

# Design Thinking for Service Innovation Used Service Experience Engineering Methodology

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## Abstract

The process of innovative decision making in the past largely followed the three steps that Simon proposed in the 1960s had suggested. The purpose of this study used Service Experience Engineering Methodology (SEE) as an example to explore whether or not alternative decision making processes may exist in the open innovation (OI). The value activity in service innovation design (SID) is divided into three categories which are value chain, value shop, and value network. Using a qualitative research approach, we used the SEE Methodology as the SID. This method involves 5 stages, 15 individuals and closely connected sub-models. This method is a process for service innovation design based on design think principles exploring the SID decision process for six illustrations. The value of this research proffered a different, innovative SID process for various industries to consider when they contemplate service innovation on the basis of the SEE Methodology. The decision process in the OI context should be re-thinking. research offers a new conceptual in the different SID process decision making by OI and Simon.

**Keywords:** Decision-making, Service innovation design, Open innovation, Service experience engineering

## 1 Introduction

Design thinking is getting popular as a new way to service innovation. Traditionally, design thinking follows a step-by-step decision process as empathize, define, ideate, prototype, and test. In the Empathize stage, designers need to observe and immersing themselves into the experience of users. Define stage, designers define the topics, problems, or pain points from users' viewpoints based on the information collected in Empathize stage. Then, lots of diverse possible solutions are generated in the Ideate stge. To experience more empathy, a physical form of a prototype is needed to communicate with users in Prototype stage. Finally, to test the prototypes and to refine the original ideas.

Basically, creativity has become a key dimension of the organization that wants to remain competitive [1]. Design thinking was viewed as a series of decision process following the decision making theory that Simon proposed in the 1960s [2]. He attempted to standardize decision-making processes. Subsequent theories were all built on the framework of Simon's theory. They viewed decision-making processes as a step by step process. Through utilizing different analyses, their decision-making processes, including design think processes, were based largely on the three-steps processes; intelligence, design, and decision-making; that Simon proposed in 1997 [3]. They differed only in the approach and the questions from which they attempted to view the decision-making process.

Prior studies of service innovation design (SID) focused on step by step and sequence processes. In the process of innovative SID decision making, while most studies followed the three steps that Simon and Newell [4] had proposed, this study proposes that it is not always true. However, in the OI, service-oriented, the customers' early involvement, collective wisdom, and cluster innovation have all become new challenges facing businesses in their process to make innovative decisions. The SID research subject and its model should be flexible. This study builds an overview of this new perspective on decision making process with OI for SID.

Businesses commonly encounter two types of problems: solving existing problems and finding new demand. The first type is existing problems within an enterprise, such as how product quality can be enhanced or how punctual delivery is achieved. The second appears when in saturated markets, firms identify new customer demand and redefine organizational competitive boundaries, applying innovations to markets as integrators instead of as owners to obtain the rewards of servitization of products from markets, thereby encouraging organizations to attain and create diverse values. This section describes how businesses solve existing problems and discover new demand. Based on six examples, the concept of OI is adopted in this section

for exploring the distinctions of value activities in the SEE Methodology which is a process for service innovation design based on design think principles.

In this research, we first review the literatures in decision making and SID. Then, we review six cases of using SEE methodology in different value activities, such as value chain, value shop, and value network. Using a qualitative research approach, this study explores alternative decision making processes in SID.

## 2 Literature Review

### 2.1 Decision-Making

In the development of decision-making process, the decision theory of Nobel economist Simon [5] is important for management science, school of decision theory focuses on rational decision-making. The school is based on rational decisions and integrated the science of systems theory, behavioral science, operations research, and computer science into one, which became an independent management school in the 1970s. The decision theory school is founded on economic theories, especially consumer choices theory, which suggests that a consumer, on the premise of certain rationality, compares alternative behavior and makes a choice that maximizes the total and marginal utility.

March and Simon [6] defined the “decision makers” as an independent management model that considers organization members are the decision makers who make rational choices in order to reach certain goals. Simon [2] pointed out that one important function of managerial personnel in an organization is to make decisions. The process of decision making that he proffered included three main activities. The first stage is exploration of the environment to seek out conditions that require decision making. The second stage is making, establishing, and analyzing possible action alternatives. The third stage is choosing an alternative for action from among available choices. The best decision makers are rational, i.e., under specific guidelines, a decision maker can only choose the option that offers the maximum value [7-8].

