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Towards Building a Value Co-Creation Circle in Social Commerce

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Towards Building a Value Co-Creation Circle in Social Commerce

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Towards Building a Value Co-Creation Circle in Social Commerce

ABSTRACT

The rise of social commerce has brought several new challenges for firms and reshaped the way people purchase products and services. Firms are struggling to co-create value with customers to identify their needs and offer innovative products. To address these challenges, this study proposes a value co-creation circle and explores the key factors for developing a successful value co-creation circle on social commerce platforms. A case study of a taxi company in Taiwan was conducted. Data was collected from face-to-face interviews with the managers and analysed using Google Analytics. The proposed value co-creation circle not only creates benefits from network externality by the growth in membership, but also enhances service quality in the social commerce platform. This study explores a new perspective of the value co-creation circle in the social commerce environment that allows practitioners to develop a value circulation by network externality and co-create value with customers.

Keywords: Social commerce, value co-creation, google analytics, customer engagement

1. Introduction

In recent years, consumers have increasingly relied upon user-generated content such as online product reviews and recommendations to make their purchase decisions (Tse et al., 2016). This trend revolutionises traditional e-commerce into social commerce, where social features are incorporated into online shopping sites that promote consumers' interactions during purchase (Hajli et al., 2017). Social commerce is defined as "forms of Internet-based social media that allow people to actively participate in the marketing and selling of products and services in online marketplaces and communities" (Stephen & Toubia, 2010, p. 215). Social commerce platforms can create an environment where firms can harness their offerings to deliver incremental value to their customers and engage them in value co-creation activities (Cayla & Arnould, 2008; Wang & Zhang, 2012). Value co-creation activities include the co-ideation, co-design and co-development of new products' activities (Prahalad and Ramaswamy, 2004). These value co-creation activities, if they are effectively managed on social commerce platforms, strengthen the relationships among stakeholders (e.g. customers, suppliers, platform providers) and thus help firms obtain competitive advantages in the market (Vargo & Lusch, 2004).

To understand how value can be co-created, prior studies have focused on crafting unique customer experiences through a co-creation process, as well as demonstrating the nature, process and practices of value co-creation (e.g. Hatch & Schultz, 2010; Payne et al., 2009; Ramaswamy & Ozcan, 2015; Schau, Muñiz, & Arnould, 2009; Wang & Hajli, 2014). Published work has also discussed consumers' motivations to participate in value co-creation processes (Roberts et al., 2014; Payne et al., 2009; Xie et al., 2008). Although these studies provide an understanding of value co-creation with customers and offer new practical insights in exploring the impact of value co-creation on firm performance, other stakeholders such as suppliers and platform providers are noticeably absent from the value co-creation process. Little is known about how all stakeholders engage in the value co-creation activities in the context of social commerce.

We seek to fill this gap by proposing a value co-creation circle in social commerce. This circle illustrates the interaction among value co-creation activities which can represent the reality and complexity of relationships that exist in business environments (Díaz-Chao, Sainz-González, & Torrent-Sellens, 2016). The main goal of this study is to develop the value co-creation circle in the social commerce platform and explore how the value co-creation circle can be recycled with minimal investment and budget. We use the largest taxi fleet in Taiwan as the case for the research. The remainder of the paper is organized as follows. In Section 2, we review the literature on value co-creation; in Section 3, we propose the theoretical model and associated propositions guiding this research; in Section 4, we describe and present the results of our analysis; in Section 5, we discuss the conclusions and contributions of this study for management scholars and practitioners. Finally, we provide several suggestions for future research.

2. Theoretical Background

2.1. Value Co-creation

As defined by Prahalad and Ramaswamy (2004), value co-creation is the collaboration between a customer and a supplier in the activities of co-ideation, co-design and co-development of new products. In marketing literature, it is well known that value can be created in the co-creation process where the customers shift from being a passive audience to an active partner working with the suppliers (Prahalad & Ramaswamy, 2004; Vargo & Lusch, 2004; Payne et al., 2008). This consensus was developed in studies in the field of relationship marketing (Prahalad & Ramaswamy, 2000), which highlight the importance of a

paradigm shift from a goods-dominant logic to a customer-centric logic. Prahalad and Ramaswamy (2000) posited that customers are the source of a firm's competence and suggested that firms should offer more resources and activities to collaborate with customers in order to maintain their long-term partnership, rather than focusing on creating core products. Drawing on the customer-centric (Sheth, Sisodia, & Sharma, 2000) and market-driven logic (Day, 1994), Vargo and Lusch (2004) proposed a service-dominant logic and argued that customers become good co-creators of value when they engage in dialogue and interaction activities with their suppliers. The service-dominant logic concurs with earlier studies and posits that values are likely to be maximised as firms understand customers' value-creating processes and support these processes by providing full transparency with respect to product and firm information (Vargo & Lusch, 2004).

Prahalad and Ramaswamy (2004) contend that value creation between customers and suppliers is built on a unique experience environment in which customers have high-quality dialogue and interactions with their suppliers as well as having access to suppliers' resources. Likewise, Payne et al. (2009) developed a process-based brand value co-creation framework consisting of customer value-creating processes, supplier value-creating processes and encounter processes that help organisations build the brand relationship experience with stakeholders. This framework also makes it possible for organisations to identify co-creation opportunities through technology solutions, develop a sequence of relationship experiences (e.g., providing a short tutorial for products) for their customers and establish appropriate metrics to measure the delivery of customers' relationship experience regarding their emotion, cognition and behaviour. A typical example of value co-creation provided by Hatch and Schultz (2010) is LEGO Group's online brand communities. These online communities enable LEGO's employees to engage in dialogue and interactions with their fans and track the fans' preferences in order to respond promptly to their needs.

1.1 Value co-creation in social commerce

While some researchers view technological breakthroughs as catalysts for building robust customer relationship experiences (Payne et al., 2008; 2009), previous studies (e.g. Cayla & Arnould, 2008; Hatch & Schultz, 2010; Schau et al., 2009; Ramaswamy and Ozcan, 2015) have argued that value co-creation can be fostered in the social media environment (e.g., on social networking services, online brand communities and forums). For example, Schau et al. (2009) observe multiple successful brand communities that have established a

process of collective value creation with their customers. Brand value can be increased over time when members engage in community activities (e.g. documenting, badging and milestoneing), effectively use social networking tools (e.g. welcoming and empathising), share brand use experience (e.g. commoditising and caring for the brand) and manage the impression of the brand (e.g. sharing the brand “good news” and inspiring others to use a certain brand).

Value co-creation through social commerce requires user participation, trust and commitment (Hajli et al., 2014). Social commerce platforms provide an interactive communication channel for organisations to take opportunities to enrich engagement and interaction. It is clear that social commerce caters to a wide range of audiences and maintains a richness of information. It also creates many opportunities for collaboration. Social commerce platforms are virtual platforms that enable users to share their experiences and information and express themselves socially. Meanwhile, social commerce can be used as a collaborative tool by a group of people to interact and work together, using platforms to obtain a shared outcome. Therefore, a social commerce platform is an enabler of value co-creation.

