New business model creation through the triple helix of young entrepreneurs, SNSs, and smart devices

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Abstract: This paper clarifies the causal paths from complex dynamic interactions among young entrepreneurs, social networking sites (SNSs), and smart devices to new SNS-based business model (BM) creation. The empirical data are collected through interviews with 102 CEOs in Korean SNS-related venture companies. Using these data, we employ the triple helix model and business model concepts to analyse how the triple helix interactions influence BM innovation. Four types of new SNS-based BMs are identified and described. Our study finds that entrepreneurs should focus their attention on combining SNS resources with smart device characteristics, helping them create value in a profitable way. Also, our study provides policymakers and venture capitalists with a holistic view of BM innovation and enables them to make better decisions on investment and policy design.

Keywords: business model; entrepreneur; social network site; SNS; smart device; triple helix model.


Biographical notes: Juneseuk Shin is an Associate Professor of Systems Management Engineering and Graduate School of Management of Technology in Sungkyunkwan University. His research interests include corporate foresight, technology/business forecasting, business model and innovation network management. He has published articles in Technovation, Technology Forecasting & Social Change, R&D Management and others.

1 Introduction

Before the introduction of smart devices, it was not easy to make a profit from personal computer (PC)-based social network sites (SNSs). Entrepreneurs created a variety of SNSs, but developed only three business models (BMs) comprising advertising, digital item sales and subscription fees (Christian et al., 2006). Recently, the landscape has changed dramatically. SNSs have created more and more synergy with smart devices including smartphones and tablet PCs, generating many potential revenue sources and
business opportunities. Subsequently, young entrepreneurs have been stimulated to create new BMs through BM innovation.

In South Korea, the number of smartphone users was one million in January 2010 with 460,000 Facebook and Twitter users. These numbers increased to 32 million smartphone users and 18 million Facebook and Twitter users by the end of 2012 (KOCCA, 2013). A number of new BMs based on SNSs and smart devices have been created, far surpassing the number of SNS BMs that existed in the PC age. Similar phenomena have been observed in many countries. For instance, Evernote, a well-known lifelogging service company, improved the freemium BM and grew rapidly to more than 30 million subscribers (SERI, 2010). New BMs have continuously emerged, creating value in a profitable way.

This notable difference is mainly due to the remarkable combination of characteristics of smart devices and the resources of SNSs. Smart devices can be characterised by 3R (real-time, reach and reality) (SERI, 2010). They overcome the limitations of space and time, transfer huge amounts of information to others and thus make communication more real. Active SNSs have many resources including social capital, human capital and large amounts of information (Batjargal, 2007). Young entrepreneurs have recognised these opportunities and have been creating new ventures based on new, innovative BMs.

Previous e-BM studies have described BMs and developed BM typologies, but cannot explain how BMs create value (Timmers, 1998; Applegate, 2001; Clemons, 2009). Strategic BM studies focus on the value creation mechanism with little regard to BM innovation (Markides and Charitou, 2004; Morris et al., 2005; Zott and Amit, 2007). Technology and innovation studies have investigated BM innovation, but are by nature firm-centric, ignoring the external actors and drivers of BM innovation (Sheehan and Stabell, 2007; Gambardella and McGahan, 2010; McGrath, 2010). The causal path from entrepreneurs to new BMs through BM innovation remains unclear. Moreover, the SNS-based BM literature is largely underdeveloped.

Through interviews, we analysed 102 SNS-relevant venture companies driven by young entrepreneurs below the age of 35 and found the typical combinatory patterns of SNS resources and smart device characteristics. We used principal component analysis to examine the importance of those resources and characteristics quantitatively. Then, we adopted the modified triple helix (henceforth TH) model to describe the creation of new BMs by young entrepreneurs. In addition to the two components mentioned above, environmental factors such as pricing mechanisms, governmental support, and venture capital comprised the third component. Analysing the interactions among SNSs, smart devices, and the external environment, we were able to identify the ways that young entrepreneurs created new BMs.