### 2.2 Service Innovation Design Process

Each service innovation design (SID) is in fact a decision-making process. SID is a systematic and repetitive process. It is based on individuals and teams, and it is a cross-disciplinary approach and method to unceasingly learn [9]. It explores how the design and marketing of service may improve customers' experience and the interactive relations between service providers and their customers [10]. This includes methods and tools, and can be applied in many fields, such as marketing, experience design and crossing, and process modeling [11]. It is beneficial for

innovating and improving existing service, increasing service value, and at the same time gaining the same benefits for government, businesses and organizations [12-13]. Walter et al. [14] suggest the firms have to identify, portray and analyze the customer service experiences by listening to the customer voice. In the process of SID, it is necessary to have client participation. The roles of different customer voice to help solve the various issues facing service flow. Johnston and Kong [15] emphasis the firms should help organizations to systematically engineer and actually go about design and improve their customer experiences. Design thinking is understood to be a thought method that leads to change, evolution, innovation, new lifestyles, and new methods of managing businesses [16].

In this study, we select the SEE method as the SID because this method which involves 5 stages (innovation management, demand analysis, service innovation design, service promotion, application to markets) and 15 individuals but closely connected sub-models. And it's provides more tools than the other methods.

The SEE Methodology originated in 2007 when the Innovative DigiTech-Enabled Applications & Services Institute (IDEAS) at the III constructed a series of practices for the process from service innovation to client feedback on the basis of Fraunhofer IAO's service engineering process, which involves 5 stages (innovation management, demand analysis, SID, service promotion, application to markets) and 15 individuals but closely connected sub-models. According to Hsiao and Yang [17] it comprises four phases, namely, FIND (market trend analysis), InnoNet (industrial value net and service modeling), Design Lab (proof of concept and proof of service), and Living Zone (proof of business), as described below:

**FIND.** This stage involves discovering new business opportunities and identifying consumer demand or potential business opportunities. The primary purpose of this stage is to determine the feasibility of new services.

**Innovation net.** This stage involves planning industrial value chains for new services. The purpose is to analyze how enterprises systematically devise value networks for service innovation industries. Service providers must seek suitable partners for satisfying consumer demand.

**Design lab.** Design Lab is the stage of proof-of-service implementation for the new service. The service lab performs premarket preparation to increase the feasibility and acceptance of new services.

**Living zone.** Living Zone stage highlights the practicing proof- of-service for the new service. Develop suitable business models based on the characteristics of services, and present the value of service commercialization and the feasibility of business operation.

### 2.3 Open Innovation

The new ecosystems of global business are all networked and interdependent [18]. Therefore, firms must establish partnership with external forces and integrate internal resources with external resources or innovation to achieve multiline situations. Many firms across industries started to increasingly rely on recommend of external technologies to complement their technology portfolios [19]. Chesbrough [20] believed that enterprises should leverage internal and external knowledge and innovation resources and enrich them with additional values. He defined the OI as a paradigm in which enterprises liberate themselves from closed boundaries, implement planned exploitation and integration of the knowledge and resources flowing in and out of an organization, accelerate internal innovation, and extend the innovation results to the market. In addition, OI is also considered to be a systematical exploration of the internal and external innovation opportunities, integration of business competency and resources, and extensive exploitation of these chances through the exploration of various channels [21]. Enterprise innovation processes are undergoing fundamental changes; therefore, the innovation process must be open for introducing external sources of innovation and effectively exploiting internal sources of innovation. The concept of OI can be divided into two processes, the outside-in and the inside-out [22]. The outside-in process involves the application of external technologies and ideas for enhancing business performance, refer to the ability to gain and explore knowledge from external partners [23]; the inside-out process describes the use of internal, unused innovation or technologies in markets for generating additional benefits [24]. This study outlines the problems on solving existing problems and finding new demand, encountered by enterprises from OI perspective.

### 2.4. Value Activity

The business process model can be divided into three categories: circulation manufacturing, sales service and intermediary trade. The value activities involved in it can be divided into three parts: value chain, value shop and value network.

**Value chain.** Porter's analysis model of value chains is considered as one of the most influential concepts of the 1990s. Porter [25] indicated that value activities such as product design, manufacturing, sales, and after-sales services constitute industrial value chains and create values for customers. A value chain specifies a series of activities performed, from the preparation of materials, production, to delivering the product to customers. The activities are performed sequentially and are mainly adopted to describe the manufacturing sector. The benefits of value chains include cost

reduction, prompt responses, and product or service differentiation. Value chains accentuate differentiation and low cost in the manufacturing sector, focusing on materials.