2. Research Model and Propositions

Drawing on prior studies on value co-creation, we develop a conceptual framework of the value co-creation circle, as shown in Figure 1. This framework explicates how value can be co-created through four key elements: social commerce platform, customer engagement, organisational resources and value co-creation practices. Five associated propositions (P1-P5) are presented to explain the relationships among social commerce platforms, customer engagement, organisational resources and co-creation value.

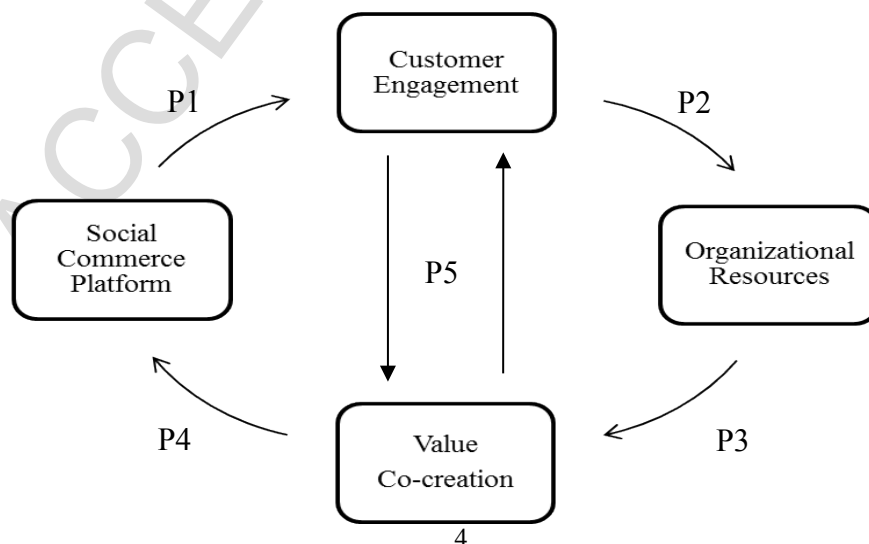


Figure 1. Value co-creation circle in social commerce

2.1 Social commerce platforms and customer engagement

Social commerce platforms that integrate with customer-oriented social features (e.g., recommendation, rating, and referral) has become increasingly an effective way to stimulate customer engagement (Tajvidi et al., in press). Social commerce platforms can be viewed as computer-mediated social environments, where social interactions occur among users (Wang & Yu, 2017). These social interactions enable firms to engage the customers in social shopping activities and thus improve their brand loyalty (Islam & Rahman, 2017). Building on the guanxi perspective, Lin et al. (2018) point out that consumers are more likely to engage with companies through social commerce platforms when they perceive strong informational and social support from friends and high relationship quality. Indeed, social commerce platforms can empower consumers to share shopping information with each other and enhance their collaborations in consumer-generated content (Liang et al. 2011).

Network externality is defined as “the phenomenon that the increased value of a product is affected by the number of those who use similar or compatible products” (Liu, Li, & Kou, 2015, p.1). Lin & Lu (2011) apply network externalities to explain why people engage in a social networking site. They find that the number of peers in a social networking site have positive impact on users’ perceived usefulness and enjoyment. The positive network externality could attract more members and add value to the platform. The platform will eventually expand to a digital self-generated ecosystem (Shy, 2001). The members’ interaction triggered by social commerce platforms has obviously supported to engage the members. Therefore, we propose the following:

Proposition 1: Social commerce platforms featuring innovations can attract more customers to engage in the interaction in the digital platform.

2.2 Customer engagement and the acquisition of organisational resources

New customer value creation is the main generation of a market-driving strategy to ask for a distinct set of capabilities (Tuominen, Rajala & Moller, 2004). The firms become market driving with proactive business logic and are capable of the push of their capacity in order to create new customer value (Berghman, Matthyssens, & Vandenbempt, 2006).

Market-sensing and customer-linking capabilities put more emphasis on firms' need to catch up the market sensitivity and the trade of the altering customer necessities and need to keep up, react or innovate the change (Day, 1994; 2002; 2003). The generic support activity categories of the value chain are procurement, technology development, human resource management and firm infrastructure. These can be used to draw the generic value chain (Porter, 1985). These are the different kinds of resource on the platform. Berghman et al. (2006) suggest building three types of competences: marketing practices for external knowledge absorption, general organisational competences and supply chain/network competences.

Kim & Shin (2016) mention five elements, including platform content, consumer support, user interface, brand reputation and activity reward, which can develop a community of online brands in a social platform (Kim & Shin, 2016). To co-create an integrated system, we need to maintain the core flexibility of adapting to customer-related interference. Then, the flexibility plays a role that creates value through the use of operand resources, an integral part of co-creative processes, in the interactions between the firm and the customer (Chathoth et al., 2016). In summary, more customer engagement can bring more resources about brand reputation, interface, financial support, etc. Therefore, we present the following proposition:

Proposition 2: More customer engagement can bring more organisation resources to support innovations in the social commerce platform.

2.3 Organisational resources and value co-creation

The value co-creation can be defined as a series of activities performed by the co-creators (e.g. customers, employees, and organizations) to achieve a particular goal (Payne, Storbacka, & Frow, 2008). Service-dominant logic contends that these co-creators in the value creation processes are resource integrators and they are able to integrate operand and operand resources to support the co-creation activities and interactions when a service occurs. (Edvardsson, B., Tronvoll, & Gruber, 2011; Lusch & Vargo, 2006). Operand resources consist of tangible resources such as economic resources and goods/materials, while operand resources constitute physical, cultural and social resources (Baron & Warnaby, 2011). The effective way to create value is to obtain access to the amount of operand and operand resources and effectively use them (Normann, 2001). In the context of online community, Wang et al. (2016) examine the impact of sales' online social identity and social comparison

as social resources on co-creation innovative value practices in B2B markets. They found that social resources provided by sales representatives embedded in online communities could stimulate other members' intention to co-create innovation. Hence, we argue that organizational resources act as the foundation of value co-creation and can bring new value to the service platform with the cooperation between customers and managers. Therefore, we present Proposition 3:

Proposition 3: firms could utilize the organisational resources that are triggered by customer engagement to co-create value with stakeholders in the social commerce platform.

2.4 Value co-creation and social commerce platform

More and more scholars discuss the issue that customers are considered as value co-creators, and the strategies of competition and the innovation processes are not just as the products and values acceptances in the firms (Franke & Piller, 2004; Schau et al., 2009). There are four methods that customers employ to co-create value in brand communities: social networking, impression management, community engagement and brand use. The customer brand communities put more concern about practicing value creation, then they make more efforts together to enhance the value comprehended by people (Schau et al., 2009). The digital engagement platforms (EPs) appear as touch points beyond purchase in internet worlds, and people can integrate resources and co-create value there between them and the firms (Blasco-Arcas et al., 2016). We therefore notice that the needs of customers are the main consideration and stimulation to create value in the social commerce platform. The following proposition is proposed:

Proposition 4: The platform managers could co-create value with stakeholders to enhance the innovation in the social commerce platform.

