manikin-Gestalta, which is a manikin easy holder (I18; This is a product proposed from a specialised field, Figure 3).

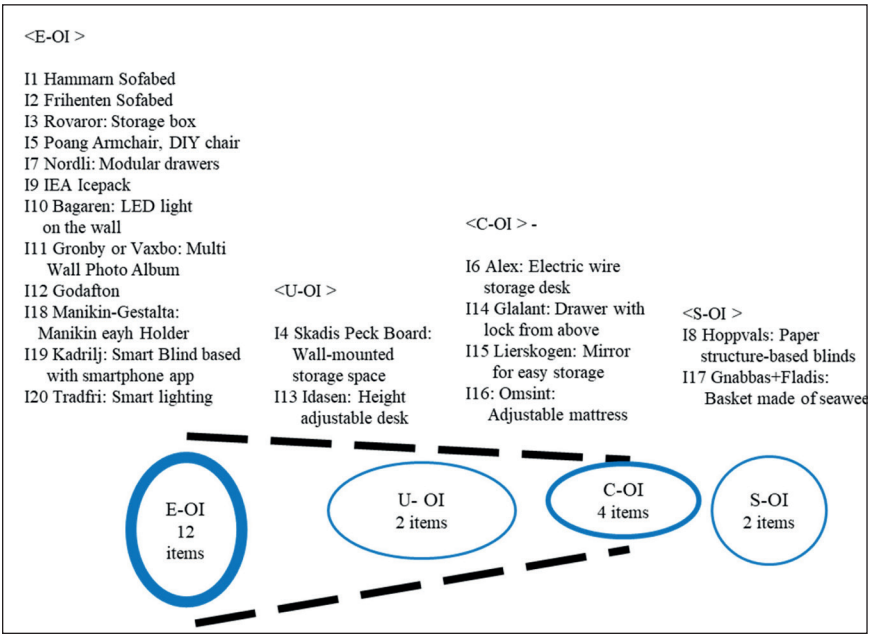
Four customer open innovation based IKEA items were not focused on compact spaces, but were for diverse, concrete customer needs such as Alex, which is an electronic wire storage desk (I6; This is from the point of assuming the users environment), Galant, which is a drawer with a locker form above (I14; I often lose my keys and end up in the wrong place at the wrong time), Lierskogen, which is a mirror for easy storage (I15; This is an idea product developed by a problem from a user), and Omsint, which is an adjustable mattress for growing children (I16; This product can adapt to the growth of children). These are general concrete requirements of customers not only in Europe but also in Asia and North America.

Two value chain U-OI based items, Skadis pegboard, which is for wall-mounted storage space (I4; There is a need, and it seems that they have pursued simpler and more convenient functions and combinations of materials), and Idasen, which is a height-adjustable desk (I13; This is from the responsive to new work styles because it provides a radical solution to existing products), were identified in the focus group interviews as having social value, in that they encourage the repeated use of small household items and motivate customers to stand up at their desk to improve their health, respectively.

Finally, two items among were identified by the focus groups as being the result of S-OI: Hoppvals, which are paper structure-based blinds and an environmentally friendly product because no plastic trash is produced (I8; It is required by the society), and Gnabbas and Flads, which are baskets made from

Figure 3

Locations of Twenty Items in the Open Innovation Knowledge Funnel for IKEA



Source: Created by the authors.

seaweed that had been useless and harmful to people (I17; This is from eco-friendly idea). Two S-OI-based IKEA items in addition to two value chain use innovation-based IKEA items are producing market values and social values together.