**Value shop.** Stabell and Fjeldstad [26] extended the structure of Porter's value chains, developing the two concepts of value shop and value network. The value activities of value shop are generally subsumed under the support activities of value chains for solving specific problems, which is the core of value activities. Value shop places emphasis on integrating and customizing information in the service industry and focuses on people.

**Value network.** A value network refers to firms that can be modeled as value networks; it links clients who wish to be interdependent by using mediating technology. Firms in the network mainly provide matchmaking and trading services that are unrestricted by time and space to buyers and sellers; they are not networks themselves, but providers of network services [27]. The values of the Internet reside in buyer-seller investment attraction, contract management, and the maintenance of the service and efficacy of trading platforms. When the number of buyers and sellers involved in a value network increases, the value that such a network generates increases. Value networks emphasize that intermediaries achieve the critical numbers for the externalities among buyers and sellers.

## 3 Research Method

Based on the literature review, this paper hypothesizes that design think processes are different across patterns of value activities and open innovation approaches. Specifically, we designed a 2 (solving existing problem, finding new demand) \* 3 (value chain, value shop, and value network) framework. From industry points of view, value chain is for manufacturing. Value shop is for the service industry, and value network is for industries providing intermediary platforms. It outlines the problems encountered by enterprises from OI perspective (outside-in, inside-out). Businesses commonly encounter two types of problems: solving existing problems and finding new demand. The first type is existing problems within an enterprise. The second appears when in saturated markets, firms identify new customer demand and redefine organizational competitive boundaries, applying innovations to markets as integrators instead of as owners to obtain the rewards of servitization of products from markets, thereby encouraging organizations to attain and create diverse values. The qualitative investigation of a specific operational process presents the opportunity to take a more grounded approach [28-30]. SEE methodology is a relatively new theoretical field, which is more suitable of using exploratory, qualitative, and case-analysis-based approaches for research [31].

To explore how the design thinking processes differ across these six cases to investigate the different processes in SEE Methodology are based on the concept of OI.

Businesses commonly encounter two types of problems: solving existing problems and finding new demand. The first type is existing problems within an enterprise, such as how product quality can be enhanced or how punctual delivery is achieved. The second appears when in saturated markets, firms identify new customer demand and redefine organizational competitive boundaries, applying innovations to markets as integrators instead of as owners to obtain the rewards of servitization of products from markets, thereby encouraging organizations to attain and create diverse values. This section describes how businesses solve existing problems and discover new demand. Based on six examples, the concept of OI is adopted in this section for exploring the distinctions of value activities in the SEE Methodology.

### 3.1 CASE 1: Foxconn As a Value Chain Solving Existing Problems

Foxconn changed its service procedures under the influence of Apple Inc. (power-user driven). It is a value chain solving giving problems from buyers. Foxconn manufactured the glass edges between the front glass panels of the iPhone 4 by metal cutting, but this processing method left seams and traces of stamping on phone cases. To satisfy Apple's requirements, Foxconn sought external resources and purchased 10,000 slicing computerized numerical control machines from FANUC Ltd in Japan, using the machines for mass production.

Because value chain involves every level and cross-organization in an industry during problem-solving processes, it is mostly activated by key firms in an industry chain. Businesses coordinate with key firms to design internal service procedures, identify customer demand, search for partner companies for new services based on the core competency of the firm, integrate resources from outside-in, and finally verify the feasibility of new business models. The corresponding process in the SEE Methodology is the following: Design Lab → FIND → InnoNet → Living Zone.

### 3.2 CASE 2: Hua Sheng As a Value Chain Finding New Demand

Sometime a value chain is designed to explore new opportunity. Hua Sheng Aquatic Products Processing Factory in Zhejiang Province, China. The allowed amount of silver-stripe round herring that can be fished in China totals several hundred thousand tons annually. Because of preservation difficulties, silver-stripe round herring is considered valueless by fishermen. However, they discovered that Japanese enjoy consuming silver-