2.5 Customer engagement and value co-creation

Customer value theory, proposed by Woodruff (1997), contends that the comprehension of customer perceptions of value-in-use and creating the customer value hierarchy model are important for suppliers. The managers need to realise and create value for customers, and then develop the delivery processes of service or product. Therefore, the customer is the core component in the service supply chain (Sampson & Spring, 2012), and displays the customer

involvement degree in the value creation process by obtaining the services activities. It shows the importance of customer engagement in the value creation of service innovation.

Business marketing managers aim to guide the value creation to develop and demonstrate their new value creation in potential capability and to stimulate partners to cooperate in the network (Berghman et al., 2006). The corresponding value chain configuration presents the main characteristics of the long-linked value creation logic. The five generic primary activity categories of the value chain are: inbound logistics, operations, outbound logistics, marketing and sales, and service (Porter, 1985, p.39-40). Therefore, the firms can create value to customers by the innovation activities and the improvement of the network.

Multimedia digital networking information technology has been widely applied on the community-based information networks to build up a business model focusing on new customer value creation. The top managers invest in IT to establish community-based information networks and allow business innovation founded on the improvement of competitiveness and enhancement of customer service (Kodama, 1999). Diverse needs of customers have influences on the mobile internet with internet functions and wireless functions that develop in ubiquitous networks and build up the intelligence network environment (Sawng et al., 2015). The customer engagement and their experience can create an engagement platform that supports co-creation types follow the service-dominant logic (Chathoth et al., 2016). Therefore, we mention a fifth proposition:

Proposition 5: Strong customer engagement can boost value co-creation activities in social commerce platforms. Subsequently, value co-creation can raise customer engagement in the social commerce platform.

3. Research method

3.1 Research design

The epistemological foundation of this study is grounded upon the interpretivist paradigm. The case study method is particularly applicable for interpretivist research. Another reason for the recognition of case study as a research approach is the nature of the research question that is being investigated. We observed the practices and operations in our case and generated the useful evidences to support our research model and propositions (Eisenhardt & Graebner, 2007; Yin, 2009). As this study aims to produce an understanding of

how value can be co-created, it is appropriate to choose the case study approach.

3.2 Case background

We selected the Taiwan Taxi Fleet Company as our case study. This company is the largest scale taxi fleet in Taiwan, with over 17,000 taxis, and its market share reaches 20%. The firm was established in 2005 and its capital is over 1.5 million United States dollar (US\$). Its main business services include GPRS dispatch business for taxis, and an advertising service. Their main revenue consists of several sources: (1) every driver pays the flexible fees (on average US\$119.1 to the firm every month per driver); (2) the driver accepting each dispatch call order pays service fee of US\$0.34 to the firm; and (3) other telecommunication firms and advertising revenue of the car and mobile app.

Recently, the Taiwan Taxi Fleet Company improve the service delivery process and the interface of customer interaction through using the following social commerce platforms: company website, Facebook, Line, blog and mobile app. Payment methods, such as Apple Pay, Alipay and mobile payment, are also included in the social commerce platform. Moreover, their social commerce platform allows customers to rate the driving service and provide comments regarding user experience. Therefore, this case provides an appropriate context to understand how value can be co-created with customers through social commerce platforms, customer engagement and organisational resources.

3.3 Data sources and collection

We collected data using the following sources and research methods: 1) extensive archives (including corporate annual reports, internet sources, and business publications); 2) interviews with leading experts; 3) data from industrial conferences; 4) repeated semi-structured interviews with managers of the focal firms and their firms; and 5) informal follow-up interviews conducted using e-mails, phone calls, and observations.

The triangulation of the data collected from multiple sources at multiple times increases the reliability of the results (Jick, 1979). Therefore, we interviewed the top managers involved in the development of 'big data' and obtained the relevant information about the strategies of service products and processes in the social commerce platform. The objectives of the interview are described in Table 1. We also collected the annual reports, internet sources and business publications to achieve the triangulation reliability of the results.

Table 1. Objectives of the interview

Date	Hours	Objectives
11/5/2017	2 hours	To understand the background of the firm and its social commerce platform.
25/5/2017	2 hours	To understand the operation process of service delivery and how the social commerce platform works.
8/6/2017	2 hours	To understand the variables and sources of data for Google Analytics.

3.4 Google analytics (GA)

Google Analytics was introduced in 2004 and is a well-known free measurement tool. It can be used to analyse website information widely by sending a tracking tag signalling that the web page has been displayed. The GA measurement tag is placed on each web page of the websites. Google collects the tracking of web that the recording is at the endpoint and provides a more entire illustration of user behaviour to the website operator. GA has some advantages in that it has a widespread extent of characteristics and benefits with an easy-to-use and helpful interface. It can encourage website managers to analyse the website information using free available GA data.

The main perspective of Google Analytics is limited in a marketing viewpoint and the relevance and effectiveness of the service and the online usage may be bounded by the operators and members' demands and desires. Its primary and essential two purposes are to measure the effectiveness of advertising in sending traffic to a website, and the effectiveness of a website's 'conversion funnel'. The method of data collection via Google Analytics is a fair and accurate representation of usage. The feature shows that big data collected by GA can satisfy the online operators' advantage to enable transformation model in a practice-based perspective. Big data can exhibit the causal relationships among big data analytics capabilities, IT-enabled transformation practices, benefit dimensions and business value (Wang, Kung, Wang, & Cegielski, 2018). There are several important indicators to complement the evidence to our research. The indicators include *Demographics*: The statistic numbers of the customers' ages, sex, geography area, interests, etc. *Behaviour*: New visitors and returning visitors, frequency and the rate of return visiting, positive engagement, etc. These indicators are used to analyse the users browsing the pages and leaving web pages. *User explorer*: The number of transactions, the time of taking taxi, etc. These indicators are used to analyse the object group and active users' behaviour, user process, and habits. *Pages speed*: The speed of loading pages, the operation time of web pages, speed suggestion,

bounce rate, etc. *Searching in the website*: The key words in the web site, the searching webpage, using situation, etc. *Conversions*: The results of best sale products, deal numbers, the period of the users returning, the information of the members, the length of routes, etc. *User segmentation*: Special groups, such as: Ages, languages, main customer groups and potential buyers. We also check the information and explanation of these data. We investigate the data through the diverse evidence and avoid personal perspective and opinion bias, then, to fit the principle of triangulation (Jick, 1979) to maintain the research reliability and validity.

Our analyses are based on the results provided directly by GA. The GA data is used as our primary source, including the stickiness of the app to analyse customer behaviour and observe customer interaction and preference. As the measurements start at slightly different times, a common period is selected for the analyses and it continues for one year, from 1st January to 31st December 2016. The measurement is continuous, with the exception of the business in the digital platform. We collect data resources from the app of members, call numbers and the revenue from the drivers and online members. Then, we get the project budget from the interviewer manager. Other related numbers are collected by voice telephone, called car machine, website and other channels. We use the Google Analytics website to analyse data in the social commerce platform and demonstrate our research model of a value co-creation circle in social commerce.