2 Literature review

2.1 Business model

Large-scale surveys, such as the IBM survey of corporate CEOs, have shown that BM innovation will eventually become more important than product or service innovation (Pohle and Chapman, 2006; IBM, 2008). Driven by growing attention, the number of research articles by both practitioners and academics has exploded. Despite substantial attention, researchers have yet to develop a widely accepted definition for BM,
suggesting a wide array of concepts. Without a common definition, the BM concept has been used to address various research questions in different contexts and in different research areas. The BM has emerged as a popular unit of analysis, but needs to be defined appropriately for each study.

Although similar concepts have existed since societies engaged in barter exchange, the BM concept became prevalent with the advent of the Internet in the mid-1990s (Amit and Zott, 2001). New information and communication technologies such as the Internet have allowed the development of new ways to create value including unprecedented exchange mechanisms, and have thus opened new horizons for the design of BMs (Amit and Zott, 2001; Dunbar and Starbuck, 2006). Focusing on e-business, scholars have identified components of e-BMs, described these components, constructed a classification hierarchy, and thus have defined the generic BM. Several e-BMs such as Google’s advertising BMs and Amazon’s mark-up-based BMs have been highlighted with the hyper-growth of those companies (Timmers, 1998; Weill and Vitale, 2001; Lumpkin and Dess, 2004). Research studying e-BMs contributes much to our understanding of new BMs, but cannot explain the causal mechanism through which new BMs and value are created.

Actually, many e-BMs create value through networks comprised of a firm and a plethora of partners (Zott et al., 2011). Attracted by this novel value creation mechanism, strategic management scholars have regarded the BM as a potential source of competitive advantage and have tried to explain the sources and processes of value creation through BMs (Markides and Charitou, 2004; Morris et al., 2005). Several empirical studies on the relationship between BMs and firm performance have revealed that novelty is crucial to both value creation and firm performance, emphasising the importance of novelty-centred BM innovation (IBM, 2006; Giesen et al., 2007; Zott and Amit, 2007). Also, these studies came to the consensus that value creation through new BMs involves complex, recursive and interactive processes by multiple players. Strategy-focused BM studies have investigated how BMs create and capture value and have thus refined BM concepts while identifying relevant activities and activity systems (Zott et al., 2011). However, the BM innovation process remains unclear. There are missing links among sources, processes, values and BMs, and a general BM definition is especially needed.

Technology and innovation management scholars have tackled this issue by trying to clarify the BM innovation process. They assumed new technologies are the source of BM innovation, saying that innovative BMs unlock the value potential embedded in new technologies, commercialise the new technologies and thus create market value and outcomes (Chesbrough and Rosenbloom, 2002; Calia et al., 2007). In other words, technological innovation and BM innovation co-evolve while interacting with each other. Others view the BM itself as a subject of innovation (Mitchell and Coles, 2003). Scholars have proposed several BM innovation processes including experimentation (McGrath, 2010), the three-step analytic processes (Sheehan and Stabel, 2007), reconfiguration of activities and capabilities (Gambardella and McGahan, 2010) and others. Although various aspects of BM innovation have been revealed, these studies all view BMs as firm-centric with little regard for external drivers of BM innovation such as government policy or social change.

Overall, the conceptual base for BMs is still thin and needs to be refined. However, a number of previous studies have suggested some common themes to be considered for empirical BM research (Zott et al., 2010). Above all, the BM concept and its core components should be defined, offering a systematic perspective on how to do business.
Also, the mechanism of value creation through BM innovation should be investigated. Last but not least, the roles of not only internal firm activities but also boundary-spanning activities driven by external factors are important and thus should be considered.

2.2 TH model

The TH model emerged to conceptualise the complex dynamics of three selection environments as a result of interactions involving bi-lateral and tri-lateral relations (Leydesdorff and Meyer, 2006). Usually, the three selection environments are specified as industry, academia and government. These institutions formerly operated at arm’s length, but have increasingly been working together within a spiral pattern of linkages emerging at various stages of the innovation process (Etzkowitz and Leydesdorff, 1995). Through the linkages, the three institutions continuously interact and are recombined. Thus knowledge is created, diffused and used, boosting successive levels of innovation. Put another way, the TH model is a way of analysing the innovation process as a recursive interaction system underlying the knowledge-based economy and focusing on three institutions (David and Foray, 2002).