stripe round herring and regard it as an ideal calcium supplement. Therefore, invited a group of aquatic-product processing experts and shipwrights to build a fishing vessel. In other words, they "moved" the processing factory directly to the vessel, named Hua Shen Fishing Plus One, which enabled simultaneous fishing and processing. This vessel is not only the first factory ship (in which facilities are available for processing dried aquatic products) in China, but also the largest mobile processing ship sailing at sea in the Asia-Pacific region. Fish could be dehydrated in half an hour, and profits soared 20-fold. This method maintained product freshness and relatively reduced the fishing intensity required for catching major economic fish. Subsequently, fishing resources were reasonably conserved, prompting the sustainable development of fishery industries. As the largest aquatic-product processing vessel in Asia, this factory ship transformed fishing business models, establishing a path for fishermen to create wealth. The fishers can immediately sell their catch to Hua Sheng for instant processing and receive cash payment on site. This process eliminated the need to transport the catch ashore, as well as extended fishing times and reduced transportation costs. Currently, dried silver-stripe round herring has successfully entered high-end markets in Europe and North America and has gained tremendous popularity in Japan.

Businesses in the manufacturing sector typically create new services and obtain potential advantages through technological competence [32]. In a value chain, firms discover new customer demands through material demands, production trends, or cross-organizational data. Internally, they develop new service models; externally, they introduce them into markets, altering the entire business ecosystem and creating new business models. The corresponding process in the SEE Methodology is FIND → InnoNet → Design Lab → Living Zone.

### 3.3 CASE 3: Kaiser As a Value Shop Solving Existing Problems

A value shop often starts from finding customers' needs. The large-scale managed care consortium, Kaiser Permanente [33], found that their shift operating system hindered nurses from providing patients with consistently high quality care because nurses spent the first 45 minutes of their shifts at nursing stations briefing colleagues regarding patients' conditions. However, methods of exchanging patient data varied, ranging from dictation, voice recordings, to face-to-face conversations. In addition, the methods of compiling patient data varied as well. For example, some nurses scribbled notes on paper, and some even wrote on their clothes. Although much time was spent, nurses remain ignorant of the essential information pertaining to their patients. To solve this problem,

Kaiser Permanente cooperated with IDEO, an innovation consultancy institute, to establish a task force that included a strategist (who used to be a nurse), an organizational development expert, a technologist, a process designer, a union representative, and several IDEO designers. For shift work, they designed a new service procedure that included new operating procedures and simple software systems for nurses to enter patient information during their shifts. The results indicated that the time between the start of shifts to actual interactions with patients was reduced by more than half. In addition to the quality of medical experiences, the satisfaction and productivity levels of hospitals were also improved. The medical group further discovered new demands based on the new service procedure. Currently, every Kaiser Permanente hospital has adopted the electronic medical record program, incorporating patient information into their electronic systems.

For solving existing problems within firms, the value shop concept focuses on customer involvement and the acquisition of customer information. In this process, by focusing on people, firms realize customer demands and integrate external customer demands with internal resources. The design thinking of empathy becomes the focus of the proof-of-service model. New services then undergo the proof-of-business process for firms to observe customer feedback on new service procedures, from which novel customer demand is determined and the entire process is repeated. Consequently, the corresponding process in the SEE Methodology is a cyclic one: FIND → InnoNet → Design Lab → Living Zone → FIND.

### 3.4 CASE 4: Bank of America As a Value Shop Finding New Demand

The core of design thinking is to observe living zone first. That is, try to find new demands by observation. Bank of America [33] established a cooperative innovation team with IDEO to observe customer behavior. The team discovered that consumers habitually place small change into a jar after shopping. Once the jars are full, consumers deposit the money in the bank. Based on this habit, Bank of America implemented an innovative measure that encouraged customers to open debit card accounts. When making a payment by using debit cards, the total is rounded up, but the difference is deposited into their accounts; this enables customers to simultaneously pay for their purchases and add to their savings accounts. Based on this customer behavior, the Bank of America designed the Keep the Change Savings Program, creating a natural purchasing experience for consumers. In addition, to attract the customers to use this service, Bank of America contributed an equal amount to customers' savings accounts during the first 3 months. After this initial period, they contributed 5% of a

customer's savings amount (up to a maximum of US\$250). However, what customers actually gain is emotional rewards because they typically feel satisfied for having saved money without much effort. This new service attracted 2.5 million customers within 1 year, generating 700 thousand new checking accounts and 1 million new savings accounts. More than 5 million people participated in this new service, yielding total savings of more than US\$500 million.

