Theorizing the relationship between business models and business ecosystems: a systematic literature review

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Abstract

There is a growing focus in business management studies on business model innovation which refers to the configuration or re-configuration of an organization’s business model as a response to its dynamic ecosystem (Foss & Saebi, 2017). Therefore, in order to deliver successful and effective business model innovation, there is a need to understand both business models and business ecosystems. This paper will systematically review of business models and business ecosystems and explore the interdependencies between to provide a critical view on business model innovation.

We start the systematic literature review from searching EBSCO’s Business Source Complete as the database. From the database, given the time period for the last 15 years between 2002 and 2017, searching business model gives the result of 12,640 academic journal papers whilst searching business ecosystem shows 324 results. The number of academic papers that contain both business model and business ecosystem is only 73 papers. From reviewing these 73 papers it transpires that few of them investigate the relationships between business models and business ecosystems; and the relationships that have been investigated are rarely conceptualized based on the general theories of business models and business ecosystems.

To fill the literature gap, this paper will review the grounding theories of the business model and business ecosystems and attempt to build connections between them based on identified key functions of each concept. The business model is defined as an organization configuration that creates and captures value (Serrat, 2012; Massa et al, 2016). Key functions of business models are identified and categorized into three parts which are value creation, value capture and configuration which reflects the general definition of the business model (Osterwalder & Pignuer, 2010; Afuah, 2014; Chesbrough & Rosenbloom, 2007). For the business ecosystem, the paper will review the key elements of business ecosystems as well as some conceptualization works from
researchers like Moore (1996) and Isenberg (2011). Then the key functions of business models and key elements of business ecosystems will be outlined together in one illustrative framework to help the mapping between these two concepts to explore the tensions between business model functions and business ecosystem elements like which business model functions may interact with which ecosystem elements and how. The mapping contributes to the academic body of work on business models and ecosystems as it theorizes and visualizes their interdependencies. As we categorized business model functions into three sections (value creation, value capture, configuration), the finding of this study argues that ecosystem elements impact all these business model sections which indicate a comprehensive connection between these two concepts. However, there are challenges of this paper that the relationships between the business models and ecosystems are theoretical and not validated in practice. This paper maps out a conceptual framework between business models and ecosystems while waiting for a future exploratory study to clarify their actual interdependencies in a specific context. Therefore, the empirical study is suggested to draw a more verified and validated relationships between business models and ecosystems and further of my Ph.D. programme will focus on Chinese football ecosystem as the context for the empirical research.

References:
Theorizing the relationship between business models and business ecosystems: a systematic literature review approach

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Abstract—This research adopts a systematic literature review approach to investigate the relationship between business models and business ecosystems. The systematic review reveals the research pattern of business model-business ecosystem study and identify the research gaps which call for the study that link business models and business ecosystems from theoretical perspectives. Thus, this paper then identifies the key functions of business models and key elements of business ecosystems and map them out in a conceptual framework. This conceptual framework theorizes and visualizes the connections between these two concepts which has generality to be applied in different sectors. However, empirical study is needed to validate this framework under specific ecosystem circumstances.

1. Introduction

There is a growing focus on the business model innovation study which refers to innovating and re-configuring organization’s business models in responding to changing business contexts (Foss & Saebi, 2017; Weiller et al, 2015). There are two concepts that are involved in business model innovation definition, which are the business model and business ecosystem. Business model innovation links these two concepts together as they innovation of an organizations’ business models requires the recognition of their business ecosystems. Therefore, to deliver an effective business model innovation, it needs to understand business model theories and business ecosystem theories as well as the interdependencies between them.

This paper selects the systematic literature review approach to review the study that focuses on the relationship between business models and business ecosystems. It tends to discover the existing findings of their relationship which highlights the importance of collaboration, co-opetition, co-evolution, change, value co-creation and co-capture in ecosystem-based business model innovation. Then the literature gaps have been discussed that the relationship between two concepts needs to be analyzed from theoretical perspectives and be supported with a visualized framework to facilitate understanding. Therefore, it leads to the research questions for this research that: 1). What are the definitions and key functions of business models; 2). What are the definitions and key elements of business ecosystems; 3). How to draw the relationships between these two concepts in graphics?

