Service in the Platform Context: A Review of the State of the Art and Future Research

Xia Han, Veronica Martinez, and Andy Neely

Abstract Traditional ways of doing business have been turned upside down by a group of new companies. Uber is "the world's largest taxi-company owns no vehicles". Facebook is "the world's most popular media owner creates no content", and Airbnb is "the world's largest accommodation provider owns no real estate". This relatively new research phenomenon requires a comprehensive understanding. This systematic literature review explores and questions "platform" research in the context of services.

This article studies 133 articles between 2002 and 2016. The findings suggest that the service platform is an increasingly popular field of research with a wide spectrum of disciplines across 74 journals. It is gaining momentum moving from theoretical to an empirical research area. Ninety-one articles included empirical data.

The definition of a service platform has been categorized in three major groups. They are the architectural researches (n = 37), the economic group (n = 21), a comprehensive definition (n = 48) and generic (n = 27), which is a group of papers that did not explicitly discuss the core features of platforms. This literature review develops a taxonomy of research topics based on their research focus: (1) service architecture, (2) platform's impact on services and (3) service platform strategy. Finally, three key challenges are identified, which also serve as opportunities for future research.

Keywords Service platform · Multi-sided platform · Literature review

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Introduction

New technologies have enabled the proliferation of platform-based business models across industries, drastically changing the landscape of today's economy. Uber, Facebook and Airbnb can all be categorized as "multi-sided platforms" (hereafter referred to as "platforms"). These platforms serve the function of matching the needs and resources of two or more groups of customer (Evans and Schmalensee 2016; Parker, Van Alstyne and Choudary 2016). One of the most distinctive features of these platforms is the positive correlation between the number of participants and the value of the network (Hagiu and Wright 2015; Gawer 2009).

Despite the extraordinary impact of "platforms" in our service economy, the existing literature is mainly focused on product-based platforms (Thomas et al. 2014). Service accounts for over 50% of the GDP of the developed world's economy (World Bank 2014). Researchers are beginning to explore the "service" aspect of platforms (Suarez and Cusumano 2010; Gawer 2011); therefore, the service platform agenda is an open subject for future research. The objective of this chapter is to investigate the state of the art in terms of "service platforms". The systematic literature review was selected because of its strong objectivity and transparent approach to searching for and synthesizing research (Tranfield et al. 2003).

This chapter is structured as follows: first, the methodology used to select the relevant papers is briefly introduced. Then, the research findings, trends and future directions are discussed. Finally, the limitations and conclusions are presented.

Methods

This explorative review follows a six-stage process proposed by Tranfield et al. (2003): scope and identification of key words, evaluation of search results, refinement of search criteria, title and abstract review, selection of articles for full review and synthesis.

Scoping

Use of the term "platform" is very broad, varying from a concrete digital marketplace to a saloon facilitating discussions. This study takes a slightly narrower view. "Platform" in this study requires the article to contain explicit mentions or implications of network effects. For instance, in the information systems and information technology literature, the term "platform" has been loosely used as equivalent to "system" or "software". For instance, Tyagi and Senthil (2015) discuss the process of moving library automation software to a cloud-based platform. In this case, platform is dismissed, since the core service activity, library automation, does not

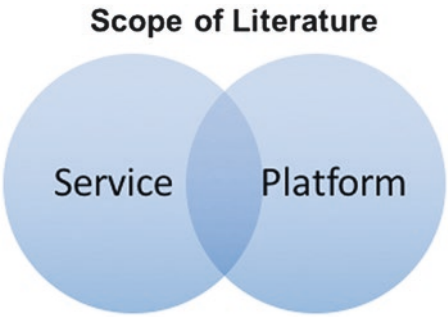

Fig. 1 Scope of the literature

Table 1 Initial search result

Key word/databases	Science Direct	Web of Science	Google Scholar
Platform	58,015	313,702	3,960,000
Service	197,126	875,007	5,960,000

benefit from network effects; nor does the paper extensively discuss technical implications such as modularity.

Comprehensive Search

First, the key words in the study were identified. In order to capture the widest range of literature while remaining relevant and focused, two of the most representative key words were chosen, namely, "service" and "platform" (Fig. 1). Only singular forms of the key words were chosen because their plural forms are automatically searched for by the databases.

Three databases were selected to test the search terms, with each database representing a segment of database size. The basic search strings representing the entire knowledge base were tested across the three databases. Science Direct returned the lowest number of results, and Google Scholar generated the highest number of matches. Table 1 shows the initial search results.

All three databases generated a significant amount of literature. However, the majority of the findings were not in management-related fields and were irrelevant to this systematic literature review. Therefore, a set of exclusion criteria was set up to filter the research results. Through this process, the comprehensiveness of the databases in the relevant fields was further tested.

The following criteria were applied at the refinement stage:

1. Only English articles were chosen for the first two databases, where such options were available.
2. Only peer-reviewed articles were selected, given the available functionality of the chosen databases.

3. The search period ranged from 2002 to 2016. The rationale behind the start date was based on the pioneering work of two-sided platforms by Jean Rochet and Nobel Prize winner in Economics, Jean Tirole, in 2002 and 2003. In terms of management scholars, Anabelle Gawer and Michael Cusumano also published their seminal book Platform Leadership How Intel, Microsoft, and Cisco Drive Industry Innovation in 2002.
4. Only business-related subject areas were chosen (e.g. business economics, operations research, management science or information science), thus preventing the search results from convoluting, since both platform and service have a wide range of usage.

