

**The structural characteristics of innovation ecosystem: a fashion case**

Submitted to

*European Journal of Innovation Management*

Corresponding author

Shuyu Lin

s.lin@fashion.arts.ac.uk

## 1. Introduction

This paper aims to provide empirical evidence of interaction mechanism in open innovation system specific to aesthetic innovation in the creative sector. Strategic alliance and social capital are key theoretical underpinning of this research. This is a response to previous research stating that the link between open innovation and social capital is underdeveloped despite the line of inquiry regarding strategic alliance from a network perspective drawn substantial research attention (West et al., 2014), as well as a follow-up theoretical inquiry regarding developing linkage between open innovation and innovation ecosystems (Adner, 2006).

Previous research has examined open innovation and its related interactive mechanism then contributed to the understanding of how the network structure affects an organisation's innovation outcomes (West and Bogers, 2014). Despite those existing research effort taking from a structural perspective in particular, knowledge in the area of ecosystem dynamics and configuration appears insufficient and thus attention is needed (Spender et al., 2017). For example, evidence regarding the role of actors remains fragmented. Prior research has discussed the actor role of incubators, venture capital firms, and higher education systems in the existing literature (e.g. Simões et al., 2012; Strömsten and Waluszewski, 2012; Rubin et al., 2015), however, the role of other actors and intermediaries is still limited particularly in the creative sector. In contrast, the biopharmaceutical and technological sectors have been dominant as one of the key research contexts. For instance, the relationship between innovation creators and innovation seekers is understood in a bilateral setting where the benefits of coupled processes are often found in the context of R&D collaborations and technology alliances (Faems et al, 2010). Thus, research attention to different industries as well as various regions should be considered so that a wider picture can be drawn (Spender et al., 2017).

To complement the existing literature drawn its attention to technological innovation, this study focuses on aesthetic innovation as its main research context. Previous research has suggested that aesthetic innovation is often created in a highly interactive context known as creative clusters which involve a wide range of actors, processes and settings (Chapain et al., 2010). These creative clusters, consisting of a highly diverse group of organisations engaging in innovation, create a complex ecology of innovation mechanism through inter-organisational relationships for knowledge acquisition and exchange (Ibrahim et al., 2006; Chapain et al., 2010). However, the existing understanding drawn from a bilateral knowledge flow setting may not be deemed applicable to such complex ecology of innovation mechanism where the relationship between innovation creators and innovation seekers is beyond dyadic. Also, evidence regarding how such dynamic interactive mechanism impacts on innovation of the embedded organisations may appear insufficient. Unlike technological innovation, aesthetic innovation may expose to higher risk of knowledge leakage due to sufficient protection of aesthetic features is provided (Caves, 2000; Oakley, 2009; Stoneman, 2010). Consequently, aesthetic innovation can be either facilitated or inhibited within this open innovation setting where limited protection and dynamic knowledge flows occurring across organisations (Eikhof and Haunschild, 2007).

This paper is structured as follows. First, the literature review provides theoretical foundations that underpin this research. Drawing from theories discussed, this research then formulates two research questions sought to be answered. These two questions are:

*RQ1: What is the structural interaction between aesthetic innovation creators and seekers in the open innovation system?*

*RQ2: How does a broker negotiate relationship between aesthetic innovation creators and seekers in the open innovation system?*

Next, the research design is shown and the research method employed is presented. The following discussion section explains both structural and relational interaction mechanism embedded within the aesthetic innovation ecosystem. Lastly, this paper concludes the structural setting of configuring implicit innovation-imitation relationship in open innovation and discusses future work.

## **2. Literature review**

This section aims to examine the existing line of inquiry regarding the structural interactions between innovation creator and innovation seekers, as well as the negotiation role of a broker in the context of open innovation.

### *2.1. Research on structural interactions in open innovation*

Innovation research focuses on openness and interaction suggests that networks play an important role in shaping a firm's performance (Chesbrough, 2003). Evidence explains that relationship between the firm and its external environment is crucial (Laursen and Slater, 2006). Idea and knowledge flows are realised through inter-organisational relations implicitly presented in such open innovation framework (Chesbrough, 2003). Networks in this case are utilised as a mechanism that promotes the flows of obtaining, integrating and commercialising innovation (Vanhaverbeke, 2006).

Given evidence on the positive effect of collaborative networks on innovative performance, research explores strategic alliance and its role in creating effective network from a structural perspective (Faems et al., 2012). Existing research suggests that strategic alliances are key facilitators in knowledge flows which leads to increasing innovation diffusion and resource accessibility among the connected organisations (Dahl and Pedersen, 2004). Alliance portfolio, which refers to a firm's collection of immediate alliance partners, has been thus employed as a unit of analysis on a network level with aim to examine how the web of partners with which a focal firm connects affects innovation performance in more detail (Parise and Casher, 2003; Lavie and Miller, 2008; Jiang et al., 2010).

The resource-based view provides the theoretical foundation that underpins strategic alliance research and such theoretical construct has been integrated with the structural perspective to investigate how alliance portfolio heterogeneity affects innovation performance (Lavie, 2006). The effect of resource heterogeneity on alliance formation is investigated with the aim of explaining why inter-firm collaborations vary from case to case (Duysters and Lokshin, 2011). Research attention thus has been turned to exploring innovation performance of the focal firm and evidence suggests a positive impact of alliance portfolio heterogeneity on such innovation performance (Baum et al., 2000).

Technological innovation has again attracted extensive research effort. Empirical results have revealed that greater alliance portfolio heterogeneity enhances technological novelty of product innovations (Nieto and Santamaria, 2007). That is, higher alliance portfolio heterogeneity improves innovation performance due to the broader scope of resource sets a focal firm can access via its alliance portfolio. In contrast with a homogenous alliance, where the resource

sets possessed by partners are similar, a heterogeneous alliance allows a focal firm to exploit complementary resources within the alliance. Research further explains that advanced innovation performance results not only from wider access to heterogeneous resource sets but also from increasing opportunities that allow a focal firm to explore novel and emerging information and to exploit existing knowledge and implications. Also taking from technological perspectives, research has shown empirical evidence that firms with greater innovation and technology trajectories in the past tend to be considered more beneficial for collaborating when it comes to linkage formation for developing inter-firm innovation projects (Singh and Mitchell, 2005). In contrast, a focal firm possessing a wealth of technological knowledge may hesitate to enter alliances if the risk of knowledge leakage is high (Ahuja, 2000).