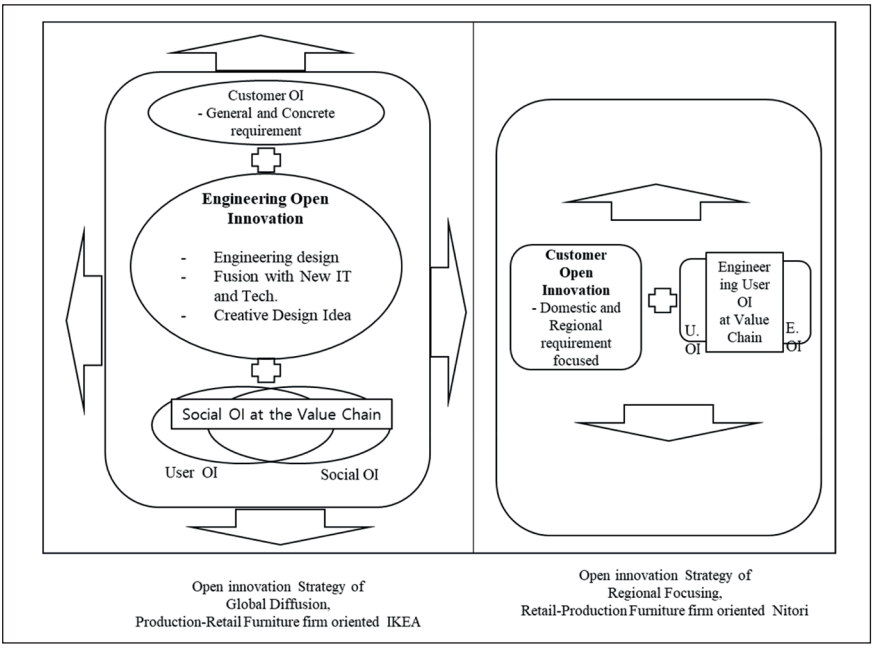
Discussion

Comparing Two Opposite Open Innovation Strategies in Furniture Design and Function

There are two opposite open innovation strategies in furniture design and function, as shown in Figure 4. If any furniture firm pursues an open innovation strategy for global diffusion, such as IKEA, which is a type of representative production within a retail parallel oriented furniture company, it should follow three open innovation strategies in furniture design and function, as shown on the left side of Figure 4. The first open innovation strategy for global diffusion is pursuing engineering open innovation strategies, including advanced furniture design with engineering knowledge, fusion with new IT and other technologies for new and innovative furniture function and design, and pursuit of creative design idea frontiers. The second open innovation strategy for global diffusion is pursuing customers' general and concrete requirements, which can suit the needs of customers anywhere

Figure 4

Two Opposite Open Innovation Strategies for Furniture Design and Function



Source: Created by the authors.

in the world. The third open innovation strategy for global diffusion is pursuing not only market value but also social value with other firms in the value chain (i.e., S-OI in the value chain).

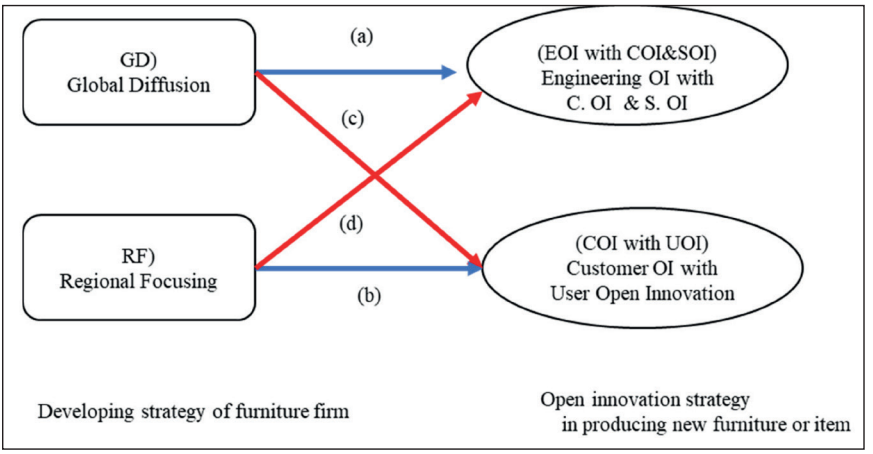
If a furniture firm pursues a regionally focused, similar to that of Nitori, which is a type of representative retail within a production parallel oriented furniture company, it should follow two open innovation strategies in furniture design and function, as shown on the right side of Figure 4. The first open innovation strategy for regional focus is pursuing a customer open innovation strategy, which is focused on domestic and regional requirements. The second open innovation strategy for regional focus is pursuing high-level innovations obtained in the furniture value chain (i.e., engineering U-OI in the value chain).