Thus, the following sections explore the grounding theories of business models and business ecosystems. The third section focuses on the business models and reviews
several models from existing literature to identify key functions of business models and allocate into three categorizes: capabilities, value creation and value capture. The fourth section discusses the business ecosystems and explores the key elements that influence the business models. Based on these discussions, a conceptual framework has been constructed to link business model functions to business ecosystem elements. It anchors business model functions as the center from where organizations should decide their value creation and value capture based on their capabilities. Then it needs to identify key ecosystem factors and organizations should consider how can their business models interact with these factors and ultimately reflect they key business ecosystem elements.

1. Systematic Literature Review

Both business model and business ecosystem have popularities in the academic study with many types of research being conducted. However, as the business model innovation highlights the idea of bridging business models and business ecosystems together when considering business model design and re-configuration, the focus of this study will be the relationships between business models and business ecosystems. This research uses a systematic literature review approach to identify the studies that cover both business models and business ecosystems and analyze the results from those studies. It helps to gain an insight of existing academic findings and arguments of relationships between those two concepts whilst also spots the literature gaps for further researches. Therefore, the literature searching will focus on the concepts of business models and business ecosystem and review the literature which emphasizes on the relationship between business models and business ecosystems. Hence, the research criteria will be the literature that contains both business models and business ecosystems as their key research areas.

2.1 Searching Results

The database selected for this study is EBSCO’s Business Source Complete EBSCO, Web of Science and Scopus. The term criteria that is entered for the literature search includes both business model AND business ecosystem as keywords. The timeframe range is last 15 years which are between 2002 and 2017 (data collected in late October 2017) and the source types are limited to academic journals that are written in English. Under these standards, the search results shown the resulted as below (see Table 1).

<table>
<thead>
<tr>
<th>Searching Results for “Business Model” AND “Business Ecosystem”, Academic Journals in English</th>
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<tbody>
<tr>
<td>Business Source Complete (EBSCO)</td>
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<tr>
<td>Web of Science</td>
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<td>Scopus</td>
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As results shown, EBSCO’s Business Source Complete has a larger dataset compared to the other two databases hence the systematic review will be based on EBSCO’s database. To make a comparison with broader studies, based on the same EBSCO database and under the same timeframe and literature type, the result of academic journals only referring to the term business model is 12,711 papers and the result of referring to the business ecosystem is 325 papers (see Table 2). The searching results suggest that: 1). The study of business ecosystems itself is relatively understudied compared to the scale of business models study; 2). The study that contains both concepts is even fewer which implies a research gap to be filled in.

Table 2: Searching results from EBSCO’s Business Source Complete

<table>
<thead>
<tr>
<th>Term Criteria</th>
<th>Business Model AND Business Model</th>
<th>Business Model</th>
<th>Business Ecosystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeframe 2002-2017</td>
<td>111</td>
<td>38,722</td>
<td>609</td>
</tr>
<tr>
<td>Academic Journals in English</td>
<td>74</td>
<td>12,711</td>
<td>325</td>
</tr>
</tbody>
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In regards the timeframe of those 74 papers covering business models and business ecosystems, the number of publications in each year confirms the significance of researching into this area. As it is illustrated in Figure 1, the number of publications soared up in from 2012 and a half of them were published just in last three years (37 out of 74). It reflects the popularity of the research trend to consider both business models and business ecosystems in business management. It also explains that the current small scale of such study is not due to the unimportance or irrelevance of the topic, on the contrary, it is a new and fast developing research field which attracts growing academic interests and calls for more study into this area.

Figure 1: Number of publications in each year (from EBSCO).

However, the sample of 74 papers is only based on the online searching result from EBSCO’s Business Source Complete database, and it can be further narrowed down when
examining the actual contents of these literature. Among those papers, there are some papers do not directly link business models and business ecosystems together (Dalle et al, 2017; Hacklin et al, 2013; Priem et al, 2013); some of the papers only cover or focus on one of the topics (Forkmann et al, 2017; Sztaigret, 2015; Paulose & Nair, 2015; Scheller & Hruby, 2016; Vaz et al, 2013); some of the papers do not have substantial discussions around these concepts but just show up as database searching outcomes (Luo et al, 2013; Munsch, 2009; Peltola et al, 2016). By excluding those, only 41 papers that actually investigate the relationships between business models and business ecosystems, or partly investigate the relationships (e.g. from one or two specific perspectives). It further illustrates the narrow researches in bridging two concepts together.

2.2 Findings from the literature

From those 41 justified papers, there are several conclusions on relationships between business models and business ecosystems can be drawn from their research findings. First of all, these papers prove that there are strong connections between business models and business ecosystems like business ecosystems can potentially influence all components of business models (Muegge & Mezen, 2017; Radziwon et al, 2017). To address their connections, there are several keywords that have been frequently mentioned in the literature which are collaboration, change, co-evolving, value creation and capture.