We collected the following data: 1) number of new members each month in one year, 2) successful call numbers, 3) R&D investment budget, 4) marketing budget, and 5) rate of customers recalling the car. We define the description of each indicator in Table 2. The keywords that used to extract the core concept from the interview transcripts are shown in Table 3.

In order to analyse the cases using GA, we collected seventeen indicators of advanced web metrics, including the most common advanced web metrics defined in the literature. The matrix includes into four main indicators: number of dispatch calls, number of dispatch calls from members, number of new app downloads, and total number of app downloads. This helps to provide an understanding of the usability of the app platform. The growth numbers of members are measured by the indicator of new members each month and the total members each month. The revenue is accounted by the total number of successful of car dispatches multiplied by the revenue of each call. More added benefit functions of the app for customers are supported by the R&D budget of three main R&D plans; the customer

stickiness of app is calculated by how many new and existing members recall the car by app within 90 days.

Table 2. Indicators used in this study

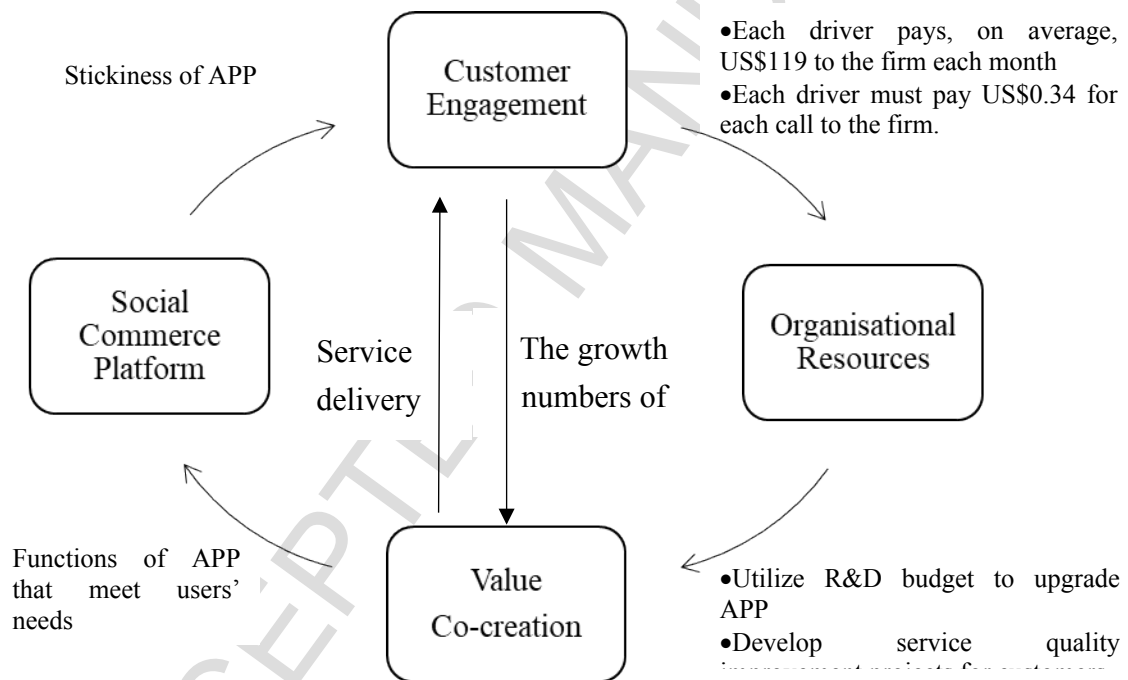
Key performance indicators	Descriptions
Members	People who register on the official website and/or the app.
Number of calls	The call car tasks, including appointments, whether or not dispatched successfully. Excludes duplicate calls and voice auto recall.
Membership growth	The increase in registered members within one year.
New members in each month	The number of people who downloaded the app each month.
Total members each month	The total number of people who downloaded the app within one year. The numbers mean the app members continue to increase each month.
Revenue	The revenue created from the app platform.
The revenue of each call	One successful call can bring US\$0.34 revenue to the firm.
Dispatch call numbers	The numbers of phone calls which result in a car being dispatched successfully.
Numbers of member calls	The total numbers of members who call a dispatched car.
Average numbers of member calls.	The total number of dispatch calls divided by the total number of members. That means the average frequency that one member calls a dispatched car in one year.
Value Co-creation	Add several innovative functions which the online members need to improve the app valuation.
R&D budget	The firm support the R&D plans with a budget to improve the app's functions. There are three main R&D plans in 2016.
App version 6.0	The new app version with revision and improvement of function and interface.
Multiple-type taxis	A new service to provide the privacy car with a legitimate license for members to choose and also provide several customised services, such as a taxi service booking system, a matching system for the drivers and the members and the driver management system.
The improvement of multiple payment functions	To enhance the app interface to support the new payment functions, including QR code, NFC sense function, credit card service, electronic wallet, etc...
App stickiness	Defined by: number of new and existing customers recalling a car using the app within 90 days of first use.
New members recall	Number of new members who call the car again by app within 90 days.
Existing members recall	Number of existing members who call the car again by app within 90 days.
Total recall car rate	The total recall car rate is that the members recall the car again from the app, voice calls, convenience stores, website and other channels within one year.

Yearly growth rate successful tasks	The growth rate of members' call tasks which have been dispatched successfully and finished between Jan and Dec 2016.
Recall car rate in different channels	The recall car rate in the channels of voice media, convenience store, app, website and others.

Table 3. Keywords of the dimensions

Dimensions	Key words examples
Customer engagement	Provide, support, mention, suggest, interact, grades, response, etc.
Organisational resource	Revenue, performance, budget, etc.
Value co-creation	Create, enhance, improve, involve, service innovation, value, etc.
Social commerce platform	Function, platform, app, etc.

4. Results

**Figure 2:** The relationship of the dimensions and indicators

4.1 Circle 1: Customer Engagement-Organization Resource-Value Co-Creation

There have been over 2 million downloads of the app. About 1.1 million to 1.2 million members are using the app continuously. The case company enables to gain US\$0.34 when each driver takes one successful dispatch. When we interviewed the top manager of the department of the development of big data, he indicated that “*we will use part of the revenue*

from the app to enhance the functions of the app, such as R&D, multiple-type taxis, etc.”

Therefore, the revenue can be used towards the R&D budget to improve the functions of the app. The improved functions not only allow the customers to use the app more easily and conveniently, but also create value to the customers. Therefore, we confirm that customer engagement can bring new organisational resources (e.g. revenue and membership fees), which the company uses to enhance the functions of the app.

4.2 Circle 2: Customer Engagement-Value Co-Creation-Social Commerce Platform

Customers are able to provide their feedback regarding experiences and problems of using the app platform. This includes the app operation functions, taxi call assignment, interface design or marketing information. Managerial issues include drivers' service attitude training and lack of interaction with the customers. As shown in Table 4, the problems raised from customer feedback have been solved and gradually decreased from the third quarter in 2016 to the quarter first in 2017. This implies that the service can be improved through customer engagement and value co-creation activities.