As a result of the limited functionalities and large variability of data from Google Scholar, it was excluded from the search. The following table shows the refined search results. The "filtered" line indicates the number of findings in each database after applying the inclusion and exclusion criteria (see Table 2).

Title and Abstract Screening

The abstract reviewing process further eliminated articles that were irrelevant to this literature review by focusing on two criteria. First, did the paper have a setting in the service-related context? Second, was the paper concerned with the two characteristics of the platform? After carefully reading the 1088 abstracts, 162 articles were selected for full paper review. Some of the abstracts required screening to clarify the subject area. The purpose was to clarify the ambiguous terms used in the abstracts. Finally, the remaining 133 papers formed the basis of this review. Figure 2 shows the selection process of key articles for this study.

Table 2 Core area "Service + Platform" search result

Criteria/databases	Science Direct	Web of Science
Not applied	3,499	2,736
Applied	331	1,088

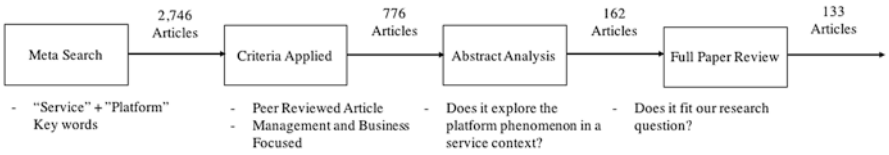

Fig. 2 Screening process

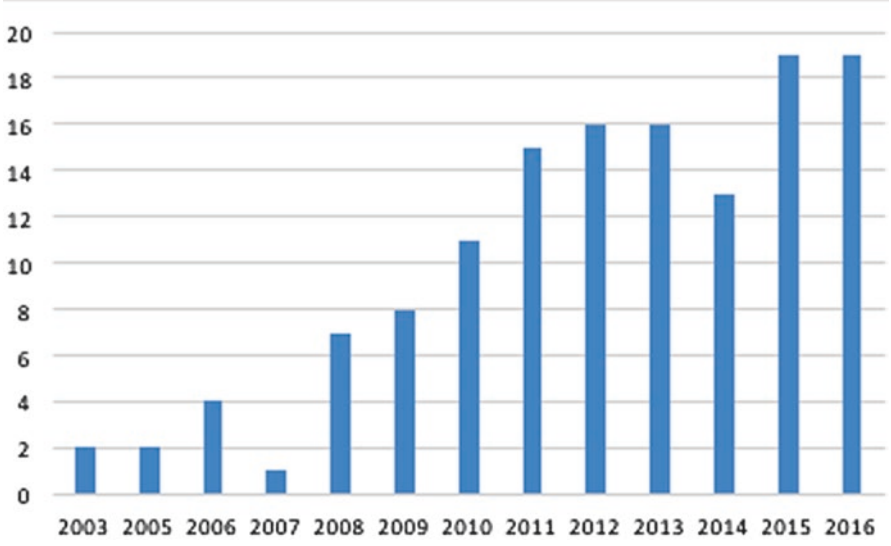

Fig. 3 Distribution of papers published annually

Descriptive Data

The 133 selected articles from the systematic literature review are analysed and presented in this section. The discussions and findings of this study are presented in the following section.

Research Distribution

In the early 2000s, the "platform" literature gained momentum, but it was not until 2008 that it gained significant attention (see Fig. 2). On closer inspection, two of the most cited papers in 2008 are "How companies become platform leaders", published in the MIT *Sloan Management Review,* and "How to sell service more profitably", which was published in the *Harvard Business Review*. Bridging the two phenomena may have become more relevant since then (Fig. 3).

The "service platform" topic attracts a wide array of interests from across disciplines. The literature is dispersed over 74 journals, with most of the publications being in the field of technology and information science. This was expected given that the root of the platform theory was inspired by earlier engineering and operation management concepts such as "modularity". Recently, however, management journals such as *Management Science* have started to publish on this topic. Table 3 shows the most popular journals that have published articles.

Table 3 Journals with more than two publications

Journal	No.	Journal	No.
Information & Management	5	*Telematics and Informatics*	3
Service Industries Journal	4	*Service Business*	2
Harvard Business Review	4	*MIS Quarterly*	2
Journal of Information Technology	4	*Journal of Electronic Commerce Research*	2
Telecommunications Policy	4	*Information Economics and Policy*	2
Information Systems Research	3	*Management Science*	2
Journal of Service Management	3	*Information Systems Journal*	2
Technovation	3	*Journal of Business Research*	2
Industrial Marketing Management	3	*MIT Sloan Management Review*	2
Information Systems and e-Business Management	3	*Marketing Science*	2

Table 4 Methodologies applied by the empirical studies

Methodology	No. of articles	Methodology	No. of articles
Case studies (multiple cases)	30	Survey	32
Case study (single case)	11	Secondary data analysis	13
Experiment	5		
Total			91

Given the infancy stage of "service platform" research, a considerable proportion of the work is conceptual. Approximately 68% (91 papers) of the research is made up of empirical studies with explicit data-gathering methodologies. A considerable portion of the research still comprises conceptual papers (Table 4).

The industries studied are consistent with the journal publications. In total, 55 studies were predominantly conducted within the IT or Internet-related industries, and most cases are set within the context of the social network (15 articles). The subjects include social media advertising, content services and e-word of mouth. E-business (11 articles) research on B2C and C2C commercial services follows closely after. The Internet is considered to be one of the key enablers of platform-based business (Table 5).