Collaboration-One of the main arguments in ecosystem study is to regard ecosystem as a collaborated network where organizations connect with each other (Moore, 1996). Therefore, it is essential for organizations to adopt a collaborative business model to connect with other organizations from all different industries (Dinc et al, 2017; Hellstrom et al, 2015; El Sawy et al, 2016). Effective collaboration can help the organization to leverage resources and capabilities from other ecosystem partners and ensure sustainability (Zahra & Nambisan, 2002; Tencati & Zsolnai, 2009).

Coopetition-The other feature of the business model patterns in ecosystem context is the coopetition of organizations’ business models. The word coopetition is the combination of the cooperation and competition as organizations in an ecosystem have to cooperate with each other and tackle the competition as well (Daidj & Jung, 2011). Thus, a business model should be designed to be cooperative as well as competitive to fit in the ecosystem circumstances (Pang et al, 2015; Weiller et al, 2015).

Co-Evolving-There are two levels of co-evolving in business model-business ecosystem analysis. Organizational level is that business models of different organizations in the same ecosystem will co-evolve together (Garnsey & Leong, 2008). Ecosystemic level is that ecosystem will co-evolve with organizations’ business models evolution (Tellier, 2017). Thus, the developments and evolutions of business models and business ecosystems are highly intertwined.
Value Creation and Capture-The value creation and capture are the core concepts of business models (Amit & Zott, 2001; Afuah, 2014). However, due to the strong link between business models and business ecosystems, the value creation and capture should involve ecosystem factors. As business ecosystem is the platform where organizations create and capture value and ecosystem co-evolve business models, organizations should not only focus on their business models but consider the development of ecosystem as well (Radziwon et al, 2017). Moreover, organizations collaborate with others in the ecosystem so the value creation and capture processes are evolved to value co-creation and co-capture with other ecosystem stakeholders (Yrjola et al, 2016; Denicolai et al, 2014; Livari et al, 2016).

Change-As business ecosystem is ever changing, such as technology development or new policy, it is important for organizations to change their business models to echo ecosystem change (Tellier, 2017). Meanwhile, organizations’ roles in the ecosystems can also change which requires new business models to fit in (Livari et al, 2016). Poor or inadequate change of business models will see organizations exit from their ecosystem (Chattopadhyay & Bhawsar, 2017).

Combined with these features, there is a popular concept that has been mentioned in many of those 43 papers which is the ecosystem-based business model. Ecosystem-based business models refer to the business model design that departs from ecosystem perspectives and emphasizes on collaboration, open innovation and value creation for all stakeholders (Livari et al, 2016; Dinc et al, 2017; Yun et al, 2017; Tsvetkova & Gustafsson, 2012). This innovative business model design is based on the understanding of above-mentioned features such as leveraging capabilities from ecosystem through collaboration and building a platform where all participants can co-evolve together (Shuaghnessy, 2016; Yun et al, 2017). This new concept provides the implications for future study that existing literature do not only prove the connections between business models and business ecosystems, they suggest an innovative thinking which to consider business ecosystem factors as early as at the design and configuration stages of business models.

2.3 Discussions

From the searching results from databases, it can be seen that there is only a little research that covers both business models and business ecosystems. EBSCO’s Business Source Complete shows the largest numbers of literature under searching criteria but there still only 41 papers of them actually mention the relationships between two concepts. Therefore, the first literature gap is the lack of research on the interdependencies between business models and business ecosystems, even increasing publications reflecting the growing popularity of this study area.

Secondly, although existing literature have illustrated some findings of the relationships between two concepts, the connections they have built are empirical-grounded rather than theoretical-grounded. Those 41 papers investigate a variety of
industries such as electric vehicles (Weiller, 2015), airlines (Dinc et al, 2007), health and biomedical (Li & Garnsey, 2014; Pang et al, 2015), IT (Wnuk et al, 2004; Ghezzi et al, 2013; Teece & Linden, 2017) and media (Yrjola et al, 2016; Daidj & Jung, 2011). They draw the relationships between business models and ecosystems based on the patterns and findings from those specific industries. However, such connections are empirically-based and there can be a research that analyses from the opposite angle which departs from theoretical perspectives. There should be a study that investigates the theories of business models and business ecosystems and build relationships based on their theoretical elements which are more generalized for the application.