Table 4. Problems raised from customer feedback

Problems raised from customer feedback		2016		2017
		Q3	Q4	Q1
Interaction	Drivers' working situation	60	36	24
	Customer service	13	1	5
	Cannot grade the drivers	4	10	0
App operation functions	Fixed location problems	25	24	17
	App close suddenly or not stable	65	30	12
	Credit card or Easy Card problems	30	8	12
	Cannot connect Wi-Fi or log in	38	26	4
	Registration or log in problems	14	10	5
	The task cannot end normally	0	0	2
	Favourites disappear	0	4	1
	Cannot delete the taking record	2	1	0
	Cannot predict the car fee	0	1	0
	Operating difficulties	21	0	0
Taxi call assignment	Cannot cancel the taxi call	0	0	7
	Failed taxi call	0	0	6
	Cannot call a taxi	26	15	5
	Called duplicate cars	16	6	4
	Repeat car calling	2	5	1
Marketing	Advertisement	0	0	5
	Taking taxi ticket	0	1	0
	Too many push messages	0	8	0
	Did not receive customer incentive	0	1	0

	ticket			
	Did not show the push message content	1	1	0
Interface design	Beauty	3	3	0
	The older interface is better	12	0	0
	Missed location	3	0	0
System security	Privacy information security	4	0	0
	Internet speed slow	10	0	0
	Address complement	1	2	0
	Easy Card machine problem	0	1	0
Total		350	194	110

4.3 Customer engagement

The Taiwan Taxi Fleet owns over 17,000 dispatch cars. We investigated the related data, including membership growth, the new and total download numbers, the number of dispatch calls, the number of dispatch calls, the average number of dispatch calls per member in 2016, average of new download numbers and growth rate of download numbers in 2016. The related data is shown in Table 5. We collected data about the members and the dispatch cars each month, then worked out the trends and the statistical distribution. As shown in Table 5, new download number, which continue to grow up averagely, is 64,383. The total growth rate of download numbers in 2016 was 34%. The download numbers also continue to grow and show stable growth. We also show the linear figure of dispatch trend in Figure 3.

Table 5: Numbers of successful car dispatch each month

	No. of dispatch calls	No. of dispatch calls from members	Average number of dispatch calls from each member	No. of new app downloads	Total No. of app downloads
Jan.	1,750,940	257,141	6.81	74,218	1,577,512
Feb.	1,375,071	246,657	5.57	60,811	1,638,323
Mar.	1,596,712	246,598	6.47	56,316	1,694,639
Apr.	1,153,701	229,430	5.03	49,234	1,743,873
May	1,170,534	232,089	5.04	48,549	1,792,422
June	1,324,089	251,091	5.27	60,012	1,852,434
July	1,179,971	243,066	4.85	60,257	1,912,691
Aug.	1,194,590	237,070	5.04	54,727	1,967,418
Sep.	1,650,659	297,298	5.55	108,253	2,075,671
Oct.	1,338,208	267,929	4.99	73,326	2,148,997
Nov.	1,213,233	251,225	4.83	61,224	2,210,221
Dec.	1,293,127	263,482	4.91	65,667	2,275,888
Total	16,240,835	3,023,076		772,594	
Average number of calls each month			5.37		

from each member (2016)		
Average number of new downloads each month	64,383	
Growth rate of download numbers in 2016		34%
Growth rate of app revenue		52.5%

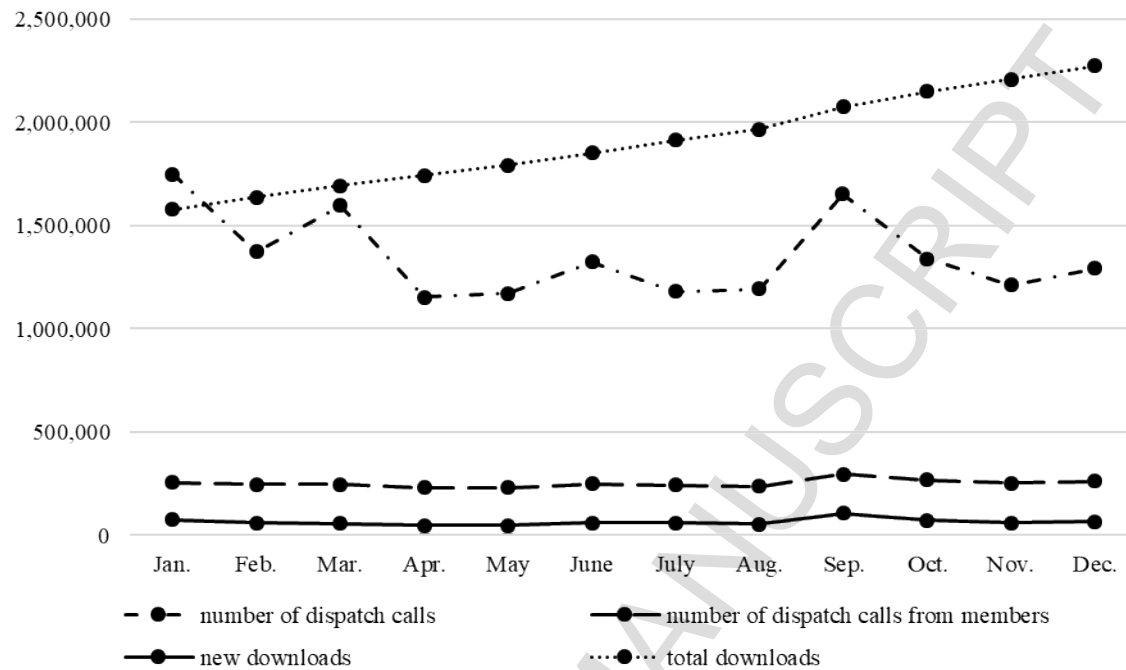


Figure 3. The related numbers of dispatch in the app

Figure 3 shows that the total download numbers are continuously increasing and dispatch call numbers are maintained at 1.1 to 1.7 million. The number of dispatch calls from members and the number of new downloads each month remain stable.

The growth of membership can increase network externality and create more benefit and value to the firm (Shy, 2001). Network externality, also known as the network effect or demand-side economies of scale, means that when the value of a product increases with increasing numbers of people using the same product, or using compatible products, the network externalities will appear. In a network environment that consists of products with network externalities, the value and effectiveness of a product is always improved with an increase in new consumers entering the digital market (Allen, 1988; Au & Kauffman, 2001; Brynjolfsson & Kemerer, 1996; Lee, Lee, & Lee, 2003). The situation appears not only in network environments (such as telecommunications, mass media and packaged computer software) but also in web-based services such as electronic mail systems, online games and instant message services. The valuation of network externality is worth investigating and demonstrating empirically. The growth in membership shows the improvement of

performance and enhances the network externality in the digital platform of the app at the same time. That shows the members can create the value for the digital value chain.

Therefore, the results support propositions 1 and 2.