The sub-dynamics of the three institutions are as important as their interactions, comprising

1. wealth generation by industry
2. novelty creation in academia
3. normative control by government (Leydesdorff and Meyer, 2006).

Any innovation can be positioned in the three-dimensional space created by the sub-dynamics (Leydesdorff and Meyer, 2006). Influenced by the three sub-dynamics and two-way or three-way interactions, innovation evolves while constructing its own trajectory (Leydesdorff and Zawdie, 2010). Thus, the TH model is appropriate to analyse knowledge-based innovation systems characterised by three functional entities as well as their dynamics and interactions.

A number of previous studies have adopted the TH model and have analysed various innovation systems including the regional innovation system (Leydesdorff and Fritsch, 2006; Lengyel and Leydesdorff, 2011) and national innovation system (Leydesdorff and Sun, 2009). Also, the TH model has been applied to the analysis of bi-lateral interactions and individual sub-dynamics including university-industry collaboration (Viale and Compodall’Orto, 2002; Shinn and Lamy, 2006), patent application (Meyer, 2006) and others. Overall, the TH model has provided heuristics for empirical innovation studies.

Despite its conceptual advantage in explaining the complex dynamics of innovation through bi-lateral and tri-lateral interactions among multiple actors, the application of the TH model has favoured university-industry-government interactions. Above all, in different innovation contexts, it is difficult not only to define key sub-dynamics with actors, but also to develop appropriate indicators of interactions among those actors. Thus, for broader empirical application, the TH model needs to be combined with other substantial methods to compensate for this weakness.
3 Research framework and methodology

Our research proceeded through three steps, as shown in Figure 1. In Step 1, we identified key actors and drivers of BM innovation through interviews with 102 CEOs of SNS-related venture companies and matched them to three TH sub-dynamics. We constructed three-dimensional TH space, which provided us with a conceptual model to investigate how TH interactions create SNS-based BM innovation. The TH model has the advantage of conceptualising complex dynamic interactions among multiple actors and was thus an appropriate model for our study.

Figure 1 Overall research framework

First, key SNS-based BM components were selected freely by CEOs. At the second stage, the CEOs were given 12 key BM components, selected by reviewing 225 relevant BM papers, and asked to add previously missing but important BM components. Using the TH model in Step 1, we identified bi-lateral and tri-lateral interactions of three TH sub-dynamics, and traced which key BM components these TH interactions changed through BM innovations. Since most respondents only partly perceived such processes, the qualitative data coding technique (Bogdan and Biklen, 1998) was used to identify the causal paths from TH interactions to the changes in BM components.

Given the causal paths from the TH to SNS-based BMs, we categorised BM innovations and BMs of 102 companies using the conceptual clustering technique. Keywords of TH actors, TH interactions, BM components, and BM component innovations were assigned to each company’s BM and BM innovation. Considering the expected strong correlation among keywords, we chose conceptual clustering rather than K-means or hierarchical clustering. Four types of SNS-based BM innovations and BMs were identified.
4 Empirical analysis

4.1 Data

Korea Technology Finance Corporation (KOTEC) provides venture companies with credit guarantees to facilitate technology financing. Thus, to get financing, most venture companies register with KOTEC’s venture portal site called venture-in. Using this database, we selected 96 SNS-related companies. We also added 38 small start-ups with creative BMs that were not registered with KOTEC, but were mentioned in eight Korean business magazines and seven IT business portal sites.

Among the 134 companies, we conducted interviews with CEOs of 102 companies between 2011 and 2012. Seventy-nine CEOs were under the age of 30, and 92 were under the age of 35. The ages of the CEOs we interviewed demonstrate that young entrepreneurs are at the centre of SNS-related businesses. The basic questionnaire was designed in Korean, including questions about actors and drivers of BM innovation and core components of their BMs. It was a semi-structured questionnaire, including 11 structured questions determined in advance. Four SNS-based BM experts developed the questionnaire and refined it using the results of pilot interviews.

The annual revenue of 73 companies was below 50,000 dollars, but the top company recorded an annual revenue of more than 30 million dollars in 2012. The top 20 companies recorded an average annual revenue of 1.9 million dollars. The average number of employees was 12 and ranged from 3 to 45. Small start-ups occupied more than 70% of total sales.