Firm Choice of Open Innovation Strategies in Producing New Furniture or Item

There are two opposite furniture firm strategies, between global diffusion such as that used by IKEA in the 2010s, and regional focus, such as that used by Nitori until the 2000s. In addition, there are two opposite open innovation strategy for producing new furniture or items between the engineering open innovation with customer open innovation and S-OI, and the customer open innovation with U-OI. A match between a furniture firm's strategy and their open innovation strategy

Figure 5

Matching between a Firm's Developing Strategy and Open Innovation Strategy in Producing New Furniture



Source: Created by the authors.

for producing new furniture or items is necessary for sustainable development, as shown in Figure 5(a) and (b).

According to its strategy, a furniture firm should pursue different product development approaches. A firm that pursues global diffusion should choose a new product development approach from engineering open innovation with general customer open innovation and S-OI combined, as shown in Figure 5(a). If this firm chooses a new product development approach from regional focused customer open innovation with regional value chain open innovation, such as in Figure 5(c), it may not be successful in global diffusion. However, a firm that pursues regional focusing should choose a new product development approach from region focused customer open innovation with regional value chain open innovation, such as in Figure 5(b). If this firm chooses a new product development approach from engineering open innovation with general customer open innovation and social value, such as in Figure 5(d), it may not be successful in its regional focus.

Conclusion

Implications

This study identified two opposite open innovation approaches to producing new furniture from the perspectives of design and function, as illustrated by IKEA and Nitori. For IKEA, high-quality engineering open innovation with a general requirement of customer and social values was found to be the basic open innovation strategy for developing new furniture and items. In the case of Nitori, regionally focused customer open innovation with regional value chain open innovation was found to be the basic

open innovation strategy for developing new furniture and items. By combining a literature review on the strategies used by IKEA and Nitori and the field research results, including participatory observation and focus group interviews and surveys, it was found that matching a firm's developing plan and open innovation strategy in new furniture production has a positive effect on the sustainability of a furniture firm.

Limitations and Future Research Directions

We have additional future research agenda from this. First, researchers want to conduct further participatory observations at the main design factories of IKEA and Nitori, and ask their opinions about the origin of the selected items, and compare their answer with the results of participatory observation and focus group interviews or surveys. The difference between main design factories, and market will give new directions to the future design of these two furniture firms.

Second, researchers want to have a chance to sum research results of these three steps, and identify similarities and differences between IKEA and Nitori in furniture design and function open innovation for the forecasting the future difference of open innovation dynamics between two furniture firms. The sum of three steps could give the additional implication for the forecasting the future directions of open innovation dynamics of these two firms.

In addition, the next research topic on furniture open innovation will be the case study on open innovation in function and design in developing new furniture or items to elucidate concrete and detail factors that can be applied to new furniture development.

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

FUNDING

This work was supported by the DGIST R&D Program of the Ministry of Science and ICT (21-IT-10-02).

NOTES

1. In Japan, IKEA is the starting period because there are only thirteen offline IKEA shops with 86,744-million-yen net sales on 2020.
2. In Korea, there is not any Nitori shop until November, 2021.

REFERENCES

Acha, V. (2008). *Open by design: The role of design in open innovation* [Paper presentation]. Academy of Management Proceedings.

Akio, N. (2015). *If you collapsed, stand up again: The warm cheering from the mentor for youth, President of Nitori* (Translation in Korean). Nikei Publishing, Inc. (original); Seoul Culture Publishing (translation).

Angrosino, M., & Rosenberg, J. (2011). Observations on observation. In N. K. Denzin and Y. S. Lincoln (Eds.), *Collecting and interpreting qualitative research* (pp. 467−478). SAGE.