4.4 Organisation resources

As shown in Figure 3, the total number of dispatch calls from the app in 2016 was 16,240,835. Each dispatch call gives the firm US\$0.34. The total revenue, therefore, from app dispatch calls in 2016 is US\$552,653.72. The average number of calls from members per month in 2016 is 5.37. Each member will create US\$1.83 each month for the firm in 2016. The total number of downloads in 2016 was 2,275,888. The predicted revenue from this is US\$415,881.78. We found that the actual revenue greater than the predicted revenue: US\$1,367,719.2. That shows the members can create more benefit than predicted revenue for the firm through the digital platform of the app. The other resource of revenue is the fee from the 17,000 drivers, and the average fee is US\$119 every month. Multiplying the monthly fee by 12 months, and then by 17,000 drivers gives a revenue of US\$24,296,457.62. The total revenue from the app is US\$29,822,994.86. The total revenue of the firm is US\$56,781,127.71. App revenue makes up 52.5% of the total revenue. The revenue of the app increases stably every year. The revenue from the digital platform can be used to support R&D budget plans. The budget is shown in Table 5. Customer engagement can bring resources to the firm. Thus, the results support Proposition 2.

4.5 Value Co-creation

The firm have developed three R&D projects to improve the functions in the social commerce platform. The first project is to update the app from 5.0 to 6.0 version. The app 6.0 version adds new functions to improve service quality such as accurate GPS positioning, random calling cars by the road with tied credit card, multiple-types taxi, designated driving service, predicting cars, the new design of interface and the new service connections of go2gether, and the revision Housekeeper of Life. In the second project, the case company collaborates with local government to provide legitimate licences to members who have a privacy car. These members allow using customised functions in the platform, such as an online taxi booking service system, the matching system for the drivers and the members to dispatch a car and the driver management system. The third project is mainly to provide ease of use for the app interface with diverse and new payment functions, including the third-party

payment platforms Alipay, allPay Digital Payment and JKO pay; and other payment methods including QR code, NFC sense function, credit card service, electronic wallet, etc.

Therefore, the case company has gained the benefits from these value co-creation activities in terms of incremental innovation, (enhancement of the operation process), modular innovation (revision of the interface of app 6.0), and radical innovation (service of a new and legitimate taxi type - the privacy car – which is very different from the previous yellow taxi design). The analysis of the three R&D projects and the innovation typologies are shown in Table 6. Thus, the R&D projects, with the budget from the revenue of the app platform, supply a diverse and technologically new service and add value to members in the digital platform of the app. As the results show, the propositions of 3, 4 and 5 are supported.

Table 6. The analysis of the three R&D projects and the innovation typologies

R&D plans	App version 6.0	Multiple types taxis	Multiple payment functions
The budget of the R&D plans in 2016	US\$1,531,289.35	US\$170,143.26	US\$51,042.98
Incremental innovation	The modification of interface design		
Modular innovation	The improvement of interface functions with new service		Provide diverse payment channels and functions
Architectural innovation		Provide a new system of multiple types taxi project	
Radical innovation		Provide a new and legitimate taxi type	

4.6 Social commerce platform

We investigated the app's stickiness by recording the recall rate from members and compared the recall car rate from the app with channels (convenience store, website and others). The related data is shown in Table 7 and Figure 4. Table 7 shows that the recall rate of new and existing members using the app within 90 days are both higher than the total members of all other channels. The annual growth rate of new and existing members is 56.56%. That means the app members have higher customer stickiness than other channels members. Figure 4 shows the recall car rate from different channels. The car recall rate of the app is 64% higher than other channels. That means the members will call a car again by app more than using other channels. Thus, the results also provide the evidence that the app members have higher customer stickiness than other channels and the platform of the app can

create more value for the digital value chain. The results show that Proposition 1 is supported.

Table 7. Rate of car recall by app within 90 days

	The car recall rate by app within 90 days	Year growth rate of members of successful task
New members of app	54%	+1.3 %
Existing members of app	37.5%	+4.3 %
Total members of all channels	29%	+10.1%

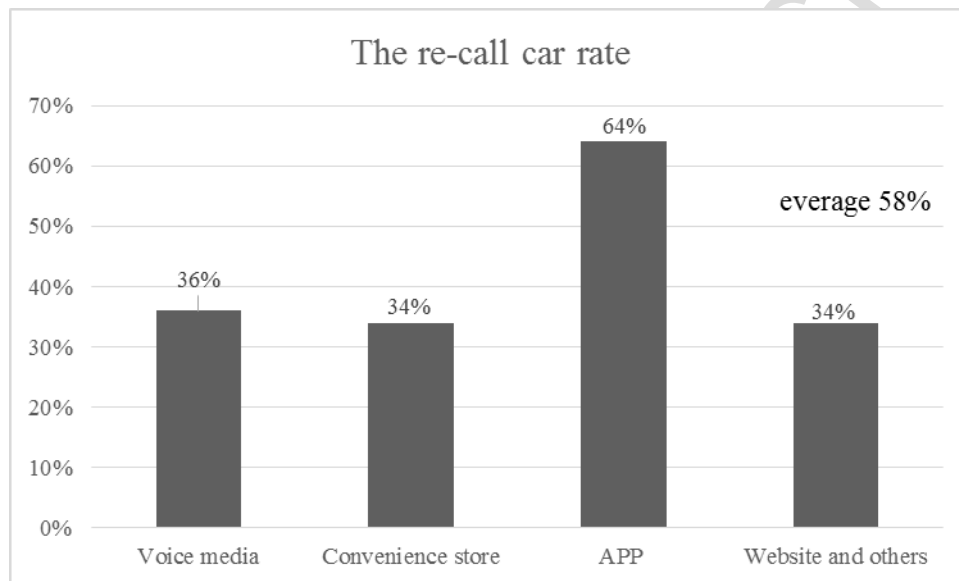


Figure 4. The car recall rate from different channels

In summary, the five propositions are all proved, hence, we could demonstrate the value chain can form a circle to continue working in circulation. The membership of the digital platform can continue to grow and create enough revenue to support the R&D projects to enhance the platform functions. Then the drivers' novel and convenient digital platform can attract and absorb more and more members to use the digital platform to create more valuation to the digital value circle. It can form a positive digital value circulation in the digital platform. The indicators for each dimension are shown in Figure 5, and each indicator can have evidence to prove the propositions and the relationships between the dimensions. Then it can create a value co-creation circle.