The topics on the service platform are also diverse. Appendix I shows a sample of the current research papers and a list of excerpts of some of the systematic literature review findings.

Findings and Trends

This section covers the findings from the literature in three areas. First, the theoretical foundation of the service platform is discussed, followed by the current research trends of the core literature. Finally, a few challenges, which are also potential research directions, are discussed.

Table 5 Top industries researched and subareas of IT industry

Industries researched	No. of articles
IT Internet	55
Telecom	14
Not specific	11
Service industry	10
Manufacturing	3
Retail	2
Subareas within IT industry	No. of articles
Social network	15
E-business	11
Crowdfunding	3
P2P services	3
Service-oriented architecture	3
Internet of things	2

Definition

Even though the service platform is a popular topic, as shown in this literature review, the definition of a service platform, or even "platform", is still being debated. This review has identified four main types of definition of platform: generic, architectural, economic and comprehensive, as shown in Fig. 4.

A significant portion of the papers included in this review have interpreted the term "platform" loosely. Some research uses the generic meaning of platform, indicating any online system as a "platform" (e.g. Cao et al. 2013). These papers do not discuss the modular architectural or economic features of the platforms. The focus of the papers typically evolves around aspects of services in the platform context. For instance, the studies of e-commerce platforms (e.g. Lehdonvirta 2009; Blasco-Arcas et al. 2014) go in depth to discuss user behaviours in the virtual marketplace. They emphasize cognitive drivers such as trust and service experience rather than network effects. However, these papers provide valuable insights for service platform researchers, as they offer alternative constructs to determine the performance of the service platform.

The platform-centric research accentuates two characteristics of service platforms. The first stream of literature is identified by the review as the "architectural aspect" of the platform research. In this context, a platform is defined as the common basis for product and service development (e.g. Gawer and Cusumano 2008). Gawer and Cusumano (2002) introduced the case of Intel's x86 chipset as a platform. External partners would join Intel's platform with their respective products, such as the video card by Nvidia, the hard drive by Western Data and the motherboard by ASUS, to provide the PC solution for the end customers. The profit from

PC customers is shared among these partners. This concept is derived from the modularity literature (Woodard and Baldwin, in Gawer 2009). Similar applications are also found in the service modularity literature (Pekkarinen and Ulkuniemi 2008).

The second stream of platform-centric literature is identified as the "economic aspect" of service platform research, which is mostly concerned with the network effect of platforms (e.g. Eisenmann et al. 2006). In other words, the more people engage in a platform, the more benefits are received by participants. Katz and Shapiro (1985) introduced the concept of network effect in their "network economics" work. The case of the telephone illustrates the value of the network. A single telephone does not generate any value for its user, since there is no one to call. However, the value of the telephone increases exponentially for every new phone introduced to the network.

Finally, a body of literature acknowledges both the architectural and economic aspects of the platform. Several authors have proposed that the theoretical foundation of the service platform requires more consolidation from the two aspects (e.g. Gawer 2014; Baldwin and Woodard 2009; Evans and Schmalensee 2007). This view has been adopted by an increasing number of authors, as shown in Fig. 4.

In terms of overall distribution, the architectural aspect is predominant. This is partially due to the literature on information technologies, where the emphasis of the research is on platform construction. However, there are a consistent number of publications that acknowledge a unified understanding of platforms (see Fig. 3). It is expected that more research will adopt a similar definition in the future, given the continued popularity of the research topic.

Specific definitions of the service platform are also emerging. In the area of service research, the service dominant logic (SDL) proposed by Vargo and Lusch (2008) has been widely cited. The current literature on service platforms has not extensively applied SDL in the context of the platform. Nevertheless, Lusch and Nambisan (2015) proposed the comprehensive application of SDL in the service platform context. The research landscape may be influenced in the future.

Discussion of Theoretical Foundation

Based on the platform-centric definitions, their theoretical foundation and directions for later research are discussed in this section. The architectural perspective of service platform research is partially inspired by the modularity research. In a modular system, each module fulfils a function and communicates with the others through standardized interfaces (Ulrich 1995). Contrary to the "integral" design, the components and functions have clear one-to-one relationship. Therefore, each part remains relatively independent from the other components. The "loose coupling" concept implies that the improved clarity and transparency of subsystems leads to many advantageous adjustments to complex systems (Campagnolo and Camuffo 2010).

Year Published	Generic	Architectural	Economic	Comprehensive	Total
2003		1	1		2
2005			2		2
2006	1	1		2	4
2007				1	1
2008		3	1	3	7
2009	1	1	2	4	8
2010	1	3		7	11
2011	3	8	2	2	15
2012	4	3	5	4	16
2013	3	4	1	8	16
2014	2	4	1	6	13
2015	5	5	4	5	19
2016	7	4	2	6	19
Grand Total	**27**	**37**	**21**	**48**	**133**