Avdasheva, S. (2007). The Russian furniture industry: Firms' upgrading according to the value-chain theory. *Competition & Change*, *11*(4), 307−328.

Baek, J.-Y. (2009). The growth tracks of Nitori made SPA establish in the Japanese furniture industry: The global sourcing strategy in Asia. *Izumiya General Laboratory Quarterly*, *77*, 36−43.

Bellandi, V., Ceravolo, P., Damiani, E., Frati, F., Maggesi, J., & Zhu, L. (2012). *Exploiting participatory design in open innovation factories* [Paper presentation]. 8th International Conference on Signal Image Technology and Internet Based Systems.

Brei, D., Frecker, M., & Slocum, A. (2009). Time for design innovation. *Journal of Mechanical Design*, *131*(3).

Brown, T. (2008). Design thinking. *Harvard Business Review, 86*(6), 84.

Cao, X., & Hansen, E. N. (2006). Innovation in China's furniture industry. *Forest Products Journal*, *56*(11/12), 33.

Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.

Chesbrough, H. W. (2011). Bringing open innovation to services. *MIT Sloan Management Review*, *52*(2), 85.

Cooper, R. G., & Edgett, S. (2008). *Ideation for product innovation: What are the best methods?* (Product Innovation Best Practices Series, Reference Paper 29). Product Development Institute.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE.

Dahlvig, A. (2011). *The IKEA edge: Building global growth and social good at the world's most iconic home store*. McGraw Hill Professional.

Dawson, J., & Mukoyama, M. (2013). *Global strategies in retailing: Asian and European experiences*. Routledge.

DeFazio, K. (2004). IKEA and democracy as furniture. *Nature, Society, and Thought*, *17*(2), 143.

Design, N. (2015). KAWAZUNI IRARENAI IKEA NO DESIGN (Translation in Korean). Nikkei Business Publications.

Dul, J., & Hak, T. (2007). *Case study methodology in business research*. Routledge.

Edvardsson, B., & Enquist, B. (2002). 'The IKEA saga': How service culture drives service strategy. *Service Industries Journal*, *22*(4), 153−186.

Edvardsson, B., & Enquist, B. (2011). The service excellence and innovation model: Lessons from IKEA and other service frontiers. *Total Quality Management & Business Excellence, 22*(5), 535−551.

Ellnebrand, R. (2013). *Remake Ikea-Ideer Och inspiration for en egen stil* (Translation in Korean, 2015). Columbus Forlag AB (Translation, Samho Media).

Fast, A., Chang, J., Nguyen, N., Imai, Y., & Stoner, Z. (2017). Marketing plan. Nitori, Tyoke.

Hallerstede, S. H. (2013). Open innovation platforms. In *Managing the lifecycle of open Innovation platforms* (pp. 18−34). Springer Gabler.

Hellström, D., & Nilsson, F. (2011). Logistics-driven packaging innovation: A case study at IKEA. *International Journal of Retail Distribution Management*, *39*(9), 638−657.

Hong, K., & Kim, B. (2020). Open innovation competency of design enterprises to outsourcing service. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(2), 36.

Hummelvoll, J. K. (2008). The multistage focus group interview: A relevant and fruitful method in action research based on a co-operative inquiry perspective. *Norsk Tidsskr Sykepleieforskning*, *10*, 3−14.

Ivarsson, I., & Alvstam, C. G. (2011). Upgrading in global value-chains: A case study of technology-learning among IKEA-suppliers in China and Southeast Asia. *Journal of Economic Geography*, *11*(4), 731−752.

Jonsson, A., & Foss, N. (2011). International expansion through flexible replication: Learning from the internationalization experience of IKEA. *Journal of International Business Studies*, *42*(9), 1079−1102.

Kaplinsky, R., Memedovic, O., Morris, M., & Readman, J. (2003). *The global wood furniture value chain: What prospects for upgrading by developing countries* (UNIDO Sectoral Studies Series Working Paper).