The other literature gap is the graphical presentation of the relationships. Among 41 selected papers, only 18 of them include graphics that indicate the connections between business models and business ecosystems and few of those graphics demonstrate a comprehensive and solid framework of their relationships. The lack of graphics and frameworks hinders the understanding as they could provide a more direct and clear view of the connections between two concepts. Thus, this study will evaluate and framework their connections from theoretical perspectives and visualize their relationships by presented in graphics.

Therefore, after summarizing above three literature gaps, there are three research questions (RQs) for this paper aiming to build a theoretical linkage between business models and business ecosystems. RQ1: what are the key functions of business models? RQ2: what are the key elements of business ecosystems? RQ3: how to draw the relationships between these two concepts in graphics?

2. Business Models Key Functions

The business model study has emerged from the 1990s and many researchers have attempted to define this concept (Markides, 2013; Wirtz et al, 2016). However, there is no version of definition that has been widely accepted and agreed on the definition of the business model (Zott et al, 2011). Despite this, the interpretations of business models from different researchers have similarities and a business model can be defined by two parts. Firstly, a business model is regarded as a design (Serrat, 2002), recipe (Afuah, 2014), a system (Markides, 2013), a structure (Amit & Zott, 2001) or a framework (Chesbrough & Rosenbloom, 2002) of an organization. It is a general setting that influences the whole processes and activities of an organization. Secondly, the core of a business model is about value creation and value capture (Casadesus-Masanell & Ricart, 2010; Serrat, 2012; Teece, 2010; Foss & Saebi, 2017; Wirtz et al, 2016). Therefore, a business model can be defined as a general configuration or framework of an organization which creates and captures value for that organization.

After reviewing the definition of the business models, the next step is to identify the key functions of a business model by evaluating some of the existing studies. The selected studies include Afuah (2014), Osterwalder and Pigneur (2010), Chesbrough and Rosenbloom (2002), Gassmann et al (2012) and Johnson et al (2008). After
comparing and analysing their models or summaries of business model functions, there are overlaps between their works which highlight several key functions of a business model.

Afuah (2014)

Afuah's (2014) business model consists of five components which are customer value proposition, market segments, revenue model, growth model and capabilities (see figure 2). These components are explained as below:

Figure 2: Afuah's components of a business model (2014)

- **Customer Value Proposition**: Value proposition decides what services or products can an organization provide to customers and can it satisfy customers’ needs. However, in Afuah (2014)’s explanation, customer value proposition is more than product or service but also related to other assets such as distribution channels.

- **Market Segment**: This component is all about customers such as the number of customers, their demographics, customer willingness to pay and attractiveness. It is suggested organization could discover customers’ needs with customers as they may not know what they really need.

- **Revenue Model**: It determines how many customers will pay for the offering at what price as well as when and how to pay.

- **Growth Model**: The main target of this component is (long-term) profitability and to achieve it organization needs to maintain high revenues and refine cost structures through strategic options such as blocking competitors and finding co-operators.

- **Capabilities**: This is central of a business model as it drives and determines the value creation and value capture outcomes. Organization’s core capabilities consist of two parts, activities and resources. For resources, it includes brands, people, equipment, financing, culture, knowledge, ecosystem relationships and network positions. For activities, it represents who, when, where and how a business model performing throughout its value chain.

One of key contribution from Afuah’s (20014) model is the capabilities component
which is described as the central of business model. It implies that some elements of a business model may not directly engage in value creation or value capture processes but they drive or support value creation and capture outcomes.

Osterwalder and Pigneur (2010)

The business canvas, or nine building blocks, is the work of Osterwalder and Pigneur (2010) who categorize business model into nine elements (see figure 3) which are:

- **Customer Segments**: the market and group of customers that the organization targets.
- **Value Proposition**: what value that products or services create to the target segment.
- **Channels**: how to deliver the value to target customer segment efficiently.
- **Customer Relationships**: what type of relationships to be established with customers.
- **Revenue Streams**: revenue generation from customer segment.
- **Key Resources**: assets required to support other business model blocks.
- **Key Activities**: activities required to support other business model blocks (value proposition, customer relationship, revenue generation).
- **Key Partnerships**: the network with suppliers and partners.
- **Cost Structure**: break down all costs occurring in the business model.

Osterwalder and Pigneur’s (2010) business model canvas list the key business model elements in detail and the canvas can also be divided into two parts in terms of internal and external elements. The four blocks in the left (key partnership, key resources, key activities, cost structures) are the back-end of a business model whilst right five blocks (value proposition, customer relationships, channels, customer segment, revenue streams) are front-end of the business model that faces and engages with customers.