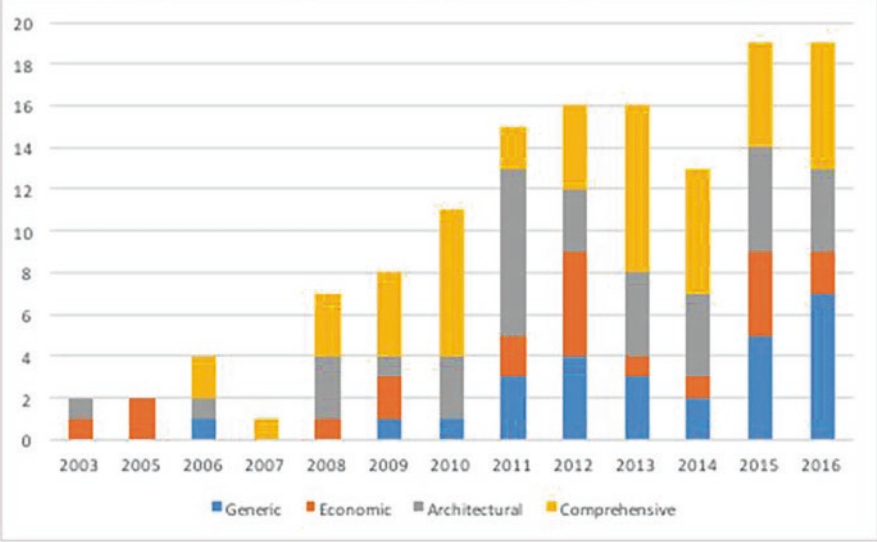

Fig. 4 Platform theoretical basis distribution annually

The most relevant architectural features can be summarized in the following three categories. First, due to the relative independence between each module, the engineers working on each module would enjoy a higher degree of freedom to allocate resources for new developments (Lau et al. 2010). Second, by sharing a common core platform, where the interface with the customers remain the same, the back-office operations can be modularized (Tuunanen and Cassab 2011). Therefore, aligning the strategic objective with existing resources would determine the most appropriate modules. Finally, by recombining the service modules, a higher degree

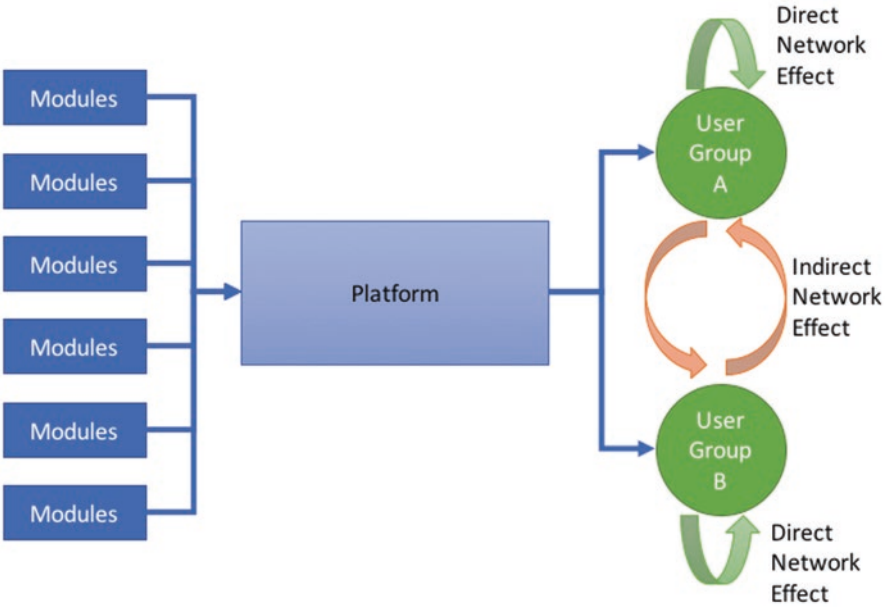

Fig. 5 Illustration of service platform features

of flexibility of service offerings can be achieved, which makes mass customization possible (Bask et al. 2010).

Network externalities or network effects can be referred as demand-side economy of scale. It is in contrast of the supply-side economy of scale, where the unit production cost reduces while the number of units produced increases. In the case of demand-side economy scale, the value of the product or service is contingent to the number of users (Shapiro and Varian 1998). Network effect is often deemed as the key contributing factor to a platform's success. Specifically two types of network effects exist in multi-sided platform. The right side of Fig. 5 illustrates a simplified version of the effects in a two-sided model.

Direct network effect refers to the effect that the number of the same type of users positively correlate with the total value of the product or service offered by the platform. In the case of social networking platforms such as Facebook, the more friends are signed up to the platform, the more valuable it becomes. Indirect network effect refers to the value creation among two or more groups of users. Indirect network effect can be both positive and negative. Positive indirect network effect can be exemplified by E-commerce platforms like eBay. The number of buyers would increase the value of the platform for sellers, who can benefit from a larger consumer base. Buyers on the other hand can benefit from more sellers with more variety of products. Negative indirect network effect occurs when the complementarity of the two sides of the platform misalign. For example, the matchmaking website between men and women can seize to be valuable when one side of the subscribers overwhelm the other side. If the number of men far supersedes women

by a large margin, women tend to be overwhelmed by the number of males seeking to connect. The women users can be disturbed by the information overload. Men on the other hand may find lack of success in trying to connect with women discouraging, which consequently render the platform worthless. These negative effects can be offset by utilizing strategies such as pricing one side and subsidizing the other (e.g. Bhargava et al. 2013).

Based on the above characteristics, a wide spectrum of researches have been conducted in the service context. These researches are summarized in the section below. A list of short descriptions of these studies in the appendix can also serve as guide to the research area.

Three Categories of Research

"Service" and "platform" cover a wide spectrum of topics. Based on the papers' perspective of service platforms, this review divides the literature into three broad categories: (1) service architecture/modularity, (2) the platform's impact on services and (3) service platform strategy. The taxonomy is shown in Fig. 6.