Open innovation has been originated as a linear, sequential process and then evolved into an interactive, bidirectional method underlining exchange between innovation creators and innovation seekers (Chesbrough, 2003; Enkel et al., 2009). Research focus on bidirectional resource flows or co-creation is evident with the technology-driven research context being framed (Berkhout et al., 2006; Hughes and Wareham, 2010). Two-way resource and knowledge flows is also documented in the strategic alliance literature and the benefits to focal firms are highlighted. Existing research suggests that employing alliance portfolio as a strategic tool can optimise the combination of horizontal or vertical partnership connections so that heterogeneous resource sets can be brought in and thus network advantage can be created (Baum et al., 2000). In more detail, the results suggest that alliances with upstream partners who specialise in resource and development provide better explorative opportunities for the focal firm to engage in radical innovation activities, whilst alliances with downstream partners, such as consumers, create more exploitative opportunities for product enhancement and production improvement of the existing offerings (Lavie and Rosenkopf, 2006).

In contrast with the aforementioned advantages, the risk of knowledge leakage has also been suggested by existing research. However, it has been argued that the understanding of knowledge leakage in the context of alliance portfolios is still limited in the existing literature and warrants further investigation (Duysters and Lokshin, 2011). Evidence shows that the risk of knowledge leakage is higher in the case of forming alliances horizontally with competition and is relatively lower in the case of developing vertical partnerships with upstream suppliers or downstream consumers (Duysters and Lokshin, 2011). On the contrary, empirical results have shown that alliances with competitors allow the focal firm to share resources of industry-specific knowledge as well as to create a platform for industry standard development initiatives (Kim and Higgins, 2007).

Also following the inquiry of interaction mechanism in the open innovation system, other studies have investigated the issues beyond alliance portfolio on a system level and argued that the business ecosystem should be regarded as an emerging research stream since the concept successfully accommodates ecological collaborative relationships among vertical and horizontal partners to achieve symbolic synergy for business success (Moore, 1993; Iansiti and Levien, 2004). Analogising from biology, the business ecosystem as an emerging concept has moved beyond market positioning and structure and instead broadens the discussion on innovation networks by investigating issues of symbiosis, platform and co-evolution (Hearn and Pace, 2006). With the same logic, research has explored other possible theoretical underpinnings to explain complex business environments and inter-organisational collaboration decisions (e.g. Heuer, 2011). Following this thread, existing studies have investigated innovation ecosystems by firstly characterising the external environment

according to the structure of interdependence and secondly examining the flow of inputs and outputs connecting with the focal firm within the ecosystem (Adner and Kapoor, 2010). In more detail, cross-sector collaboration has been further examined by identifying the relationships and processes involved in implementing ecosystem management (Heuer, 2011).

## *2.2. Research on structural configuration in open innovation*

Social network theory has long examined the effects of networks, including both the causes of network structures and the consequences of networks, on organisational innovation (Borgatti and Foster, 2003). Research has explored the structural aspect of social capital and suggests that innovation performance is influenced by a focal firm's ability to configure network-based innovative processes, as well as its positions and ties with the surrounding actors (Gulati, 1995; Ahuja, 2000). Taking from a structural perspective, the existing research refers a network as a cluster which comprises a set of actors connected by a set of ties, and defines a single focal actor as an ego and the rest of the actors having ties with the ego as alters (Burt, 1992). Evidence shows that such network structure results in potential advantages of resources, information, and knowledge, known as social capital of a focal firm (Bourdieu & Wacquant, 1992; Gulati, 1995).

The findings of the existing research suggest that network diversity is key to advancing social capital as the dynamics of interactions allow a focal firm to be exposed to a larger amount of relevant information and knowledge, and to share resources that can potentially facilitate knowledge creation and idea inspiration within the organisation (Capaldo, 2007). Heterogeneous social networks offer their members opportunities to collaborate due to high levels of diversity, whilst homogeneous networks inhibit such cooperation due to the similar properties of participating actors. Evidence shows that the more direct ties a firm has, the more product innovation leveraged from social capital it can create (Ahuja, 2000). In contrast with the positive effects, the negative consequences of social capital have also been examined in the existing literature (Borgatti and Foster, 2003). Research has argued that social ties can imprison participating actors and constrain the desirable innovative behaviour of a focal firm (Kim et al., 2006). This is because relational inertia is likely to occur within an established network where strong bonds are found among the focal firm and its connected partners. The easiness of collaboration with the existing partners generates lock-in effect as the uncertainty and cost of initiating and consolidating new partnerships appear unnecessary (Gargiulo and Bennis, 2000).

Structural hole theory proposes an alternative view to examine the relationship between network structure and social capital (Burt 1992; Borgatti and Foster, 2003). From a structural perspective, the benefits of information sharing derived from social networks embedded within the bridges are evident. Social capital is created by the effect of brokerage on facilitating information flow from diverse sources in particular (Burt, 1992). Research suggests that tighter collaboration is facilitated by frequent and rich information exchange among partners when structural holes are bridged (Gulati et al., 2000). Effective joint problem solving activities, critical to technological advancement, are thus realised through such collective effort between a focal firm and its connected partners (McEvily and Marcus, 2005).

In innovation particularly, the benefits of brokerage have also been highly recognised. Theoretically, brokers span the structural holes and consequently function as intermediaries who facilitate information flows and encourage innovation (Burt, 2004, 2005). In doing so, knowledge creation and acquisition can thus be facilitated among a focal firm and its connected

partners (McEvily and Zaheer, 1999). Knowledge diversity can reduce new product development cycles as the speed of processing is increased given the advanced information sharing capacity via the structural hole bridging activities. As a result, a focal firm drives its innovation based on the diverse information available to it via the brokerage effect (Borgatti and Foster, 2003). Such sources of diversity may include resources and capabilities possessed by firms, geographical regions, and market segments. In other words, diversity of nodes may increase the likelihood of overcoming resource constraints and, consequently, prosper innovation.