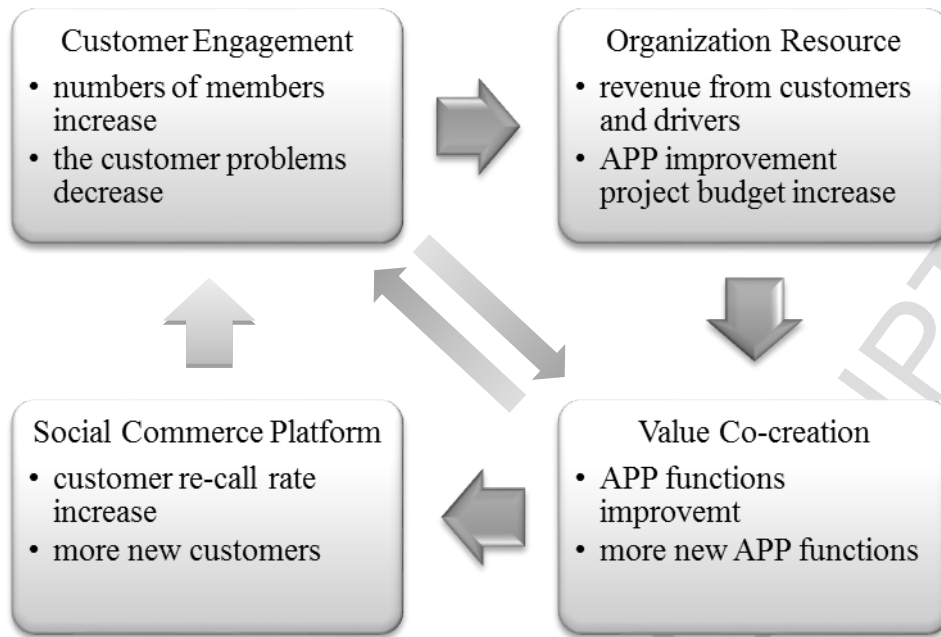


Figure 5: Indicators for each dimension

6. Conclusion

The contributions in this study are two-fold. First, we develop a value co-creation circle that provides a means of how the platform members and firms interact in a social commerce platform to co-create value. Moreover, we illustrate a new perspective of the digital value creation circle, which is different from the value “chain” concept. It can build up a positive value circulation in the social commerce platform by network externality and benefits. Second, we provide the best practice of how to develop a value co-creation circle in a social commerce platform. This value co-creation circle can help firms manage their social commerce platform and boost service innovation, such as the improvement of the platform function and innovative service.

We recommend the following three strategies for being successful with value co-creation in the social commerce context:

(1) Creating network externality by the growth numbers of members.

The critical and most essential condition is that the numbers of members can create the revenue more than the expenditure of the digital platform. The members become the main source of revenue and value creation. It also proves the characteristics and effect of network externality in the digital platform. The value accumulation model suggests that the value of the network will increase rapidly with the increase in the number of members in the network externality, and the increase of value will attract more members to join. It will repeat around

and form a circle. That means consumers in a network whose actions have direct influence on the economic utility of other consumers have network externality on the behaviour of other consumers. Researchers have shown that network externalities exist in organisational technology or innovation adoption (Wang & Seidmann, 1995; Choi & Thum, 1998; Frambach & Schillewaert, 2002; Fabiani, Schivardi, & Trento, 2005). Network externality is also a phenomenon of economies of scale that represents the product utility acquired by the consumer, and then, the utility will rise with the increase numbers of consumers by using the product. Therefore, the network externality of the growth numbers of members can create more value for the co-creation circle in social commerce platforms.

(2) Service innovation through improving the social commerce platform.

As previous studies suggest (e.g., Lee, Hsiao, and Yang, 2010; Yang, Wu, and Wang, 2009), service innovation affects customer perceived value and customer loyalty towards a website. The social commerce platform needs to continue to improve the functions of the platform and provide innovative service to keep members engaged in value co-creation activity. Firms can boost service innovation by improving the functions of the platform. The improved platform functions enable the firm to attract more members.

(3) Value co-creation circle as a revenue generator.

The two key elements in the value co-creation circle - members and platform - are the drivers of value co-creation. The members bring new organisational resources and then the firm can use those resources to improve the service quality of the platform by creating more value-added functions. When the value creation brings more revenue than the cost of the operation of the digital platform, it will form a positive loop of value creation without additional costs.

References

- Allen, D. (1988). New telecommunications services: Network externalities and critical mass. *Telecommunications Policy*, 12(3), 257-271.
- Au, Y. A., & Kauffman, R. J. (2001). Should we wait? Network externalities, compatibility, and electronic billing adoption. *Journal of Management Information Systems*, 18(2), 47-63.
- Baron, S., & Warnaby, G. (2011). Individual customers' use and integration of resources: Empirical findings and organizational implications in the context of value co-creation. *Industrial Marketing Management*, 40(2), 211-218.
- Berghman L., Matthyssens, P., & Vandenbempt, K. (2006). Building competences for

- new customer value creation: An exploratory study. *Industrial Marketing Management*, 35, 961-973.
- Blasco-Arcas, L., Hernandez-Ortega, B. I., & Jimenez-Martinez, J. (2016). Engagement platforms: The role of emotions in fostering customer engagement and brand image in interactive media. *Journal of Service Theory and Practice*, 26(5), 559-589.
- Brynjolfsson, E., & Kemerer, C. F. (1996). Network externalities in microcomputer software: An econometric analysis of the spreadsheet market. *Management Science*, 42(12), 1627-1647.
- Cayla, J., & Arnould, E. J. (2008). A Cultural Approach to Branding in the Global Marketplace. *Journal of Interactive Marketing*, 16(4), 88-114.
- Chathoth, P. K., Ungson, G. R., Harrington, R. J., & Chan, E. S. W. (2016). Co-creation and higher order customer engagement in hospitality and tourism services: A critical review. *International Journal of Contemporary Hospitality Management*, 28(2), 222-245.
- Choi, J. P., & Thum, M. (1998). Market structure and the timing of technology adoption with network externalities. *European Economic Review*, 42(2), 225-244.
- Day, G. S. (1994). The capabilities of market-driven organizations. *Journal of Marketing*, 58(4), 37-52.
- Day, G. S. (2002). Managing the market learning process. *Journal of Business & Industrial Marketing*, 17(4), 240-252.
- Day, G. S. (2003). Creating a superior customer-relating capability. *MIT Sloan Management Review*, 44(3), 77-82.
- Díaz-Chao, A., Sainz-González, J., & Torrent-Sellens, J. (2016). The competitiveness of small network-firm: A practical tool. *Journal of Business Research*, 69, 1769-1774.
- Edvardsson, B., Tronvoll, B., & Gruber, T. (2011). Expanding understanding of service exchange and value co-creation: a social construction approach. *Journal of the Academy of Marketing Science*, 39(2), 327-339.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25-32.
- Fabiani, S., Schivardi, F., & Trento, S. (2005). ICT adoption in Italian manufacturing: firm-level evidence. *Industrial and Corporate Change*, 14(2), 225-249.
- Frambach, R. T., & Schillewaert, N. (2002). Organizational innovation adoption: A multi-level framework of determinants and opportunities for future research. *Journal of Business Research*, 55(2), 163-176.
- Franke, N., & Piller, F. (2004). Value creation by toolkits for user innovation and design: The case of the watch market. *Journal of Product Innovation Management*, 21(6), 401-415.
- Hajli, N., Lin, X., Featherman, M., & Wang, Y. (2014). Social word of mouth: How trust develops in the market. *International Journal of Market Research*, 56(5), pp.673–689.
- Hajli, N., Wang, Y., Tajvidi, M., & Hajli, M. S. (2017). People, Technologies, and