The first category consists of research that applies "platform" thinking to the field of services. This category is referred to as "service architecture/modularity". Much conceptual work has been conducted, and the amount of research has been increasing. However, empirical research is still limited. Prior to 2008, only one paper was published on service modularity (Bask et al. 2010; Pekkarinen and Ulkuniemi 2008). The studies are based on the service industry. As a result of the fact that services in the traditional sense tend to adjust their offerings according to customer requests, a satisfactory degree of service modularity has not been observed (Bask et al. 2010). Pekkarinen and Ulkuniemi attempted to construct a model for service modularity. However, their research is based on the single case of a logistics service provider. The validity of their proposed model therefore requires further examination. Tuunanen and Cassab (2011) conducted a controlled experiment to determine the service process module reusability against the complexity of service, which sheds light on the research direction. However, the causes of low architectural leverage of platform capabilities in the service industry are still unclear, even though platform and modular design concepts in the service industry have not generated significant momentum.

The second category of literature focuses on how the platform has changed the way companies run their business. We have named this category the "platform's impact". This topic covers a wide spectrum of activities from innovation and operations to marketing and industrial architecture. Two subcategories have been identified. The first subcategory, "market disruption", consists of papers discussing how the introduction of the platform in the service industry has changed how service professionals conduct business. Seamans and Zhu (2014) discussed how Craigslist has influenced the newspaper industry. The second subcategory is called "service platform market condition". Craigslist has shifted the revenue model of the

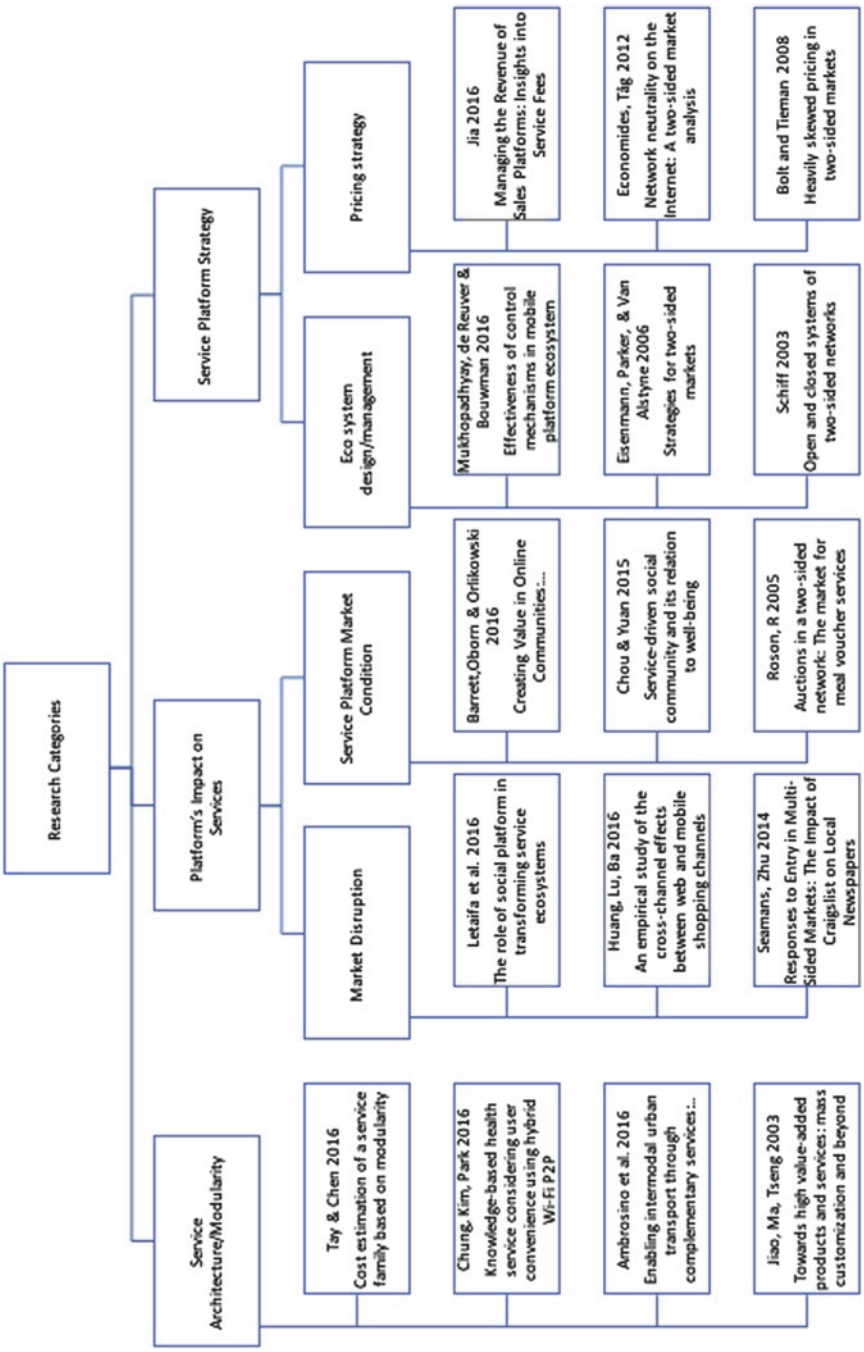

Fig. 6 Categories of research and sample publications

newspapers away from relying on targeted listing advertisings to subscription fees. These studies focus on how the service platform functions, without deliberately discussing the platform's architecture or network effects. Weiss and Gangadharan (2010) suggest that the innovation patterns of app service providers in the platform context differ from the traditional ones. Rather than expanding the breadth of services, they tend to focus on a particular type of app and increase its "depth" or volume within a narrow scope. Reisiger et al. (2009) take radio stations to be a two-sided platform and analyse the relationship between advertisers and radio service consumers. This stream of literature provides a rich understanding of the platform business. However, because of the wide spectrum of topics in this research stream, consensus among scholars on methodologies, concepts or research directions is rare. Nevertheless, the explorative studies are valuable in terms of determining important research questions for future research.