Empirical results, however, have suggested that negative brokerage effect may expose innovation creators to risk to certain extent (Hansen, 1999; Reagans and Zuckerman, 2001). Research indicates that structural holes create an opportunity to bridge the flow of information between two networks, yet whoever acts as a broker can be warranted to control the flows and negotiate relationships due to their roles in bringing together clusters from the opposite side of the hole (Burt, 1992). Thus, bridging structural holes may not necessarily lead to prospering innovation and, on the contrary, may inhibit the focal firm's growth of innovation (Tortoriello and Krackhardt, 2010).

### **3. Methodology**

This research intends to analyse the inter-organisational level and focuses on beyond-dyadic relations between the ego and its main imitator. The main objective here is to explore the mechanism of innovation creation and seeking between these two actors in a highly creative environment. Network research spans multiple disciplines and manifold levels of analysis (Borgatti and Foster, 2003). At the individual level, studies of how social networks influence individual creativity have been conducted in the fields of sociology, psychology and management research (Burt, 2004; Perry-Smith, 2006). Proceeding next to the group level, management scholars have investigated how social network structure within and beyond organisations influences or facilitates innovation performance (Rass et al., 2013). Prior research has also scoped its analysis unit within organisations and suggested that more innovations can be produced when organisational divisions occupy central network positions that provide better access to new knowledge developed by other units (Tsai, 2001). Finally, at the inter-organisational level, strategic management research has explored how the network structure of strategic alliance influences firm innovation (Schilling and Phelps, 2007).

#### *3.1. Research context*

This research grounded its context in the UK designer fashion sector in the creative industries. The contribution of the creative industries to economic development has been well recognised in the UK. The distinct contribution of the creative industries was first acknowledged in a document entitled Creative Task Force Mapping Documents (DCMS, 1998). This was the initial systematic attempt to define and measure the creative industries.

The definition given in this publication refers to the creative industries as “those industries which have their origin in their creativity, skill and talent which have a potential for wealth and job creation for generation and exploitation of intellectual property” (DCMS, 1998, p. 2). Gross value added (GVA), exports of services, employment, and numbers of businesses are four key measures used to estimate the contribution these industries make to the economy as a whole (DCMS, 1998). After exploring generic issues in relation to the overall impact of the creative sector, the existing research further identified thirteen industries that make up the broad UK creative economy, designer fashion being one of them (DCMS, 2001).

According to data released recently by the DCMS, the designer fashion sector has shown steady growth. It contributed £120 million in GVA to the UK and exported services to the value of £7 million in 2009 (DCMS, 2011). In 2010, the designer fashion sector accounted for 25,583 employment opportunities, which was a significant increase of approximately 39% compared with figures from the previous year. The number of creative enterprises in the designer fashion sector has also demonstrated a steady increase, despite accounting for only a small percentage of all UK enterprises (DCMS, 2011). The UK has the fourth largest designer fashion industry in the world after the US, Italy and France. UK designer fashion is unique in that Britain has a reputation for being a leader in avant-garde cutting edge fashion design and a source of fashion inspiration on a global scale (DCMS, 2001). The UK designer fashion sector consists mainly of micro and small businesses (Karra, 2008). These independent high-end designer fashion businesses have generated significant media attention due to their creativity but their growth is considerably impeded by a lack of financial resources and managerial skills to ensure business survival (DCMS, 2011; Karra, 2008).

The interactions between high-end designer fashion and the mainstream mass market have increased, blurring the boundary between these two sectors of the clothing market (Intel, 2010). The rising trend for collaborations between independent high-end designer fashion businesses and mass-market high-street fashion retailers to co-develop exclusive products has been well documented in a recent market analysis report (Intel, 2010). The product co-development was driven by the mass-market consumers who admire high-end designer fashion clothing but have insufficient disposable income to actually buy high-end garments (Verdict, 2013). Mass-market high-street retailers co-developing product with independent high-end designer fashion businesses provide an alternative for consumers to taste designer styles at affordable high-street prices.

### *3.2. Research design and data collection*

This study initiated by selecting appropriate subjects who are deemed representative for this study. Purposeful sampling was employed. A preliminary round of interviews with designer-entrepreneurs, the founder of the micro designer fashion businesses, was conducted. The preliminary set of data was collected during the fashion week in London. This was the time of the year when independent high-end designer fashion businesses gathering in London showcased their aesthetic product innovations for the upcoming season, with businesses ranging from established designer fashion organisations to emerging start-ups. Those micro high-end designer fashion businesses showcased at the trade fair venue were approached and asked to participate in this research. To gain as valid accounts as possible, semi-structured interviews were arranged so that they could take place as soon as possible after consent had been given.

For this preliminary set of data collection, 23 semi-structured interviews with respondents from the sample of independent high-end designer fashion businesses, lasting on average 30 minutes, were conducted (see Table 1). Their views were recorded on a number of core issues linked to strategic alliances with mass-market high-street fashion retailers. Interviewees' names were kept anonymous due to pre-interview agreements of anonymity. The interviews helped to define the scope and relationship of strategic alliances with the mass-market high-street fashion retailers and the result then informed the design of the data collection protocol. The second round of data collection was conducted. There were 22 semi-structured interviews being conducted and the participants covered a wider range of industry players including mass-

market high street retailers, the consulting organisations, and the public sector (see Table 2). Purposeful sampling was employed to ensure representativeness. Also, this round of data collection served an important purpose of triangulation so as to ensure research quality and trustworthiness. The interviews were all recorded and transcribed for analysis. The iterative coding and analysis process was applied. This process is important to theorise those initial presumption into solid concepts. During the synthesis process, the codes had been cycled and reassigned iteratively to make sure the codes provided the best meanings for this research. Table 3 presents two brokerage systems, facilitated by the separate brokers namely the public sector and the trend forecasting consultancy, with relevant keywords extracted from the interviews.