Gassmann et al (2014)
This model comes from the book ‘The Business Model Navigator’ and covers four elements of a business model (Gassmann et al, 2014). These elements are displayed as four questions that should be answered in business model innovation (see figure 4). Figure 4: Business model innovation from Gassmann et al (2014).

- **Customer**: who is the target customer segment?
- **Value Proposition**: what do organization offer to customers?
- **Value Chain**: how do organization produce offerings (and what activities/processes)?
- **Profit Mechanism**: how does it generate profit? Including cost and revenue structures.

Gassmann et al (2014)’s model is relatively simple as it only contains four elements and three of them focus on value creation. They integrate organization processes and activities into the value chain which is similar to Chesbrough and Rosenbloom’s (2002) model. However, those processes and activities are only value chain associated or value creation associated and there are other key activities, resources, processes that this model fails to cover.

**Chesbrough and Rosenbloom (2002)**

Chesbrough and Rosenbloom (2002) categorized business model into six functions which are value proposition, market segment, value chain, cost structure, value network and competitive strategy.

- **Value Proposition**: the value created for customers to use.
- **Market Segment**: group of customers who received the value created by organization.
- **Value Chain**: provide assets and supports to create and deliver value.
- **Cost Structure**: estimate cost structure and profit potential of the business model.
- **Value Network**: organization’s position in the network (with suppliers, partners etc.)
- **Competitive Strategy**: strategy that to maintain a competitive advantage over rivals.

Chesbrough and Rosenbloom (2002)’s model mentions the importance of organization’s networking and strategy in the business model. However, although they
include value chain that contains organization activities (Porter, 1985), their business model does not highlight internal or backstage elements such as resources and activities as independent key elements.


This is the model generated by Johnson et al (2008) in which they divide the business model into four key functions which are customer value proposition, profit formula, key resources and key processes (see figure 5).

Figure 5: The elements of a successful business model (Johnson et al, 2008)

- **Customer Value Proposition**: including value creating, offering and market segment.

- **Profit Mechanism**: take considerations of profit, cost, margin and resource velocity.

- **Key Resources**: assets such as people, technology, equipment, information, channels, partnership and brand that involved in value creation.

- **Key Processes**: operational and managerial processes that deliver the value. It also includes organization’s rules and norms.

In this model, Johnson et al (2009) integrated many elements into only four main functions. For example, they include market segment into customer value proposition section whilst other studies tend to separate these two (Afua, 2014; Osterwalder & Pigneur, 2010; Gassmann et al, 2014; Chesbrough & Rosenbloom, 2002). The most confusing elements are their key resources and key processes. In their interpretation, key resources related to value creation while key processes deliver the value. However, many of elements are not directly take part in value creation and delivery processes such as people, information, brand, partnership, organization rules and norms. Their categorization of resources and processes are more like the combination of value chain activities and general resources and processes. Despite the vague categorization, this
model contributes to the study as it introduces rules and norms as part of business model key elements.

Above theoretical studies have introduced and categorized key business model functions in different ways. It is hard to decide which study best describes the business model functions. However, as many functions from these studies are overlapped or have similar interpretations, these theoretical models can be cross-tabulated for comparison and analysis (see Table 2).

The way to construct the table is based on the definition of the business model which is summarized as a general configuration of an organization which focuses on value creation and value capture (Teece, 2010; Foss & Sæbø, 2017; Serrat, 2012). There are three main aspects of the business model definition which are configuration, value creation and value capture. To compare with the key functions identified from above selected studies, it can be seen that these key functions can be categorized into the exact three aspects from business model definition (see Table 3). Thus, we allocate the functions from mentioned studies into three sections which are: value creation, value capture and configurations (capabilities).

For value creation, the key value creation functions of a business model can be summarized as value proposition, market segment and value chain. All five studies have highlighted the value proposition as key business model function (Afuah, 2014; Osterwalder & Pigneur, 2010; Gassmann et al, 2014; Chesbrough & Rosenbloom, 2002; Johnson et al, 2008). Market segment or customer segment has been mentioned by all five studies as well, despite that Johnson et al (2008) include it as part of value proposition process. Value proposition and market segment explain what value to create and to whom the value is created for respectively. The next value creation function is how to create the value and the answers from literature is value chain (Gassmann et al, 2014; Chesbrough & Rosenbloom, 2002). Afua (2014) and Osterwalder and Pigneur (2010) introduced channel but the concept of value chain provides a wider view of the value creation process. Thus, the overlapped key value creation functions of a business model from those research models are value proposition, market segment and value chain.