Kim, B.-G. (2018). An exploratory analysis on strategic changes of furniture retailer: Focusing on IKEA and Hanssem in Korea. *The Journal of Distribution Science*, *16*(12), 33−45.

Kothari, U. (2001). Power, knowledge and social control in participatory development. In B. Cooke and U. Kothari (Eds.), *Participation: The new tyranny?* (pp. 139−152). Zed Books.

Kristoffersson, S. (2014). *Design by IKEA: A cultural history*. Bloomsbury.

Lewis, E. (2005). *Great Ikea! A brand for all the people*. Cyan Communications.

Lincoln, Y. S., & Guba, E. G. (2007). *Naturalistic inquiry*. SAGE.

Magnier-Watanabe, R., & Lemaire, J. P. (2018). Inbound foreign direct investment in Japan: A typology. *International Business Review*, *27*(2), 431−442.

Murillo, L. M. (2007). Manufacturers-retailers: The new actor in the US furniture industry. Characteristics and implications for the Chinese furniture industry. *International Journal of Industrial and Manufacturing Engineering, 1*(12), 746−749.

Ng, B.-K., & Thiruchelvam, K. (2012). The dynamics of innovation in Malaysia's wooden furniture industry: Innovation actors and linkages. *Journal of Forest Policy and Economics*, *14*(1), 107−118.

Nie, B., Zhao, F., & Yu, J. (2010). *The impact of the financial crisis on consumer behavior and the implications of retail revolution* [Paper presentation]. Orient Academic Forum, Sydney, Australia.

Norton, M. I., Mochon, D., & Ariely, D. (2012). The IKEA effect: When labor leads to love. *Journal of Consumer Psychology*, *22*(3), 453−460.

Parrilli, M., Aranguren, M., & Larrea, M. (2010). The role of interactive learning to close the 'innovation gap' in SME-based local economies: A furniture cluster in the Basque Country and its key policy implications. *European Planning Studies*, *18*(3), 351−370.

Priyono, A., Moin, A., & Putri, V. N. A. O. (2020). Identifying digital transformation paths in the business model of SMEs during the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 104.

Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society*, *63*(4), 655−660.

Reis-Silva, L. F., & Carrizo-Moreira, A. (2018). Collaborative new product development and the supplier/client relationship: Cases from the furniture industry. In J. L. Garcia-Alcaraz, G. Alor-Hernandez, A. A. Maldonado-Macias, and C. Sanchez-Ramirez (Eds.), *New perspectives on applied industrial tools and techniques* (pp. 175−195). Springer.

Rosner, D., & Bean, J. (2009). *Learning from IKEA hacking: I'm not one to decoupage a tabletop and call it a day* [Paper presentation]. SIGCHI Conference on Human Factors in Computing Systems.

Salzer, M. (1994). *Identity across borders: A study in the 'IKEA-world.'* Linköping University Electronic Press.

Sanders, E. B. N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *Co-design, 4*(1), 5−18.

Simeone, L., Secundo, G., & Schiuma, G. (2017). Knowledge translation mechanisms in open innovation: The role of design in R&D projects. *Journal of Knowledge Management*, *21*(6), 1406−1429.

Teasley, S. (2014). *When local industry meets global forces, or what we might learn from furniture manufacturing in Shizuoka, Japan* [Paper presentation]. 8th Biennial Furniture Research Group Conference at Missenden Abbey Buckinghamshire New University in 2013.

Teixeira, T. S., & Piechota, G. (2019). *Unlocking the customer value chain: How decoupling drives consumer disruption*. Currency.

Yun, J. J. (2017). *Business model design compass: Open innovation funnel to Schumpeterian new combination business model developing circle*. Springer.

Yun, J. J., & Zhao, X. (2020). Business model innovation through a rectangular compass: From the perspective of open innovation with mechanism design. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 131.

Zhao, F. (2005). Exploring the synergy between entrepreneurship and innovation. *International Journal of Entrepreneurial Behavior*, *11*(1), 25−41