The final category shows the most prominent research directions for platform literature, evolving around what makes a company a platform leader and how a company can maintain its leadership position (Gawer and Cusumano 2008). The metric of leadership could be interpreted in many ways, for example, monetary, customer value and market share. Several empirical researchers have suggested that much of the information, such as financial data or customer value, is very hard to obtain or objectively determine; therefore, the most reasonable metric for the current platform research tends to focus on the number of users (Evans and Schmalensee 2010; Lin et al. 2012). This measure is also in accordance with the principles of network effect that the growth in the number of users increases network externality.

To achieve platform leadership, researchers have focused on the two characteristics of platforms, namely, how to leverage the technology core of the platform, known as "coring", and how to leverage the platform's network externality, known as "tipping strategy" (Lee et al. 2010; etc.). Using strategies from the technology side of the spectrum, a platform leader creates a high level of entry barrier for potential challengers. For example, Intel invests heavily in its microchip technology, which makes potential entry into the microprocessor platform more difficult. To leverage the network effects, platform owners usually create incentives to encourage network participants. This could be in the form of benefits for customers or providers. YouTube subsidizes its content providers by sharing advertising revenue generated by visitor traffic. Recent research has shown some promising strategies to maintain platform users through governance. Eaton et al. (2015) analysed the iOS platform and app offerings by encouraging certain types of offering and limiting others. Apple achieved higher customer satisfaction and therefore retention rate.

Challenges and Opportunities

The first challenge arrives from the advancements of Internet technology. Compared with previous studies of platforms with distinct psychical technologies, such as video cassette players and game consoles, in the setting of digital service platforms such as Uber and AirBnB, very few sunk costs, such as equipment purchase prices, are imposed on customers. From a transactional cost perspective, many information goods and services have virtually zero marginal costs (Gawer 2014). On the other hand, the "core" technologies provided by these newly emerged platforms are not particularly hard to create, given the ease of programming the modern Web and mobile technologies (Kim et al. 2012).

The second challenge is the adoption issue, which is characterized as a chicken-and-egg problem. One commonly agreed notion of platform network externality is that the increase in the variety and quality of product and service offerings tends to attract customers (Boudreau 2012; Hsieh and Hsieh 2013). The network externalities are dependent on both sides of the market; without a large enough customer base, providers are unlikely to join and innovate, and without enough offerings available, customers will not materialize (Eisenmann and Hagiu 2007). The current literature suggests a solution to the issue through capabilities (e.g. Tan et al. 2015), pricing (e.g. Bolt and Tieman 2008; Hagiu 2009), strategic alliances (e.g. Caesy and Toyli 2012) or ecosystem value co-creation (e.g. Ceccagnoli et al. 2012). Little research has focused on appealing to the provider side of the market (Hsieh and Hsieh 2013).

The strategy literature on the platform has highlighted the subsidizing supply side as a method to sustain platform leadership. For example, Intel could convince motherboard makers to adopt their PCI standard by committing its own microprocessor production volume (Gawer and Cusumano 2007). However, a substantial study of the factors that influence providers' adoption and innovation decisions is currently unavailable. As mentioned earlier, platform customers have very low sunk costs, which also reduces the switch cost and undermines the lock-in effect. The same applies to the provider side of the platform. Providers have also shown strong incentives to switch between platforms given the right circumstances (Lin et al. 2012).

Finally, the current research agenda of the platform with respect to adoption is generally limited to the economic and technological rationale of the platform strategy (Thomas et al. 2014). Recent research has pointed to areas of cognitive biases, such as the "bandwagon effect", which have been put into the research agenda (Xu et al. 2012). However, the results of this research have not been tested on a wider scale. On the one hand, some researchers have taken into consideration the intangible aspects of platform strategies. This type of research is still at an innate stage, and a systematic understanding of the platform adoption process is missing. On the other hand, marketing researchers have studied customer behaviour from a non-economic perspective. Phenomena such as word of mouth (Shin et al. 2014) and viral marketing (Palka et al. 2009), even B2C communication via sponsored mes-

sages (Magnini 2011), can have a significant impact on platform users' behaviour. There is a large research gap in terms of the study of complementors or service innovation contributors.

Many platform providers understand that the importance of platform success in constructing a meaningful business model relies heavily on the sheer number of participants. Therefore, in many cases of Internet-based platforms, the content is offered free of charge. Scholars consider pricing and access limitations to be potentially useful tools in terms of quality control (Economides and Hermalin 2015). Furthermore, platform leaders such as Apple tend to be able to manage the quality of the content of their platforms through the governance of boundary resources (Eaton et al. 2015). However, further studies on the quality aspects of the platform are not widely covered. Therefore, it would be particularly meaningful to understand what drives providers in a platform to innovate quality services.

Discussion and Conclusions

This systematic literature review was carried out on the service platform. This chapter provides a holistic overview of the current situation regarding this subject. The review shows that research on the service platform increased rapidly after 2008. A wide spectrum of research from different industries, methodologies and scientific disciplines has been covered. Despite the increasing interests in the service platform area in recent years, there are still many areas to be explored.