Insert Table 1 Here

Insert Table 2 Here

Insert Table 3 Here

#### **4. Result**

The result of this study identifies the structural interaction mechanism between aesthetic innovation creators and seekers in the open innovation system, as well as suggests the role of a broker in negotiating such relationship.

##### *4.1. Interaction mechanism: innovation creators and seekers*

The findings show that two sub-clusters are embedded within the larger open innovation system. One is led by independent high-end designer fashion businesses lead with particular focus on crafting design-driven innovation characterised with high level of originality and novelty, whilst the other is headed by mass market high street fashion retailers with particular focus on producing market-driven merchandise development generated based upon secondary source of information. A designer who owns a high-end designer fashion business shares the sources of design inspirations:

“[D3] I take inspirations from everywhere, even just daily life like people you meet and things that really inspire you, and the film, everything. I love to travel and love to go to different places meeting up with people.”

In contrast to the original approach of searching design inspirations, a mass market high street fashion retailer explains how it relies on secondary source of information:

“[F5] I as Design Director would put together some ideas showing in the power point presentation that the ideas are got from Company D [trend analysis consulting company] and style websites..... I would then ask my team to take pictures in places like high-end designer boutiques by looking at designer inspirations.”

The result shows mass market high street fashion retailers actively seek product ideas from aesthetic innovation crafted by independent high-end designer fashion businesses which are of reputation for originality through an intermediating route via brokers. It is to say that independent high-end designer fashion businesses are innovation creators whilst mass market high street fashion retailers are innovation seekers.



Evidence below has shown that resource acquisition, known as acquiring product innovation information in this case, faced fewer barriers in fashion. This is seen as a key enabler that facilitates the open innovation system identified by this research. Unlike technological innovation, aesthetic innovation relatively lacks patent protection. The visual elements of appearance is of high imitation risk once a product is launched to the marketplace. Reproducing product with similar design attributes is thus possible to imitators, known as mass market high street fashion retailers in this case. The result underneath also shows that such creator-seeker relationship between these two sub-networks is at the centre of the interaction mechanism that realises the open innovation system. A trend analyst explains how product innovation information is derived from the trade shows with fewer barriers:

“[F9] When we are going to a show we take as many images [away from it] as we can. In the trade shows, [there will] be loads of exhibitors.....We walk around, talking to designers about their collections, and basically look through all the images, then we are able to see a trend emerging. For example, say there are more hot orange colours and maybe turquoise, and we saw them in a couple of shows before and it happened in this show as well, then it must be a quite big trend for next season, because a lot of designers are using the same colour.”

A product developer from a mass-market high street retailer clarifies how product innovation information is required as valuable resource:

“[F3] A lady [trend analyst from a trend forecasting consultancy] gives us a trend presentation once a year in advance, where they present a broad colour palette and [product development] ideas.”

The results above, at the same time, outline a one-way information diffusion and suggest the role of a broker in forward-feeding information of aesthetic innovation from innovation creators to innovation seekers. Given the structural hole separating the creators from the seekers, the aforementioned results provide evidence of the critical position of a broker in facilitating information flows, essential to the realisation of open innovation, at the system level. From a structural perspective, creators, seekers, and brokers are three key components of this open innovation infrastructure, and the implicit innovation-imitation relationship is thus hinted within this broader open innovation mechanism.

Trend forecasting consultancies, identified as the broker from the result, are at the centre of this open innovation realisation. Evidence shows that trend forecasting consultancies collect information of aesthetic innovation, particular details of design attributes, at trade fairs and exhibitions, and later provide new product development consultancy services to the contractual partners namely the mass-market high street fashion retailers based on those collected information.

The open innovation system is established without mutual communication between innovator creators and seekers as images of aesthetic innovation is diffused via brokers, known as trend forecasting consultancies. No formal or contractual relationship is found directly between innovators and imitators and triadic closure is absent. A designer/founder suggests possible negative impact of such triadic closure absence on the designer fashion business:

“[D8] You have someone from like Company G [trend forecasting consultancy] which is taking photos of your designs. I refused to let them have my stuff because I've got a friend [product developer of a mass market high street retailer] and her job is to download Company G's trend report, copy everything, and then have them made. So she tells me, 'don't work with Company G, they are actually selling your designs on their website and making money from you'. And then those people are making money from you and you're not making a penny. It's a big problem.”

Imitators who seek information of aesthetic innovation in this case rely solely on the brokers to feed forward such information released by innovation creators. The role of the broker in open innovation realisation is to facilitate one-way resource acquisition with no present of direct connection between the two focal firms. Given the fact that the appearance of the product is the key feature of innovation, the brokering activity of diffusing product images is considered less challenging and risky. The trend forecasting consultancies are thus firstly allowed to obtain the images of aesthetic innovation without the need of developing any formal connections or contractual relationship with the innovators, known as independent high-end designer fashion businesses. Secondly, the trend forecasting consultancies continue to distribute those images of aesthetic innovation to the mass-market high-street fashion retailers, however, through a formal, contractual relationship.

#### *4.2. The role of brokers in negotiating innovation creator-seeker relationship*

The result indicates that brokers are the key enabler that facilitates the formation of triadic closure, which subsequently leads to open innovation. The cohesiveness of such open innovation system is built upon a broker's capability of bridging structural holes spanning between two focal organisations, namely the creators and the seekers, which initially show no sign of connection. An account executive working at the public sector explains its role in bridging connections:

“[F19] We launch a scheme in partnership with Company C [mass market high street fashion retailer] which awards winners [high-end independent designers] with annual financial support. This gives support financially and also provides designer connections, not only in funding but in business mentoring as well. So, it's not just about money but business support to help them [high-end independent designers].”

Evidence above shows that the public sector, identified as the broker, successfully bridges the structural holes between the independent high-end designer fashion businesses and the mass-market high-street fashion retailers, and thus facilitates direct interplay between these two focal businesses at a later time. This is evident in a series of collaborative schemes launched by the public sector that show partnerships are formed between the independent high-end designer fashion businesses and the mass-market high-street fashion retailers. The formation of such partnership are seen as the result of triadic closure based on the brokerage effect.