- Organizations Interactions in a Social Commerce Era. *IEEE Transactions on Engineering Management*, 64(4), 594-604.
- Hatch, M. J., & Schultz, M. (2010). Toward a theory of brand co-creation with implications for brand governance. *Journal of Brand Management*, 17(8), 590-604.
- Islam, J. U., & Rahman, Z. (2017). The impact of online brand community characteristics on customer engagement: An application of Stimulus-Organism-Response paradigm. *Telematics and Informatics*, 34(4), 96-109.
- Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, 24(4), 602-611.
- Kim, T., & Shin, D. H. (2016). Social platform innovation of open source hardware in South Korea. *Telematics and Informatics*, 33(1), 217-226.
- Kodama, M. (1999). Customer value creation through community-based information networks. *International Journal of Information Management*, 19, 495-508.
- Lee, J., Lee, J., & Lee, H. (2003). Exploration and exploitation in the presence of network externalities. *Management Science*, 49(4), 553-570.
- Lee, M. S., Hsiao, H. D., & Yang, M. F. (2010). The study of the relationships among experiential marketing, service quality, customer satisfaction and customer loyalty. *International Journal of Organizational Innovation*, 3(2), 352-378.
- Liang, T. P., Ho, Y. T., Li, Y. W., & Turban, E. (2011). What drives social commerce: The role of social support and relationship quality. *International Journal of Electronic Commerce*, 16(2), 69-90.
- Lin, J., Li, L., Yan, Y., & Turel, O. (2018). Understanding Chinese consumer engagement in social commerce: The roles of social support and swift guanxi. *Internet Research*, 28(1), 2-22.
- Lin, K. Y., & Lu, H. P. (2011). Why people use social networking sites: An empirical study integrating network externalities and motivation theory. *Computers in Human Behavior*, 27(3), 1152-1161.
- Liu, Z., Li, M., & Kou, J. (2015). Selling information products: Sale channel selection and versioning strategy with network externality. *International Journal of Production Economics*, 166, 1-10.
- Lusch, R. F., & Vargo, S. L. (2006). Service-dominant logic: reactions, reflections and refinements. *Marketing Theory*, 6(3), 281-288.
- Normann, R. (2001). *Reframing business: When the map changes the landscape*. Chichester, England: Wiley.
- Payne, A. F., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. *Journal of the Academy of Marketing Science*, 36(1), 83-96.
- Payne, A., Storbacka, K., Frow, P., & Know, S. (2009). Co-creating brands: diagnosing and designing the relationship experience. *Journal of Business Research*, 62(3), 379-389.

- Porter, M. E. (1985). Technology and competitive advantage. *Journal of Business Strategy*, 5(3), 60-78.
- Prahalad, C. K., & Ramaswamy, V. (2000). Co-opting customer competence. *Harvard Business Review*, 78(1), 79-90.
- Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing*, 18(3), 5-14.
- Ramaswamy, V., & Ozcan, K. (2016). Brand value co-creation in a digitalized world: An integrative framework and research implications. *International Journal of Research in Marketing*, 33(1), 93-106.
- Roberts, D., Hughes, M., & Kertbo, K. (2014). Exploring consumers' motivations to engage in innovation through co-creation activities. *European Journal of Marketing*, 48(1/2), 147-169.
- Sampson, S. E., & Spring, M. (2012). Customer roles in service supply chains and opportunities for innovation. *Journal of Supply Chain Management*, 48(4), 30-50.
- Sawng, Y. W., Lee, J., & Motohashi, K. (2015). Digital convergence service from the viewpoint of provider and user factors using technology acceptance and diffusion model. *Cluster Computing*, 18(1), 293-308.
- Schau, H. J., Muñiz Jr, A. M., & Arnould, E. J. (2009). How brand community practices create value. *Journal of Marketing*, 73(5), 30-51.
- Sheth, J. N., Sisodia, R. S., & Sharma, A. (2000). The antecedents and consequences of customer-centric marketing. *Journal of the Academy of Marketing Science*, 28(1), 55-66.
- Shy, O. (2001). *The Economics of Network Industries*. Cambridge: Cambridge University Press.
- Stephen, A. T., & Toubia, O. (2010). Deriving value from social commerce networks. *Journal of Marketing Research*, 47(2), 215-228.
- Tajvidi, M., Wang, Y., Hajli, N., & Love, P. E. (In press). Brand value Co-creation in social commerce: The role of interactivity, social support, and relationship quality. *Computers in Human Behavior*.
- Tse, Y. K., Zhang, M., Doherty, B., Chappell, P., & Garnett, P. (2016). Insight from the horsemeat scandal: Exploring the consumers' opinion of tweets toward Tesco. *Industrial Management & Data Systems*, 116(6), 1178-1200.
- Tuominen, M., Rajala, A., & Möller, K. (2004). Market-driving versus market-driven: Divergent roles of market orientation in business relationships. *Industrial Marketing Management*, 33(3), 207-217.
- Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68(1), 1-17.
- Wang, C., & Zhang, P. (2012). The evolution of social commerce: The people, management, technology, and information dimensions. *Communications of the Association for*

- Information Systems*, 31(1), 105-127.
- Wang, E. T. G. and Seidmann, A. (1995). Electronic data interchange: Competitive externalities and strategic implementation policies. *Management Science*, 41(3), 401-418.
- Wang, Y., & Yu, C. (2017). Social interaction-based consumer decision-making model in social commerce: The role of word of mouth and observational learning. *International Journal of Information Management*, 37(3), 179-189.
- Wang, Y., and Hajli, M. (2014). Co-creation in branding through social commerce: The role of social support, relationship quality and privacy concerns. Proceedings of the 20th Americas Conference on Information Systems (AMCIS), Savannah, Georgia, USA.
- Wang, Y., Hsiao, S. H., Yang, Z., & Hajli, N. (2016). The impact of sellers' social influence on the co-creation of innovation with customers and brand awareness in online communities. *Industrial Marketing Management*, 54, 56-70.
- Wang, Y., Kung, L., Wang, W. Y. C., & Cegielski, C. G. (2018). An integrated big data analytics-enabled transformation model: Application to health care. *Information & Management*, 55(1), 64-79.
- Woodruff, R. B. (1997). Customer value: The next source for competitive advantage. *Journal of the Academy of Marketing Science*, 25(2), 139-153.
- Xie, C., Bagozzi, R. P., & Troye, S. V. (2008). Trying to prosume: toward a theory of consumers as co-creators of value. *Journal of the Academy of Marketing Science*, 36(1), 109-122.
- Yang, H. E., Wu, C. C., & Wang, K. C. (2009). An empirical analysis of online game service satisfaction and loyalty. *Expert Systems with Applications*, 36(2), 1816-1825.
- Yin, R. K. (2009). Case Study Research, Design & Methods 4th ed.

Towards Building a Value Co-Creation Circle for Service Innovation in Social Commerce

Highlights:

- A value co-creation circle in service innovation is proposed.
- The operations of service business model have been prototypically implemented.
- We propose a new service innovation business model in the research.