For value capture, there are three words that are captured in the literature that are revenue, cost and profit. It is an essential aim for an organization to capture adequate profits which enable the organization to survive and develop (Yip, 2004). Hence, Gassmann et al (2014) and Johnson et al (2008) introduced profit mechanism in their models. However, to break down the profit mechanism, it consists of two parts which are revenue generation and cost structure as explained by Afuah (2014), Osterwalder and Pigneur (2010) as well as Chesbrough and Rosenbloom (2002). Therefore, as profitability is the main criteria for business model’s value capture, the main functions of a business model can be broken down into revenue generation and cost structure.
<table>
<thead>
<tr>
<th>Table 3: Summary of business model elements from existing studies</th>
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<tr>
<td>--------------------</td>
</tr>
</tbody>
</table>
| Value Proposition  | -Value Proposition *(product/service, Channels)* | -Value Proposition | -Value Proposition | -Value Proposition | -Value Proposition *
| (product/service, | -Customer Relationship | -Target Customer | -Market Segment | *(target customers, offering)* |
| Channels)*        | -Channel       | -Value Chain *(processes, activities)* | -Value Chain | | |
| Market Segment     | -Customer Segment |                          |                      |                           |                      |
| **Value Capture**  | -Revenue Model *(profitability, cost)* | -Revenue Streams | -Profit Mechanism | -Cost Structure | -Profit Formula *
| (profitability, cost) | -Cost Structures |                          |                      |                           | *(revenue model, cost structure, margin model etc.)* |
| **Capabilities/Configurations** | -Capabilities *(resources, activities)* | -Key Partnerships | -Value Network | -Key Processes *
| *(resources, activities)* | -Key Resources  | -Competitive Strategy | *(development, rules, norms)* |
|                     | -Key Activities |                          |                       |                           | *(people, technology, channel, partnership, brand etc.)* |
Besides of value creation and value capture functions, there are other business model functions from the literature that are either not purely associated with value creation nor purely associated value capture but they have general influences over the organization. These functions can be regarded as the general configurations of the business model as what the definition suggests or it can be regarded as core capabilities of the organization (Afuah, 2014). Key resources are introduced by Afuah (2014), Osterwalder and Pigneur (2010) and Johnson et al (2008) as important internal support to the organization. For example, human resources, organization’s business model requires having employees to create value (R&D staff, salesman etc.) as well as to have employees responsible for value capture (accountants, financial analysts etc.). In addition, organization’s network is important that how business model connects with other partners determine how well the organization can create and capture value (Chesbrough & Rosenbloom, 2002; Osterwalder & Pigneur, 2010). Moreover, Johnson et al (2008) suggest the key processes from business models such as rules and norms of organization which guides how organization operates under their standards. Therefore, the other part of the business model is capabilities or configurations which provides general settings or support to the organization’s value creation and value capture through key functions like resources, networking, and processes.

Figure 6: Key functions of business models.

To summarize, we introduced five research models from the existing literature which explain the key functions of business models and then categorize those functions into three aspects which are based on the definition of the business model. Hence, a business model has several key functions in value creation, value capture and core capabilities. Value creation functions include value proposition, market segment, and value chain. Value capture functions contain revenue generation and cost structure. Capabilities or configuration functions consist of resources, processes, and network of the organization. For better illustration, these functions have been drawn in a graph shown as above (see figure 6). The business model’s core capabilities or configurations are located in the central of the graphic as these functions support the whole organization’s procedures. Surrounding aspects are value creation and value capture.
which are the main business model activities and the key functions that facilitate the value creation and value capture outlined in the graph.

3. **Business Ecosystems Key Elements and Relationships with Business Models**

The concept of the business ecosystem was put up by James F. Moore in 1990s as he claimed that business environment has changed and organizations participate in an environment similar to a biological ecosystem (Moore, 1993). He described that organizations from different industries participate in the same business ecosystem where they cooperate and compete together (Moore, 1996). As an analogy study of the biological ecosystem, a business ecosystem also has its own vitality that it can be self-sustaining and self-renewal (Peltoniemi & Vuori, 2004). Organizations, like creatures in nature, behave in the ecosystem as well as determine the ecosystem’s vitality as organizations can be born, grow, expand and die in the ecosystem (Moore, 1996; Iansiti & Leiven, 2004; Williamson & Meyer, 2012). The core of the business ecosystem is connectivity between participants that organizations should collaborate with each other as a network that jointly creates and captures value (Kandiah & Gossain, 1998; Kapoor & Lee, 2013; Ander & Kapoor, 2010). Eventually, when organizations are developing and evolving, as they are all connected and share the same ecosystem, all organizations and the ecosystem will co-evolve together ((Tellier, 2017; Gawer & Cusumano, 2014; Williamson & Meyer, 2012). To conclude, an ecosystem can be defined as a cross-industry, self-renewal network where organizations connect with other parties with cooperation and competition and co-evo
e
together.