The findings indicates that mutual resource exchange is at the core of this triadic closure formation. The empirical data suggest that the focal firms respectively possess complementary resources to each other and thus mutual collaboration is likely to be facilitated via brokerage effect. The result shows that the independent high-end designer fashion businesses, rich in product-creativity resources but lacking process resources for successful commercialisation, expressed high levels of interest in collaborating with the mass-market high-street fashion retailers, which held plentiful resources in the processes required to launch products to market

but were in need of product creativity input. A sponsorship-winning designer explains the mutual resource exchange in detail:

“[D6] High street retailers will totally benefit from collaborating with designers as they get the signature style of a particular designer. That’s how they can benefit from it. Obviously they have some instore product developers but often they source products from individual designers..... I think it’s quite good for designers too as it achieves a certain [sales] volume.” Given evidence suggesting that brokers acting as a facilitator in bridging triadic closure for collaboration between focal firms, the result further shows that brokers also serve as a gatekeeper who consciously selects which focal firms would be allowed to enter the network. Empirical data suggest that the gatekeeping process is initiated by the public sector undertaking the role as a panel who on the one hand judges and awards independent high-end designer fashion businesses the sponsorship and on the other hand agrees partnership with high street retailers as sponsors. Through this process, the public sector partners the independent high-end designer fashion businesses with the mass market high street retailers who shares similar vision of mutual resource exchange. A sponsorship-winning designer explains:

“[D2] I started to approach the sponsorship [sponsored by the mass market high street retailer] and looked over the information that I should’ve been submitting. I then filed the application and won the award [announced] by the Council..... Some people [sponsored designers] work with Company A [the sponsor] and they produce for you [designer] and some people work with concessions, do production elsewhere and you rent a stand from them. They have a lot of different ways of working with designers.”

The above finding suggests that mutual resource exchange between the selected focal firms is at the centre of triadic closure formation. Under the aforementioned sponsorship scheme initiated by the broker, the winning independent high-end designer fashion businesses obtain not only financial support to fund new product development but also commercialisation resources that allows them to sell the newly-designed products through the outlets of the approved mass-market high-street fashion retailer who participated in this sponsorship scheme. This mutual relationship lies on the exchange of product innovation and commercialisation resources, which are possessed by the collaborating focal firms respectively.

Building upon the aforementioned results, evidence further suggests that triadic closure facilitated by broker effect can be short term and may not always lead to long term stability. Evidence shows that contractual relationship between the focal firms is prevailing and the broker continues its selection cycle on a periodic, seasonal basis. A former sponsorship-winning designer states:

“[D13] It's great to have the money behind you and you have lots of attention and people that are interested in you [through sponsorship]. It's fantastic when you first started [with the sponsorship], very good indeed. I think what was lacking is follow up [support]. London is all about new so when you are no longer new and the sponsorship ends that's when the troubles begin.”

The result shows that some independent high-end designer fashion businesses experience product imitation concerns after the partnership with the mass-market high-street retailers ends. That is, the critical new product information such as design features is shared with the partner while the triadic closure exits. When the contract ends and the triadic closure is no longer viable, knowledge leakage of design features through former collaboration is likely to encourage

product imitation. This thus causes implicit innovation-imitation mechanism and, consequently, initiates open innovation system in this sector.

## 5. Discussion

The aim of this study is to provide better understanding of the interaction mechanism in the open innovation system, with particular focus on the relationship between innovation creator and innovation seekers via the brokerage effect. Extending previous research findings with implication focussing on technological innovation (Faems, et al., 2010; Miles and Green, 2008; Stoneman, 2010), this research suggests an alternative interaction mechanism derived from the aesthetic innovation endeavour. The theoretical contribution of this paper adds to the line of inquiry regarding the structural dimension of the open innovation system and suggests a critical role of a broker in realising a one-way information diffusion from innovation creators to innovation seekers at the system level.

Given the specific research focus on aesthetic innovation, this study extends the understanding in regard to the characteristics of the aesthetic innovation flow and suggests that product ideas particularly the visual elements of design features are deemed as resource, a type of form beyond information, which can diffuse via a web of firms with limited barriers. Unlike outsourcing technological innovation, acquiring aesthetic innovation from external sources appears facing less challenges and requires no explicit contracts or licensing agreements with the original creator. Thus, opposing research on bidirectional resource flows or co-creation focusing mutual knowledge exchange (e.g. Berkhout et al., 2006; Hughes and Wareham, 2010), this paper proposes new research agenda of investigating complex interaction mechanism at the system level beyond dyadic, complementary resource exchange between creators and seekers.

Following the inquiry of regarding the innovation flow of aesthetics at the system level, this study suggests an alternative view of examining the relationship between innovation creators to innovation seekers and proposes that research attention may be drawn to the aspect of investigating innovation-imitation relationship beyond the traditional inter-organisational focus. Integrates cross-cluster features into research focus on leveraging extremal innovation sources from a structural view opens a new perspective to evaluate a focal firm's strategic network position and the viability of its innovation or imitation strategies in a holistic manner. Thus, this research proposes the proposition:

*P1: Complex interaction mechanism beyond bidirectional information flows and dyadic co-creation in open innovation facilitates the implicit innovation-imitation relationship at the system level.*

The result of this study shows that a broker occupies a strategic position that provides it advantages of negotiating relationship among the connected partners which include the partnership between the aesthetic creators and seekers. Opposing existing research suggesting a focal firm's social capital is derived from the network embeddedness (Bourdieu & Wacquant, 1992; Gulati, 1995), this research argues that a focal firm may not fully benefit from its social capital due to lacking the power of negotiating relationship which is controlled by a broker. This is likely to comprise the first-mover advantages of a foal firm engaging in creating aesthetic innovation in particular.

This study proposes that the negative effect generated by the brokerage effect on an innovative focal firm needs to be considered as one of the research streams in network studies. Given the nature of creative industries where aesthetic attributes are at the very core of value creation and value capture activities on a cyclical, seasonal basis (Howkins, 2007), broker-facilitating innovation flow at the open innovation system level is likely to increase the speed of obsolescence due to the shortened innovation life cycle promoted by the combined effect of innovation diffusion and imitation.