4.2 TH of SNS-based BM innovation

To identify the TH of SNS-based BM innovation, we asked CEOs to explain actors and drivers of novelty creation and wealth generation in SNS-based businesses. Multiple responses were allowed. These questions measured two sub-dynamics of the general TH model in which universities create novelty, the industry generates wealth and bi-lateral interaction creates innovation.

As shown in Table 1, respondents were almost all in agreement that young entrepreneurs driven by strong innovative entrepreneurship should be at the centre of novelty creation. Several previous studies argued that a prospective entrepreneur armed with prior experience and knowledge is more likely to recognise and create novelty (Shane, 2000; Park, 2005). In line with this view, we found that the combination of experience and market knowledge was somewhat helpful to entrepreneurs, but not critical. The role of experts was relatively limited.

Contrastingly, we found that wealth is generated not by a single dominant actor, but by combinations of several actors. Interestingly, smart devices such as smartphones and tablet PCs were regarded as important actors, creating profit opportunities from technological and market innovation. Advanced smart device characteristics boost such processes, allowing extended reach both to consumers and content creators, real-time interaction among them and augmented reality. Respondents were keenly aware that evolutionary smart devices are changing the way people find information, create and consume content and purchase all kinds of products and services.
Another important mechanism of wealth generation comes from the core function of SNSs. So far, social networks have revealed people’s interests and relationships while increasing their number of users. Using what SNSs reveal about users, respondents expected that they could find a perfect fit between consumers and content creators, and thus encourage consumers to buy the content. Thus, wealth is generated and maintained by lock-in effects. In other words, SNS consumers, creators, and content generate wealth.

**Figure 2** TH of SNS-based BM innovation
All respondents agreed that government should be the actor of normative control. For SNS-based venture companies, the Korean government makes a direct investment, facilitates financing, and creates opportunities for networking. However, 87 respondents argued that the government’s normative control can create or impede BM innovation, but that this sub-dynamic was not as strong as others. Some respondents pointed out that the government’s financial support has been directed to some specific BMs but could not lead to BM innovation. Instead of a sub-dynamic, respondents regarded the government’s normative control as an accelerating vector.

As depicted in Figure 2, three key actors are specified in the TH model of SNS-based BM innovation. Young entrepreneurs create novelty in SNS-based BMs, playing the role of academia in the general TH model. Smart devices and SNSs co-evolve while interacting with each other. Some specific combinations of SNS resources and smart device characteristics create a BM, and thus generate wealth. Therefore, wealth generation is not a typical one-dimensional sub-dynamic, but is instead a two-dimensional sub-dynamic in our model.

In Figure 2, PC-based SNS BMs lie around the origin at the bottom of the space, focusing on expanding social networks and thus attracting more subscribers. Combining extended reach on the Internet to more online users, these BMs provide SNSs with a new communication channel. A point in the PC-based SNS BM region represents a new BM. Smart device development and increasing SNS resources generate numerous opportunities for new BMs. Young entrepreneurs recognise these opportunities, construct novel combinations and create new BMs. However, the government’s normative control can accelerate or impede this entrepreneurial BM innovation process, and thus is expressed as an acceleration vector.

For instance, PC-based SNSs can limit users’ communication to when they are using PCs. However, by combining real-time smart device characteristics with previous communication resources, young entrepreneurs can identify new opportunities, add their novelty to those opportunities and create communication BMs such as that of Twitter. However, some countries regulate the communication content of sites such as Twitter, hindering their growth.

4.3 TH to BM

The TH model helps us identify actors and drivers of SNS-based BM innovation, but does not explain the BMs that are created or how these BMs create value. Thus, it is necessary to identify bi-lateral or tri-lateral interactions of the TH and then to clarify how these interactions create value, change key BM components and create new BMs. Therefore, we found the path from the TH to the BM, focusing on value creation.