The definition of business ecosystem reflects the findings from the literature. In systematic review part, it summarized the key elements of business models-business ecosystem relationship include **collaboration, coopetition, co-evolving, value creation and capture, change**. These elements have all been mentioned in business ecosystem definition as they are the core ideas of a business ecosystem. Therefore, the attempt to link business models with business ecosystems is the effort that builds business models knowledge upon the understanding of the business ecosystem to seek how business models should be designed and operated under ecosystem circumstances.

It implies that business models design and innovation should follow and reflect the business ecosystem rules such as emphasizing on collaboration and regarding co-evolution as a target. Without considering business ecosystem or solid understanding of the ecosystem, the business models design and innovation might neglect those ecosystem circumstances and features. It will be like a blind operation for an organization if their business models could not well fit in their ecosystem (Ander & Kapoor, 2010; Funk, 2014; Iansiti & Levien, 2004). That is why as the business ecosystem concept becoming mature and popular, latest study address the significance of ecosystem-based business model because such model gives organizations the vision of their business ecosystem at the starting point and ensure
their business model innovation conforms their ecosystem context (Livari et al, 2016; Dinc et al, 2017; Yun et al, 2017).

Figure 7: Business ecosystem model from James F. Moore (1996)

As it is important to have a business ecosystem vision when configuring business models and currently few studies had made attempt to frame their connections, it tends to draw a framework that can reflect identified key elements and relationships. Moore (1996) had created a model that shows business ecosystem as external environment of the core business and allocate the business ecosystem as the outer circle of enterprise’s business (see figure 7) which provides the guidance for this study to build own theoretical framework. In Moore’s model, he did not apply the concept of business models but use core business and extended enterprise as the central. Hence, to further modify it, the center of the framework should be the business model key functions model that generated above (see figure 6) and place the ecosystem circle around which gives the Figure 8 below.

Figure 8: Conceptual framework without ecosystem factors
The business ecosystem is the surrounding environment of a business model that an ecosystem-based business model’s key functions should be designed and performed aligning to that ecosystem. As identified in previous contents, there are several key elements include collaboration, co-evolution, coopetition, value co-creation and co-capture. It is essential for organizations to be aware of these ecosystem features and innovate their business models with emphasis on these features. On the one hand, a business model should be designed with strong collaboration with others and pursue value co-creation and co-capture. It should be cooperative with beneficial partners as well as being able to build competitive advantages against others. On the other hand, if a business model is designed to perfectly match its business ecosystem or even shape the ecosystem like Google and Apple (Yun et al., 2017), it should reflect the basic theories of an ecosystem that its participants’ business models would collaborate together to cooperate, compete, create and capture value and eventually they will co-evolve with the whole ecosystem. Thus, we list these principle elements around the ecosystem circle in this framework.

The further step is to modify the framework is to decide what ecosystem factors should be considered. Like in Moore’s model (1996), for business ecosystem, he listed several factors such as trade associations, investors, government, labour unions and stakeholders. He regarded these factors as having big influences on organizations’ core business activities and should be emphasized by organizations. However, different types of ecosystems should have different factors (Scaringella & Radziwon, 2017). Thus, the exact ecosystem factors should be identified in the specific context or industry.

Figure 9: Babson Entrepreneurship Ecosystems from Isenberg (2010)
Here the Babson entrepreneurship ecosystem from Isenberg (2010) is illustrated as an example in order to complete the conceptual framework. Isenberg (2010) summarized up six factors which are policy, finance, culture, supports, human capital and markets and he claimed most of the entrepreneurship will be highly influenced by these six factors. Each of these factors has break-down elements which can be seen from the Figure 9. Under his suggestion, for entrepreneur organizations, they need to consider these factors when running their businesses which mean their business models should take these factors as primary focuses. Thus, if use entrepreneurship business as an example and apply Isenberg’s ecosystem factors, the conceptual framework will be like below:

Figure 10: Conceptual framework with ecosystem factors

To explain this conceptual framework of relationships between business models and business ecosystems, it shall be viewed from central to outer. In the center is the organization’s business model. Organization’s capabilities or general configurations are the start point which determines what resources do they have, who are they connected with and what strategies and rules do they apply. Based on these, an organization can design their business model and find ways for value creation and value capture. To create value, they need to decide their value proposition, market segment and form a solid value chain. To capture value, the business model should have effective revenue generation and cost control to maximize profits. All together will complete the core functions of the business model and such procedure is based on the theoretical definitions of the business models and key functions identified from existing literature.