Power imbalance among the actors embedded in the network-based open innovation system also requires further investigation. Previous research has suggested that the risk of knowledge leakage is higher in the case of forming alliances horizontally with competition and is relatively lower in the case of developing vertical partnerships with upstream suppliers or downstream consumers (Duysters and Lokshin, 2011). This research contributes to this inquiry and suggests that how a broker exercises resource dependency among associated actors and negotiates innovation creator-seeker relationship accordingly may also pose impact on the degree of knowledge leakage risks associated to an innovation-creating focal firm. In other words, the co-creation relationship negotiated on behalf of the broker rather than the focal firm itself may cause greater concerns over imbalanced terms and conditions of partnership formation which can lead to destructive knowledge spillover. Given the tensions among brokers, innovation creators and seekers embedded in an open innovation system, this research proposes the proposition:

*P2: Aesthetic innovation creator-seeker relationship negotiated by a broker may lead to negative effect on the focal firm as an innovator.*

## **6. Conclusion**

This study draws its research attention to aesthetic innovation and contributes to the understanding of the implicit innovation-imitation relationship embedded in the open innovation system with particular focus onto the structural construct. Empirical evidence from this study provides insights into how aesthetic innovations are generated within the open innovation system and widens the application of the network theory to a wider sector beyond technological innovation. The result demonstrates a complex interaction mechanism which comprises innovation flows beyond dyadic, bidirectional co-creation. Given the asymmetric flow evident in the findings, this research highlights the controlling function of a broker when it comes to open innovation realisation and the associated negative effect on knowledge spillover that may result from a broker's role in negotiating relationships from a bridging view.

The findings of this study also suggest some future policy directions to enhance the development of the creative industries. The idea of open innovation has been recognised as a focal point in this regard. This study suggests that the public sector develops strategic endeavours in certain areas, including reassessing and adjusting partnership programmes, and evaluating the relevant network structure that promotes focal innovative creators namely micro independent designer fashion businesses in this case. This is, the controlling function of a broker generated from negotiating relationships between two separate firms or sectors needs to be taken into consideration so that the negative effect onto the innovation creator can be mitigated.

The analysis presented above is limited due to the scope of the research. Like other qualitative studies, this research is context-specific. In more detail, the data are mainly collected from the perspective of the designer fashion sector within the UK. Information from other sectors within

the creative industries, such as music and arts, has been excluded from this study. The interpretation of the data is thus highly focused on a single industry, fashion.

Therefore, knowledge produced cannot generalise to other settings and may be applied to the specific context. Despite the data lacking the breadth of wider statistically based investigations, the strength of this qualitative study lies in its ability to capture the depth of the chosen topic in its relevant context, as well as to describe complex phenomena (Corbin and Strauss, 2008). Given the limitations mentioned above, this study encourages further research to map network-based relationships in other industries of this type, both technology-driven, such as high-technology and software development, and aesthetic-led, such as the arts and media, to enhance theoretical and empirical understanding in the field.

## Reference

- Adner, R. (2006), "Match your innovation strategy to your innovation ecosystem", *Harvard Business Review*, Vol. 84 No. 4, pp. 98-104.
- Adner, R. and Kapoor, R. (2010), "Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations", *Strategic Management Journal*, Vol. 31 No. 3, pp. 306-333.
- Ahuja, G. (2000), "Collaboration networks, structural holes, and innovation: a longitudinal study", *Administrative Science Quarterly*, Vol. 45, pp. 425-455.
- Baum, J.A.C., Calabrese, T. and Silverman, B.S. (2000), "Don't go it alone: alliance network composition and startups' performance in Canadian biotechnology", *Strategic Management Journal*, Vol. 21 No. 3, pp. 267-294.
- Berkhout, A.J., Hartmann, D., van der Duin, P. and Ortt, R. (2006), "Innovating the innovation process", *International Journal of Technology Management*, Vol. 34 No. 3-4, pp. 390-404.
- Borgatti, S.P. and Foster, P. (2003), "The network paradigm in organizational research: a review and typology", *Journal of Management*, Vol. 29 No. 6, pp. 991-1013.
- Bourdieu, P. and Wacquant, L.J.D. (1992), *An Invitation to Reflexive Sociology*, University of Chicago Press, Chicago, IL.
- Burt, R.S. (2004), "Structural holes and good ideas", *American Journal of Sociology*, Vol. 110, pp. 349-399.
- Burt, R.S. (2005), *Brokerage and Closure: An Introduction to Social Capital*, Oxford University Press, Oxford.
- Burt, R.S. (1992), *Structural Holes: The Social Structure of Competition*, Harvard University Press, Cambridge, MA.
- Capaldo, A. (2007), "Network structure and innovation: the leveraging of a dual network as a distinctive relational capability", *Strategic Management Journal*, Vol. 28 No. 6, pp. 585-608.
- Caves, R.E. (2000), *Creative Industries: Contracts between Art and Commerce*, Harvard University Press, Cambridge, MA.
- Chapain, C., Cooke, P., De Propriis, L., MacNeill, L. and Mateos-Garcia, J. (2010), *Creative Clusters and Innovation: Putting Creativity on the Map*, National Endowment for Science, London.
- Chesbrough, H. (2003), "The era of open innovation", *MIT Sloan Management Review*, Vol. 44 No. 3, pp. 35-41.
- Corbin, J. and Strauss, A. (2008), *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 3rd ed., Sage, Thousand Oaks, CA.
- Dahl, M.S. and Pedersen, C.Ø.R. (2004), "Knowledge flows through informal contacts in industrial clusters: myth or reality?", *Research Policy*, Vol. 33 No. 10, pp. 1673-1686.