As previously noted, since there is no widely accepted BM definition, recent studies have identified key BM components in research contexts and then defined their own BM concepts. Similarly, we first asked respondents what key BM components exist in SNS-related businesses. Then, given 12 frequently mentioned BM components in our literature review of 225 papers over the last decade, the respondents were allowed to add important but missing BM components to their initial answers. Multiple choices were allowed, but redundant choices were not counted.
Table 2  Key SNS-based BM components

<table>
<thead>
<tr>
<th>BM components (first stage)</th>
<th>Number of responses</th>
<th>BM components (second stage)</th>
<th>Number of responses</th>
<th>BM components (sum)</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novelty</td>
<td>92</td>
<td>Mission</td>
<td>9</td>
<td>Value creation*</td>
<td>92</td>
</tr>
<tr>
<td>Value creation</td>
<td>73</td>
<td>Offering</td>
<td>11</td>
<td>Profit model*</td>
<td>85</td>
</tr>
<tr>
<td>Revenue model</td>
<td>64</td>
<td>Strategy</td>
<td>10</td>
<td>Resource* (technology and financing)</td>
<td>72</td>
</tr>
<tr>
<td>Technology</td>
<td>55</td>
<td>Capability</td>
<td>26</td>
<td>Process*</td>
<td>61</td>
</tr>
<tr>
<td>Financing</td>
<td>54</td>
<td>Resource</td>
<td>36</td>
<td>SNS*</td>
<td>43</td>
</tr>
<tr>
<td>SNS</td>
<td>43</td>
<td>Process</td>
<td>61</td>
<td>Network (partners)</td>
<td>28</td>
</tr>
<tr>
<td>Partners</td>
<td>17</td>
<td>Network</td>
<td>11</td>
<td>Capability</td>
<td>26</td>
</tr>
<tr>
<td>Strategy</td>
<td>12</td>
<td>Value creation</td>
<td>19</td>
<td>Strategy</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Profit model</td>
<td>21</td>
<td>Customer relationship</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customer relationship</td>
<td>11</td>
<td>Offering</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supplier relationship</td>
<td>4</td>
<td>Supplier relationship</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financing</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * denotes a key SNS-based BM component.

Table 2 shows that novelty, value creation and profit models are crucial BM components. However, novelty has been regarded as one of the potential sources of value creation, and thus should be defined as a driver of BM innovation rather than a BM component (Amit and Zott, 2001). Zott and Amit (2007) examined how novelty-centred BMs have a positive effect on firm performance, emphasising this role of novelty. Value creation was targeted not only to SNS participants, but also to offline consumers and content creators. Additionally, respondents perceived that value should be created in a profitable way.

More than half of the respondents recognised the importance of resources and processes to create value and profit and said that both are necessary conditions to be met for most BMs. Respondents regarded technological and financial resources as more important than other resources. Notably, as revealed in our TH model, a SNS itself was regarded as an important resource because respondents use its resources, including participants and information, more and more as it grows. Thus, we put SNS in the resource category. Interestingly, most respondents were not aware of the importance of process in the first stage, but added it in the second stage. Rather than internal processes including design, service development and marketing, they stressed the delivery process of the customer value proposition as well as the approach process to customers and channels.

Considering these results, we defined the SNS-based BM concept as a profitable value creation and delivery mechanism using novelty, technology and SNSs. Mission and strategy are usually considered fixed or given. Classic actors including suppliers, competitors and partners are regarded as being less important. Thus, the value network including all of these actors and relationships is not very critical. The focus lies on a novel combination of technology and SNSs that creates a profit. Johnson et al. (2008)
suggested a similar but more general definition, that a BM is comprised of four interlocking components: customer value proposition, profit formula, key resources, and key processes. Our BM definition was a more focused version of Johnson’s, emphasising the role of novelty, technology push and changing social structure.