Then for the outer circle which is business ecosystem part, it contains the key ecosystem factors. In this case, it makes example of entrepreneur business and adopts the entrepreneurship ecosystem factors generated by Isenberg (2010). Thus,
entrepreneur organizations need to focus on policy, culture, finance, markets, supports and human capital factors when innovating their business models. In the case of other ecosystems such as knowledge ecosystem, technology ecosystem or sports ecosystem, the key factors will be different and it should be explored under those certain contexts. After identifying the key ecosystem factors, the business model should be designed to echo the ecosystem features including collaboration, value co-creation and co-capture, coopetition and co-evolving, which are the definitions of the business ecosystem and proved in empirical studies. Organizations should ask themselves questions when innovating their business models such as: who should we collaborate with? What value should we co-create and co-capture? How can we cooperate and compete with each other? Will our model co-evolve with ecosystem together or will we re-shape the ecosystem?

Overall, this conceptual framework tends to explain and visualize the relationships between business models and business ecosystems. The functions of business models and elements of business ecosystems come from the definitions of these two concepts and further evaluated by academic research. Therefore, this framework is founded on the theories of business models and business ecosystems which makes the framework more grounded compared to the existing models or conclusions generated from the empirical study. The relationships between two concepts are presented in a graph which can offer a more visualized view of their connections and facilitate understanding. This is a framework that can be generally applied to different sectors just to be aware of that the exact ecosystem factors should be identified under specific contexts and explored empirically.

4. Conclusion

This paper takes a systematic literature review approach to theorize the relationship between business models and business ecosystems. From the searching results of databases, it suggests that there is only a small number of studies containing both business models and business ecosystems but this research field is growing fast. By review the literature, it identified research gaps that there is a need to link these two concepts from conceptual perspectives and visualized the connections in a framework. Therefore, this research investigates the general theories of business models and business ecosystems. It constructs the business model functions by analysing some key models from the existing studies and categorizes business model functions to capabilities, value creation, and value capture. Then it involves business model key elements as the external context which requires the business model to focus on elements like collaboration, coopetition, co-evolution, value co-creation and co-capture. To innovate a business model that can reflect these elements, the organization needs to identify key ecosystem factors which are unique to each ecosystem. Such relationship then is presented in a conceptual framework (see Figure 10) which places the business model functions in the center, key ecosystem factors
around and the outer circle shows the key ecosystem elements that a business model should target for.

As this conceptual framework is based on the grounding theories of business models and business ecosystems, it has a generality that can be applied to different sectors in future business model-business ecosystem study. It also provides the guidance for business model innovation as it states what factors and what procedures should organizations follow when innovate or re-configure their business models.

However, to further validate this framework, the empirical study based on this framework is required. The argument of this framework is that the ecosystem factors should be identified specifically in each ecosystem. Therefore, the future study of this will select Chinese football ecosystem as an example to investigate how does this conceptual framework can be applied in this ecosystem. It will explore the key ecosystem factors in the Chinese football ecosystem and investigate how football organizations in China design and innovate their business models and have their business model innovation fit in their ecosystem. Such empirical study will test the validity of the conceptual framework in this paper for its generality and effectiveness in presenting the relationship between business models and business ecosystems.

There are several limitations of this research as well. As stated that empirical study needed in order to test this conceptual framework. The systematic literature search criteria also can be improved. The searching criteria limits to the business model and business ecosystem. However, many research especially early research does not refer to term ecosystem but use synonymous terms such as business environment and platform. The searching criteria in this paper may miss out literature using those synonymous terms which gives an incomplete literature sample.

**Acknowledgement**

This is an on-going work of part of my PhD research at Loughborough University London, Institute for Sport Business. I would like to thank my supervisors, James Skinner and Anna Grosman whose guidance and feedbacks help me to generate this paper. I would also like to thank Mikko Koria who provided valuable advice for this PhD research.
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