The value shop concept encourages businesses to directly observe customer behavior in actual scenes to discover new customer demand, integrate external customer demands with internal resources to design new service procedures, directly observe customer behavior in actual scenes again, and repeat the entire process. Therefore, the corresponding process in the SEE Methodology is the following: Living Zone → FIND → InnoNet → Design Lab → Living Zone

### 3.5 CASE 5: Fab.com As a Value Network Solving Existing Problems

The value net as a platform often start from solving problems for buyers and suppliers. The U.S. flash sale Web site Fab.com (<http://fab.com/>) was derived from Fabulis, a social network for homosexual men that contains one hundred and fifty thousand members. The Fabulis network transformed into a company that provided services such as localized business recommendations and group buying for gay men, but the business performed poorly. Therefore, the operating team closed the Web site to determine the core value of the business. They discovered that the key to transformation was design and to employ a strategy of limited-time sales to attract buyers. The founders used their unique personal tastes to curate products; they cooperated with designers, visited and explored producers of stylish products worldwide, and sold the commodities online. The unique aspect of Fab.com is that the website's selection of merchandise is on the aesthetics, color, and style of the products.

Regarding solving businesses' existing problems by applying the value network concept, because services provided by other followers or competitors pose little difference to consumers, businesses must discern potential market demand through social interactions. Subsequently, businesses must establish an innovative business model through the integration of various internal and external internet resources; develop new markets based on platform rules; and conduct proof-of-business through prototypes under the guide of a platform. The corresponding process in the SEE Methodology is the following: FIND → Design Lab → InnoNet → Living Zone.

### 3.6 CASE 6: Pinkoi As a Value Network Finding New Demand

A value network is a place that buyers and suppliers

meet. The participation from both sides often creates new opportunity and finds new demand. Pinkoi (<http://www.pinkoi.com>) is a shopping Web site for artisanal products. Peter Yen, the founder of Pinkoi, discovered that numerous products in U.S. design shops were designed and manufactured in Taiwan, but not sold in Taiwan. Additionally, Yen found that although Taiwan has high rates for winning the iF International Forum Design Award (Germany), Red Dot Design Award (Germany), and Good Design Award (Japan), many outstanding designers in Taiwan are unable to release their products because of capital and resource restrictions. However, Yen discovered that the market was lacking an exclusive platform for locally-designed products. In addition to helping designers sell their products, Pinkoi mainly aimed to assist designers with conveying design ideals and brand stories. He designed an easy-to-use release system (e.g., Google’s word prediction or data records memory) on the platform through internal development technologies to satisfy designers’ needs. After the establishment of the platform, Pinkoi must convince users and consumers that its featured designers are generally rigorously assessed in order to provide

consumers with high quality products. For designers, Pinkoi must persuade them that they offer comprehensive tools that would assist them in eliminating distribution and agency fees; this would enable designers to concentrate on their products without being exploited.

In a value network, a new venture wishing to develop new services in an industry typically obtains market information through social interactions to ascertain customers’ unsatisfied or undiscovered demands. The company then assesses if internal resources can be well-integrated with external environments for establishing a platform environment that is both satisfactory and sound. Through the characteristics of such a platform, the company actively builds a brand new cooperative rule to attract buyer and seller costumers, and eventually conducts various proof-of-business processes through prototypes. The corresponding process in the SEE Methodology is following: FIND → InnoNet → Design Lab → Living Zone. Base on OI and value activities, we used SEE method to explain the relationships about six cases. Summary is shown in Table 1.