<table>
<thead>
<tr>
<th>Types of TH interactions</th>
<th>TH actors</th>
<th>BM components</th>
<th>BM components innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi-lateral interaction</td>
<td>Entrepreneur and SNS resources</td>
<td>Resource</td>
<td>New resource utilisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value creation</td>
<td>Converting existing resource to high value-added resource</td>
</tr>
<tr>
<td></td>
<td>Entrepreneur and smart device</td>
<td>Resource</td>
<td>Converting smart device characteristics to new resources</td>
</tr>
<tr>
<td></td>
<td>SNS resources and smart device</td>
<td>Resource</td>
<td>Strengthening smart device characteristics</td>
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<td></td>
<td></td>
<td>Process</td>
<td>Increasing variety of resources</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Real-time resource utilisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Augmented reality of contents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value creation</td>
<td>Extended reach both to consumers and creators</td>
</tr>
<tr>
<td>Tri-lateral interaction</td>
<td>Entrepreneur, SNS resource and smart device</td>
<td>Value creation</td>
<td>Intensified interaction</td>
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<td></td>
<td></td>
<td></td>
<td>Efficient interaction</td>
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<td></td>
<td></td>
<td></td>
<td>New communication/transaction channel</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Extended access to consumers, creators and contents</td>
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<td></td>
<td></td>
<td></td>
<td>New information/knowledge</td>
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<td></td>
<td>Specialised content/service</td>
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<td></td>
<td></td>
<td></td>
<td>New opportunities for content creation</td>
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<td></td>
<td></td>
<td></td>
<td>Technical service</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Analysis/consulting service</td>
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<td></td>
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<td>Transaction brokerage</td>
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<td></td>
<td></td>
<td></td>
<td>Content creation fee</td>
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<td></td>
<td></td>
<td></td>
<td>Channel fee</td>
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<td></td>
<td></td>
<td></td>
<td>Advertising</td>
</tr>
</tbody>
</table>

Although 53 respondents were able to explain how the TH interactions changed their BM components, the causal relationship was not clear because of many fragmented answers. Thus, using the qualitative data coding technique (Bogdan and Biklen, 1998), we recognised repeated ideas of TH-BM relationships by initial coding, identified some distinctive categories of those ideas and organised the causal paths from the TH interactions to the BM components innovation, as shown in Table 3. The qualitative coding technique provided some common types of coding categories including the situation of respondents, the views of respondents regarding environments and objects and the strategies of respondents, and thus helped us to identify common themes and patterns that emerged in interview data (Ryan and Bernard, 2003; Rubin and Rubin, 2005).
Note that bi-lateral interactions bring changes to BM resources and processes. Creating interactions between SNS resources and smart devices, entrepreneurs find and utilise new resources. Furthermore, they often make existing resources more valuable. For instance, the number of retweets was initially of little value, but then became valuable as an index of individual reputation or topic popularity. Additionally, the various combinations of SNS resources and smart device characteristics give us access to a variety of content, consumers and producers while creating new resources and processes.

However, bi-lateral interactions are not sufficient to create value in a profitable way. Smart devices and SNS resources just generate a number of opportunities. Entrepreneurs recognise such an opportunity, turn it into a value creation mechanism, and finally make the mechanism profitable. Novelty-centred tri-lateral interactions of the TH model lie at the heart of this process.

Subsequently, interactions comprised of communication and transaction become intense but efficient. Also, the direct and mediated access to consumers, creators and content through SNSs and smart devices creates not only new consumption channels, but also new value chains of content and service production. A vast amount of knowledge and information in this network is analysed and combined, continuously creating new knowledge. Consequently, value for consumers, creators, brokers and others is created.

Some entrepreneurs use profit models of e-BMs such as advertising to convert value into money. Some modify traditional offline profit models including offline transaction brokerage, and others create a new way of exploiting values such as through analysis service. However, it should be noted that the profit model is relatively underdeveloped when compared with the value creation mechanism.

4.4 New SNS-based BMs

After we successfully identified the causal paths from the TH interactions through BM innovation to the value creation of BMs in a profitable way, the question of what BMs are created remained unanswered. To categorise BMs using TH actors, TH interactions, BM components and BM component innovations in Table 3 as keywords, we assigned appropriate keywords to the BMs of 102 companies. Each BM was expressed as a keyword vector. Keyword vector-based K-means or hierarchical clustering can be used to find BM clusters, but is expected to have strong correlation among keywords due to causality. Note that there are causal relationships between TH interaction and BM component innovation. Thus, employing a conceptual clustering approach, we were able to:

1. find clusters of TH actors by eliminating, combining or subdividing keywords
2. identify clusters of BM components
3. link the former to the latter
4. classify four types of SNS-based BMs.
Considering the frequently observed keywords in each BM, we roughly visualised the moving paths from PC-based SNS models to new BMs in Figure 3. Four types of BMs were on different innovation paths in the TH space, showing the varying importance of three sub-dynamics. Obviously, Type I BM innovation was directed to utilise smart device characteristics with little regard for SNS resources, but Type II focused on utilisation of various SNS resources while modestly using smart devices. Entrepreneurs’ novelty also centred on a single aspect. Somewhat differently, Type III depended heavily on entrepreneurs rather than others. A balanced combination of three sub-dynamics was found in Type IV. The characteristics of four different BM innovations are described in greater detail below.