This chapter has identified the need for a better and more comprehensive theoretical foundation for the literature on the service platform. A converging view of platform has been observed among management scholars. However, the implication of services in the platform context has not been clearly identified. Comparative studies between service and technological platforms may shed light to further strengthen our understanding of the core concepts.

The service architecture research agenda needs to be further perused with more empirical data support. Many technical architectures have been proposed in the service contexts. However, a critical evaluation of such models based on longitudinal studies of multiple cases is still rare. A "dominant logic" of service platform architecture has not yet been observed in this stream of research.

Finally, despite a great number of directions that strategic management scholars have embarked on studying service platforms, some fundamental questions are still worth perusing. Among those, the "chicken and egg" issue of platform adoption is still central to the success of launching a platform. Current theories on adoption are mostly descriptive of the key stages of platform user growth, which tend to offer little predictive power. More fundamental causes of customer adoption need to be examined. Another aspect concerning customer loyalty of service platform may need further exploration. Platform-based services often tend to become "commoditized", where customers show little loyalty in switching between the service

providers. How a service platform can compete in terms of value proposition beyond matchmaking is an interesting and critical question.

In summary, we believe it is both timely and important to conduct this literature review on service platforms. This review identifies the current research streams and updates the research agenda. This provides exciting opportunities for management scholars to advance our understanding of service platforms. It is also valuable for readers in industry to identify their business' potential benefits and challenges from service platforms. An increasing number of firms are seeking to engage in service platforms. This comprehensive review of the cutting-edge researches and case studies can be used by organizations as a key reference when approaching service platforms.

Appendix I: Snippets of Publications

Authors	Year	Summary
Barrett, Michael; Oborn, Eivor; Orlikowski, Wanda	2016	The authors conducted a longitudinal field study of a health-care social platform. They identified a complex network in which the online community value is orchestrated
Tay, Choon Khai; Chen, Song Lin	2016	This paper presents a cost estimation model for the service family based on modularity
Lusch, Robert F.; Nambisan, Satish	2015	Service platforms, which enhance the efficiency and effectiveness of the service exchange by liquefying resources and increasing resource density
Hofman, Erwin; Meijerink, Jeroen	2015	This study finds that the service value is highest when the service provision is matched with the commonality potential of the services. The results indicate that using the wrong delivery channel decreases the service value, which could eventually decrease the service value for an organization's external customers
Eaton, Ben; Elaluf-Calderwood, Silvia; Sorensen, Carsten	2015	The tuning of 30 boundary resources can influence the innovation dynamics of the iOS platform
Seamans, Robert; Zhu, Feng	2014	Relative to newspapers without classified ad managers, the effect of Craigslist's entry on newspapers with classified ad managers has led to a decrease of 20.7% in classified ad rates, an increase of 3.3% in subscription prices, a decrease of 4.4% in circulation, an increase of 16.5% in differentiation and a decrease of 3.1% in display ad rates. Craigslist's entry has decreased the attractiveness of the newspaper to classified advertisers, which now have an alternative channel to reach newspaper subscribers. As a result, the affected newspaper decreases the classified ad rate. The newspaper now has a lower incentive to subsidize the subscriber side because each eyeball no longer generates the same amount of ad revenue as before, a finding that is consistent with the existing theory (e.g. Godes et al. 2009; Hagiu 2009)

(continued)

Authors	Year	Summary
Gawer, Annabelle; Cusumano, Michael A.	2014	This paper defines the distinction between internal and external platforms and emphasizes the importance of network externalities in these platforms. The Intel case is used to illustrate an ecosystem platform leader. A comparative study among IBM, Intel and Microsoft discusses their evolution towards platform leaders. A study centring on Google and Nokia in the mobile phone industry and a comparison between Microsoft and Apple in the software industry were used to further strengthen the evolution trajectories of the platform leaders and losers
Pon, Bryan; Seppala, Timo; Kenney, Martin	2014	This paper describes the transition in the mobile industry, where the device as a key asset to ensure a healthy ecosystem is no longer valid, and companies such as Google, with its Android platform, are proposing a new paradigm. Previous strategies to compete with operation systems are no longer relevant. This paper also analyses the gatekeeper roles of three such ecosystems in terms of the service-creation environment, identity management, service provisions and billing
Chen, Dongyu; Lai, Fujun; Lin, Zhangxi	2014	This paper examines lender's behaviours in p2p lending platforms. The authors proposed a model that user's trust in intermediary and trust in borrower would determine a platform user likelihood of lending. These two types of trust are based on 5 specific factors, which are familiarity of the platform, service quality, security protection, social capital and information quality.
Battistella, Cinzia; Nonino, Fabio	2013	This research establishes the relationships among the intrinsic/extrinsic motivations and the likelihood of using open innovation Web-based platforms
Hagiu, Andrei; Wright, Julian	2013	This paper identifies challenges for platform wannabes, such as sales efficiency, network size and competition
Bhargava, Hemant K.; Kim, Byung Cho; Sun, Daewon	2013	The authors propose a model to predict the optimal expansion strategies for start-ups and established firms to benefit from network externalities
Suarez, Fernando F.; Kirtley, Jacqueline	2012	Executive summary of four strategies: (1) Target an under-served segment of the overall customer base. (2) Leverage adjacent platforms to boost demand. (3) Differentiate their product to meet emerging needs. (4) Expand the universe of potential partners by simplifying the business model for partners
Madni, Azad M.	2012	Identifies trends of platform-based engineering, suggesting a more resilient and flexible adaptable PBE framework to avoid platform "lock-in", especially in the engineering aspect in the long term
Lu, June; Wang, Luzhuang; Hayes, Linda A.	2012	Optimism and insecurity influence the C2C platform's trust and functionality, which ultimately influence C2C satisfaction
Casey, Thomas R.; Toyli, Juuso	2012	The authors introduce a system-dynamics-based theoretical model to simulate the adoption of public and local wireless platforms. This paper highlights the importance of understanding complex feedback loops of the value network