- Department for Culture, Media and Sport (2011), *Creative industries economic estimates*, DCMS, London.
- Department of Culture, Media and Sport. (1998), *Creative industries mapping document*, DCMS, London.
- Department of Culture, Media and Sport (2001), *Creative industries mapping document*, DCMS, London.
- Duysters, G. and Lokshin, B. (2011), "Determinants of alliance portfolio complexity and its effect on innovative performance of companies", *Journal of Product Innovation Management*, Vol. 28 No. 4, pp. 570-585.
- Eikhof, D.R. and Haunschild, A. (2007), "For art's sake! Artistic and economic logics in creative production", *Journal of Organizational Behavior*, Vol. 28 No. 5, pp. 523-538.
- Enkel, E., Gassmann, O. and ChesbroughOpen, H.W. (2009), "R&D and open innovation: exploring the phenomenon", *R&D Management*, Vol. 39 No. 4, pp. 311-316.
- Faems, D., de Visser, M., Andries, P. and van Looy, B. (2010), "Technology alliance portfolios and financial performance: value-enhancing and cost-increasing effects of open innovation", *Journal of Product Innovation Management*, Vol. 27 No. 6, pp. 785-796.
- Faems, D., Janssens, M. and Neyens, I. (2012), "Alliance portfolios and innovation performance: connecting structural and managerial perspectives", *Group & Organization Management*, Vol. 37 No. 2, pp. 241-268.
- Gargiulo, B. and Bennis, M. (2000), "Trapped in your own net? Network cohesion, structural holes and adaptation of social capital", *Organization Science*, Vol. 11 No. 2, pp. 183-196.
- Gulati, R. (1995), "Social structure and alliance formation patterns: a longitudinal analysis", *Administrative Science Quarterly*, Vol. 40 No. 4, pp. 619-652.
- Gulati, R., Norhria, N. and Zaheer, A. (2000), "Strategic networks", *Strategic Management Journal*, Vol. 21 No. 3, pp. 203-215.
- Hansen, M.T. (1999), "The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits", *Administrative Science Quarterly*, Vol. 44, pp. 82-111.
- Hearn, G. and Pace, C. (2006), "Value-creating ecologies: understanding next generation business systems", *Foresight*, Vol. 8 No. 1, pp. 55-65.
- Heuer, M. (2011), "Ecosystem cross-sector collaboration: conceptualizing an adaptive approach to sustainability governance", *Journal of Business Strategy and the Environment*, Vol. 20 No. 4, pp. 211-221.
- Howkins, J. (2007), *The Creative Economy: How People Make Money From Ideas*, Penguin, London.
- Hughes, B. and Wareham, J. (2010), "Knowledge arbitrage in global pharma: a synthetic view of absorptive capacity and open innovation", *R&D Management*, Vol. 40 No. 3, pp. 324-343.
- Iansiti, M. and Levien, R. (2004), *The Keystone Advantage: What The New Dynamics of Business Ecosystems Mean for Strategy, Innovation, and Sustainability*, Harvard Business School Press, Cambridge, MA.
- Ibrahim, S., Hosein, F.M. and Reilly, R. (2006), "Do localized clusters influence creativity of inventors?", *Creativity and Innovation Management*, Vol. 15 No. 4, pp. 410-418.
- Jiang, R.J., Tao, Q.T. and Santoro, M.D. (2010), "Alliance portfolio diversity and firm performance", *Strategic Management Journal*, Vol. 31 No. 10, pp. 1136-1144.
- Karra, N. (2008), *The UK Designer Fashion Economy Value Relationships: Identifying Barriers and Creating Opportunities for Business Growth*, NESTA, London.
- Kim, J.W. and Higgins, M.C. (2007), "Where do alliances come from? The effects of upper echelons on alliance formation", *Research Policy*, Vol. 36 No. 4, pp. 499-514.



- Kim, T., Oh, H. and Swaminathan, A. (2006), "Framing interorganizational network change: a network inertia perspective", *Academy of Management Review*, Vol. 31, pp. 704-720.
- Lavie, D. (2006), "The competitive advantage of interconnected firms: an extension of the resource-based view", *Academy of Management Review*, Vol. 31 No. 3, pp. 638-658.
- Lavie, D. and Miller, S.R. (2008), "Alliance portfolio internationalization and firm performance", *Organization Science*, Vol. 19 No. 4, pp. 623-646.
- Lavie, D. and Rosenkopf, L. (2006), "Balancing exploration and exploitation in alliance formation", *Academy of Management Journal*, Vol. 49 No. 4, pp. 797-818.
- McEvily, B. and Marcus, A. (2005), "Embedded ties and the acquisition of competitive capabilities", *Strategic Management Journal*, Vol. 26 No. 11, pp. 1033-1055.
- McEvily, B. and Zaheer, A. (1999), "Bridging ties: a source of firm heterogeneity in competitive capabilities", *Strategic Management Journal*, Vol. 20 No. 12, pp. 1133-1156.
- Miles, I. and Green, L. (2008) *Hidden Innovation in the Creative Industries*, NESTA, London.
- Mintel (2010), *Designer/Upmarket Clothing*, Mintel, London.
- Moore, J.F. (1993), "Predators and prey: a new ecology of competition", *Harvard Business Review*, Vol. 71 No. 3, pp. 175-186.
- Nieto, M.J. and Santamaria, L. (2007), "The importance of diverse collaborative networks for the novelty of product innovation", *Technovation*, Vol. 27, pp. 367-377.
- Oakley, K. (2009), "The disappearing arts: creativity and innovation after the creative industries", *International Journal of Cultural Policy*, Vol. 15 No. 4, pp. 403-413.
- Parise, S. and Casher, A. (2003), "Alliance portfolios: designing and managing your network of business-partner relationships", *Academy of Management Executive*, Vol. 17 No. 4, pp. 25-39.
- Perry-Smith, J.E. (2006), "Social yet creative: the role of social relationships in facilitating individual creativity", *Academy of Management Journal*, Vol. 49, pp. 85-101.
- Rass, M., Dumbach, M., Danzinger, F., Bullinger, A.C. and Moeslein, K.M. (2013), "Open innovation and firm performance: the mediating role of social capital", *Creativity and Innovation Management*, Vol. 22 No. 2, pp. 177-194.
- Reagans, R.E. and Zuckerman, E.W. (2001), "Networks, diversity and performance: the social capital of R&D teams", *Organization Science*, Vol. 12 No. 4, pp. 502-518.
- Rubin, T.H., Aas, T.H. and Stead, A. (2015), "Knowledge flow in technological business incubators: evidence from Australia and Israel", *Technovation*, Vol. 41-42, July-August, pp. 11-24.
- Schilling, M. and Phelps, C. (2007), "Interfirm collaboration networks and knowledge creation: the impact of large scale network structure on firm innovation", *Management Science*, Vol. 53 No. 7, pp. 1113-1126.
- Simões, J., Silva, M.J., Trigo, V. and Moreira, J. (2012), "The dynamics of firm creation fuelled by higher education institutions within innovation networks", *Journal of Science and Public Policy*, Vol. 39, No. 5, pp. 630-640.
- Singh, K. and Mitchell, W. (2005), "Growth dynamics: the bidirectional relationship between interfirm collaboration and business sales in entrant and incumbent alliances", *Strategic Management Journal*, Vol. 26, No. 6, pp. 497-521.
- Spender, J., Corvello, V., Grimaldi, M. and Rippa, P. (2017), "Startups and open innovation: a review of the literature", *European Journal of Innovation Management*, Vol. 20 No. 1, pp. 4-30.
- Stoneman, P. (2010), *Soft Innovation: Economics, Product Aesthetics, and the Creative Industries*, Oxford University Press, Oxford.