- **Type I BM innovation (interaction improvement)**. Using the ubiquitous technologies, Type I BM innovation improves communications and transactions mainly among SNS subscribers in terms of speed, efficiency and reality. Real-time and reality characteristics of smart devices are utilised to the maximum extent.

- **Type II BM innovation (extended access)**. Beyond SNS subscribers and internal content, a wide spectrum of offline consumers, creators and content become accessible. Type II BM innovation creates a number of direct and mediated channels among these offline components. A variety of transactions can be made through these channels. Furthermore, the channels can be transformed into value chains to produce a variety of goods and services.

- **Type III BM innovation (analysis service)**. A vast amount of knowledge and information has accumulated in various SNSs. Advanced methods of information processing and analysis such as data mining are used to analyse this information and thus create large amounts of value-added knowledge. Type III BM innovation is mainly driven by entrepreneurs’ novelty.
- **Type IV BM innovation (specialised community)** Type IV BM innovation creates new specialised communities characterised by lock-in, speciality, and active interactions. Entrepreneurs recognise such potential groups of consumers, creators and content and create pseudo-real or virtual spaces using ubiquitous technologies. Attracted to the customised speciality in this space, consumers or creators get together, make active interactions, and are locked in.

The four types of BM innovation change existing BM components or create new BM components in order to create new BMs. Note that our key SNS-based BM components consist of value creation, profit model, resource and technology. The TH innovation-driven changes in these BM components are summarised in Table 4.

**Table 4** New SNS-based BMs

<table>
<thead>
<tr>
<th>BM types</th>
<th>Value creation</th>
<th>Profit model</th>
<th>Resources</th>
<th>Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I (interaction improvement)</td>
<td>Real-time communication</td>
<td>Advertising</td>
<td>Technology</td>
<td>R&amp;D</td>
</tr>
<tr>
<td></td>
<td>Efficient communication</td>
<td>Technical service</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Augmented reality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type II (extended access)</td>
<td>Extended access to consumers, creators and contents</td>
<td>Transaction brokerage</td>
<td>SNS resources</td>
<td>New customer channel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Networked production</td>
<td></td>
<td>development</td>
</tr>
<tr>
<td>Type III (analysis service)</td>
<td>High value-added information/knowledge</td>
<td>Analysis service and consulting</td>
<td>Information/analytic</td>
<td>R&amp;D</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>technology</td>
<td>Customer relationship</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>management</td>
</tr>
<tr>
<td>Type IV (specialised community)</td>
<td>Customised speciality</td>
<td>Content creation fee</td>
<td>SNS resources</td>
<td>R&amp;D</td>
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<tr>
<td></td>
<td></td>
<td>Channel fee</td>
<td>Technology</td>
<td>New customer channel</td>
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<td></td>
<td></td>
<td>Digital items sales</td>
<td>Specialised knowledge and</td>
<td>development</td>
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<td></td>
<td></td>
<td></td>
<td>experience</td>
<td>New value chain</td>
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<td>construction</td>
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</tbody>
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The Type I BM is a technology-oriented BM, depending on previous profit models such as advertising and technical service. For instance, a venture company named Nkino enables smartphone users to communicate directly with selected SNS users and friends through smartphone backgrounds. Utilising the real-time advantages of smartphones based on its own technology, the company’s BM provides smartphone users with speedy, efficient and convenient communication. By developing a new communication algorithm, another company increased the communication speed in mobile SNS applications to surpass that of other companies. This R&D-oriented BM profits the most from technical services for other companies.
The Type II BM creates new transaction channels between creators and consumers, generating profits mainly by brokerage. Also, it creates novel value chains that are networked in the sense that goods or services are created by a combination of creators and consumers. MyRealTrip is a typical company of the Type II BM. Through various SNSs, the company finds a wide array of offline travel programs, receives consumer demands for travel, and matches a consumer to the most appropriate program. It often designs customised travel programs. Profit models of both brokerage and networked production are implemented, developing new customer channels as well as new value chains.