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Authors	Year	Summary
Beltran, Fernando	2012	The authors use a two-sided platform concept to analyse the UFB market in New Zealand. The results show that a multi-sided market approach is beneficial to end customers, and network neutrality can be a catalyst for the deployment of broadband by combining access market and content market
Kim, Jieun; Lee, Sungjoo; Geum, Youngjung; Park, Yongtae	2012	The structure of digital content services using three building blocks: product, process and platform. Basically, two types of innovation pattern are established as divergence and convergence
Yoo, Youngjin; Boland, Richard J., Jr.; Lyytinen, Kalle; Majchrzak, Ann	2012	This paper summarizes (1) the importance of digital technology platforms, (2) the emergence of distributed innovations and (3) the prevalence of combinatorial innovation. Digital platforms are a means to promote distributed recombination innovations
Tuunanen, Tuure; Cassab, Harold	2011	Contingent to task complexity, modularized services positively influence customers' perceived value of services and their likelihood to engage in trials of service extensions
Kaplan, Andreas M.; Haenlein, Michael	2011	Identifies three justifications for micro-blogging to exist: virtual exhibitionism and voyeurism, pre-purchase marketing research and post-purchase customer relationship management
Luis Osorio, A.; Afsarmanesh, Hamideh; Camarinha-Matos, Luis M.	2011	Proposes a framework for integrating services
Jung, Jason J.	2011	Proposes a possible service-oriented architecture-enabled SC structure
Liang, Ting-Peng; Ho, Yi-Ting; Li, Yu-Wen; Turban, Efraim	2011	Service quality, relationship quality and website quality influence social commerce decisions
Shang, Shari S. C.; Li, Eldon Y.; Wu, Ya-Ling; Hou, Oliver C. L.	2011	Taxonomy of Web 2.0 service models introduced based on the knowledge-creation perspective
Zoric, Josip	2011	This paper introduces a techno-business modelling approach concerning the business model in a service platform design scenario. Using models from his work of 2010, he proposes scenario planning by mapping the services, service enablers, capabilities and resources to address the appropriate service platform design that is fit for purpose
Moon, Seung Ki; Shu, Jun; Simpson, Timothy W.; Kumara, Soundar R. T.	2011	This paper presents a module-based service model for mass customization. The model has a three-phase design: (1) service process identification, (2) service platform design and (3) platform strategy determination

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Authors	Year	Summary
Weiss, Michael; Gangadharan, G. R.	2010	(1) A small number of APIs provide the basis for the majority of mashups. (2) Mashup platforms were introduced in response to the increasing complexity of mashups, as mashups evolved from one-feature mashups (widgets). (3) The growth of the mashup ecosystem follows a pattern where keystone data providers or "powerful hubs" attract niche data providers as complementors, and the positions of keystones in the ecosystem are mutually reinforcing
Evans, David S.; Schmalensee, Richard	2010	(1) Platform businesses typically need to attain critical mass when they are launched in order just to survive. (2) With direct network effects, the basic problem is that the level of participation inthe platform affects the quality of the product it offers to participants; if the quality is too low, participation falls, which reduces the quality further, with participation declining towards zero
Luo, Xin; Li, Han; Zhang, Jie; Shim, J. P.	2010	Risk perception influences the adoption of Internet banking services
Beeflamme, Paul; Peitz, Martin	2010	This paper proposes a model that predicts the incentives for open platform sellers. For instance, in the two-sided single-homing environment, sellers would have more incentives to invest, whereas if the buyers were multi-homing, sellers would be less likely to invest
Lehdonvirta, Vili	2009	Hedonic and social attributes act as purchase drivers
Reisinger, Markus; Ressner, Ludwig; Schmidtke, Richard	2009	In addition to considering participation externality, *pecuniary* externality, such as the revenue stream, can also have an influence on the dynamics of a two-sided platform. The research takes radio stations as a two-sided platform and analyses the relationship between advertisers and radio service consumers
Tee, Richard; Gawer, Annabelle	2009	Industry structure can be a determining factor for the success or failure of mobile Internet services
Hagiu, Andrei; Yoffie, David B.	2009	MSP does not guarantee a participant's success; a company should align its product and service offerings with the type of platform activities in which it should engage
Reinartz, Werner; Ulaga, Wolfgang	2008	A flexible service platform can help companies to sell services more profitably and potentially achieve higher customer satisfaction
Lai, Linda S. L.; Turban, Efraim	2008	There is a positive correlation between network value and user content. Services are defined in general terms, such as self-serving services and collaboration services (Google talk)
Pekkarinen, Saara; Ulkuniemi, Pauliina	2008	Service modularity's success depends on the manager's knowledge in terms of choosing the correct processes and coordinating such modules to the organizations
Bolt, Wilko; Tieman, Alexander F.	2008	The most elastic side of the market is used to generate maximum demand by providing it with platform services at the lowest possible price. Full participation of the high-elasticity, low-price side of the market attracts the other side. As this side is less price-elastic, the platform is able to extract high prices
Gawer, Annabelle; Cusumano, Michael A.	2008	Through a series of cases from several industries, the authors offer strategic guidance for companies to achieve platform leadership

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