- Strömsten, T. and Waluszewski, A. (2012), "Governance and resource interaction in networks: the role of venture capital in a biotech start-up", *Journal of Business Research*, Vol. 65, No. 2, pp. 232-244.
- Tortoriello, M. and Krackhardt, D. (2010), "Activating cross-boundary knowledge: the role of Simmelian ties in the generation of innovations", *Academy of Management Journal*, Vol. 53 No. 1, pp. 167-181.
- Tsai, W.P. (2001), "Knowledge transfer intraorganizational networks: effects of network position and absorptive capacity on business unit innovation and performance", *Academy of Management Journal*, Vol. 44 No. 5, pp. 817-838.
- Vanhaverbeke, W. (2006), "The inter-organizational context of open innovation". In *Open Innovation: Researching a New Paradigm*, ed. Chesbrough, H., Vanhaverbeke, W. and West, J. pp. 205-219, Oxford University Press, Oxford.
- Verdict (2013), *Global Luxury Retailing*, Verdict, London.
- West, J., Salter, A., Vanhaverbeke, W. and Chesbrough, H. (2014), "Open innovation: the next decade", *Research Policy*, Vol. 43, pp. 805-811.
- West, L. and Bogers, M. (2014), "Leveraging external sources of innovation: a review of research on open innovation", *Journal of Product Innovation Management*, Vol. 31 No 4, pp. 814-831.

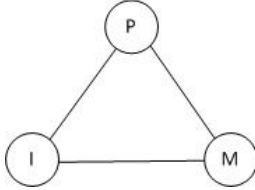
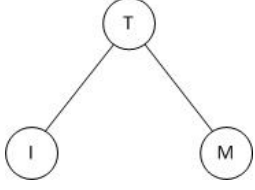
Table 1: First cycle of data collection: Interviewee ID and frequency

Interviewee ID	Position	Organisational Type	Frequency	Percent
D1, D2, D6, D9, D13	Designer/Founder	Start-up (<5 years) and sponsorship winner	5	21.8%
D3, D16, D22, D23	Designer/Founder	Start-up (<5 years)	4	17.3%
D7, D8, D10, D19, D21	Designer/Founder	Medium established (5-10 years)	5	21.8%
D4, D5, D11, D12, D14, D15, D17, D18, D20	Designer/Founder	Established (>10 years)	9	39.1%
Total			23	100%

Table 2: A wider range of fashion organisations: Interviewee ID and frequency

Interviewee ID	Position	Organisational Type	Frequency	Percent
F1, F2	-Garment Technologist -Product Developer	Mass-market garment supplier	2	9.5%
F3, F4, F5, F6, F7, F8	-Product Developer -Design Director -Buyer -Junior Buyer -Marketing Manager	Mass-market high street retailer	6	28%
F9, F10	-Trend Analyst -Founder/Director	Trend forecasting consultancy	2	9.5%
F11, F12	-Senior Account Manager -Account Manager	Public relation & creative agency	2	9.5%
F13	-Creative Director	Fashion event and talent development agency	1	5%
F14, F15	-Founder -Buyer	High-end designer fashion boutique	2	9.5%
F16, F17	-Founder -Garment Technologist	High-end fashion production company	2	9.5%
F18, F19	-Chairman -Account Executive	Public sector	2	9.5%
F20	-Account Manager	Creative business development agency	1	5%
F21	-Artist	Craft Studio	1	5%
Total			21	100%

Table 3: Two brokerage system and interview keywords

Brokerage System	Interview Keyword(s)
<p style="text-align: center;"><b>Triadic Closure</b></p>  <p><b>P:</b>Public sector  <b>I:</b> Independent high-end fashion business  <b>M:</b> Mass market high street retailer</p>	<p>Sponsorship, sponsored</p> <p>Scheme, programme</p> <p>Won, winner, awards, awarded</p> <p>Good, great, amazing</p> <p>Help, helping, helpful, support, mentor(ing)</p> <p>Work(ing) with, have people around, we come up with ideas, discuss</p> <p>Production, press, influential buyer, consultancy</p> <p>Financial, financially, funding, money</p> <p>Relationship, connections, partnership</p>
<p style="text-align: center;"><b>No Triadic Closure</b></p>  <p><b>T:</b> Trend forecasting consultancy  <b>I:</b> Independent high-end fashion business  <b>M:</b> Mass market high street retailer</p>	<p>Take images, taking designs, talking to designers</p> <p>Cover(age), covering, report, present, presentation</p> <p>Trade shows, fashion week, exhibition, shows</p> <p>Trend, commercial potential, forecasting</p> <p>New, fresh, unique</p> <p>Copy, download, selling your designs, problem</p>