The Type III BM directly converts ample information and knowledge in SNSs to highly valuable knowledge or provides the user with analytic tools. Profits come mainly from analytic service, consulting and tool sales. Customer relationship management is as important as analytic software-centred R&D because customers are mostly companies and large organisations. A typical Type III BM company named TREUM analyses SNS information and knowledge using a semantic network or social network, provides companies with consulting services, and sells its own analytic software, ‘SimPL’.

Using all of the resources and processes mentioned in previous BMs, the Type IV BM creates various forms of specialised communities. Attracted to specialised content that is not available outside the community, members are easily locked in. Through these high-loyalty members, this BM makes profits using several profit models. A virtual community game named I LOVE COFFEE developed by Patti Studio is a typical example. Running their own coffee shops on smartphones, members are locked into the game while buying many digital items. They are also exposed to various advertisements. To level up the coffee shop, a member is forced to get help from other members, and cannot help but bring friends from other SNSs to this game. A list of friends of a user in other SNSs is automatically created and on offer. Members increase interactions and are locked in even more to this community, boosting the community growth.

Somewhat differently, another company named Moblog created an online community of writers, publishing their writings electronically. Writers are connected not only through this community but through other SNSs. Offline publishers make profits by selling books. Thus, books and writers are carefully chosen. However, Moblog’s profits come mainly from its publication fees. Writers are satisfied with its customised service and professional publication service and also appreciate interactions with others. The revenue source changes from readers to writers because of the SNS-based specialised community.

5 Discussion and conclusions

Driven by ubiquitous technology development, SNSs and smart devices have created many new opportunities. As was the case in the Internet age, young entrepreneurs’ novelty is crucial to convert opportunities to profits through BM innovation. Many countries set various policies in motion to stimulate such processes. Venture capitalists and large companies pay attention to such change. However, the causal path from entrepreneurs’ novelty through BM innovation to new profitable BMs remains unclear. Considering the high failure rates of e-business ventures, it is inevitable that doubts will be cast on new opportunities. Without a holistic view, young entrepreneurs will struggle to find ways to seize opportunities.
Above all, our study identifies entrepreneurs, SNSs and smart devices to be key actors of SNS-based BM innovation, meaning that entrepreneurs’ novelty should concentrate on combining SNS resources with smart device characteristics. This tri-lateral interaction lies at the heart of BM innovation, creating value in a profitable way. Note that bi-lateral interactions create mostly resources. Thus, to seize SNS-based business opportunities through BM innovation, entrepreneurs must focus on maximising such tri-lateral interactions.

Our study also provides governments, large companies and venture capitalists with a holistic view of BM innovation. Identifying the core interactions of BM innovation and types of BMs, these organisations understand the value that a BM creates and how profitable a BM is, which allows large companies and venture capitalists to make better decisions on investments. Also, policymakers can design more effective policies not only from a financial perspective, but also from a value perspective. Government control is of little importance in our study, but can become important with well-designed policy implementation. Our findings may allow the success rate of venture companies to increase.

Despite the value of our contributions, our study has several limitations, and thus there is room for further investigation. First and foremost, the causal relationship would be more obvious if we could have developed and used appropriate quantitative indicators of the TH model and the BM. The profit model especially needs to be examined in terms of financial performance. However, there were not enough profit data because most companies in our research were start-ups at an early stage of growth. The impact of BM innovation and new BMs on firm performance should be examined in the future with time-series financial data. Also, this study focused mostly on young entrepreneurs, but could not compare them with experienced entrepreneurs. Several previous BM studies have dealt with prior experience as a key factor, and thus, it is worth exploring in future studies. The effects of globalisation were not examined because most companies in our study provided local services. However, globalisation is becoming more and more important, and thus should be investigated. Last but not least, our study had severe local biases because we only examined Korean companies. Some local characteristics, including culture and infrastructure, could have affected the results. Thus, it is necessary to interview entrepreneurs from various countries to make this study more robust.

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References


New business model creation through the triple helix of young entrepreneurs