**Table 1.** SEE method to explain the relationships about six cases

	OI		
Value activity		Outside-in	Inside-out
Value Chain	<p><b>CASE 1: Foxconn As a value chain solving existing problems</b></p> <p>The corresponding process in the SEE Methodology is the following: Design Lab (this processing method left seams and traces of stamping on phone cases) &gt; FIND (satisfy Apple’s requirements) &gt; InnoNet (purchased 10,000 slicing computerized numerical control machines from FANUC Ltd in Japan) &gt; Living Zone (using the machines for mass production).</p>	<p><b>CASE 2: Hua Sheng As a value chain finding new demand</b></p> <p>The corresponding process in the SEE Methodology is FIND (discovered that Japanese enjoy consuming silver-stripe round herring and regard it as an ideal calcium supplement) &gt; InnoNet (invited a group of aquatic-product processing experts and shipwrights to build a fishing vessel) &gt; Design Lab (moved the processing factory directly to the vessel, which enabled simultaneous fishing and processing) &gt; Living Zone (fishing resources were reasonably conserved, prompting the sustainable development of fishery industries)</p>	
	<p><b>CASE 3: Kaiser As a value shop solving existing problems</b></p> <p>The corresponding process in the SEE Methodology is a cyclic one: FIND (found their shift operating system hindered nurses from providing patients with consistently high quality care) &gt; InnoNet (cooperated with IDEO, an innovation consultancy institute) &gt; Design Lab (they designed a new service procedure) &gt; Living Zone (the time between the start of shifts to actual interactions with patients was reduced by more than half) &gt; FIND (the medical group further discovered new demands based on the new service procedure)</p>	<p><b>CASE 4: Bank of America As a value shop finding new demand</b></p> <p>Living Zone (the core of design thinking is to observe living zone first) &gt; FIND (discovered that consumers habitually place small change into a jar after shopping) &gt; InnoNet &gt; Design Lab (designed the Keep the Change Savings Program, creating a natural purchasing experience for consumers.) &gt; Living Zone (customers actually gain is emotional rewards because they typically feel satisfied for having saved money without much effort.)</p>	

**Table 1.** (continue)

Value Activity \ OI	Outside-in	Inside-out
Value Network	<p><b>CASE 5: Fab.com As a value network solving existing problems</b>                      The corresponding process in the SEE Methodology is the following: FIND (discovered that the key to transformation was design) &gt; Design Lab (focus on design-related commodities and to employ a strategy of limited-time sales to attract buyers) &gt; InnoNet (they cooperated with designers) &gt; Living Zone ( visited and explored producers of stylish products worldwide, and sold the commodities online)</p>	<p><b>CASE 6: Pinkoi As a value network finding new demand</b>                      The corresponding process in the SEE Methodology is following: FIND (discovered that numerous products in U.S. design shops were designed and manufactured in Taiwan, but not sold in Taiwan and the market was lacking an exclusive platform for locally-designed products)&gt; InnoNet (Yen and his business partners visited designers who were interested in cooperating with them.) &gt; Design Lab (designed an easy-to-use release system) &gt; Living Zone (to provide consumers with high quality products and enable designers to concentrate on their products without being exploited).</p>

### 4 Results

In this study, we investigated the employment of three types of value activities, namely, value chain, value shop, and value network, in the SEE Methodology. The results indicated that although distinctions exist because of different value activities, the SEE Methodology can be adopted by various industries. Therefore, we integrated the outside-in and inside-out types of OI with the SEE Methodology and compiled the results in Table 2. Solving existing problems and finding new opportunities in a value chain are a chain-like process in the SEE Methodology.

Solving the existing problems of businesses is typically driven by the key firms in an industry chain. This corresponds with the Design Lab phase in the SEE Methodology, which specifies innovating internal business service procedures and reforming business operating models by using external resources. Finding new demand is primarily achieved by discovering new customer demand through internal information or upstream and downstream firms in a value chain. This activity begins from the FIND phase in the SEE Methodology, transforms service models from the inside, and promotes them outside to markets, thereby changing the entire business ecosystem and creating new business models.

**Table 2.** Investigation of the distinctions in the SEE methodology through OI

Value Activity \ OI	Focus	Outside-in (solving existing problems)	Inside-out (finding new demand)
Value Chain (driven by core competency)	Solving existing problems and finding new opportunities in a value chain are a chain-like process in the SEE Methodology.	Solving problems existing within firms is typically driven by key firms in an industry chain (the Design Lab phase) to transform the firm’s operating models.	Finding new demand is achieved mainly by determining new customer demand (the FIND step) through internal information.
Value Shop (driven by customer demands)	Solving existing problems and identifying new opportunities are both cyclic processes in the SEE Methodology.	To solve the existing problems, firms should emphasize customer involvement and the acquisition of customer data, by which they discern customer demand (the FIND phase).	The value shop involves directly observing customer behavior in actual scenes (Living Zone) to discover new customer demands.
Value Network (driven by social interactions)	Solving the existing problems of businesses and finding new demands both depart from identifying customer demand (the FIND phase) and are modeled as a network. Because of different levels of business maturity.	The process of solving existing problems is led by platforms (the Design Lab phase).	Regarding finding new demand, internal and external resource assessment must first be conducted (InnoNet phase).

In value shop, consumer feedback is a key factor. Although solving existing problems and finding new opportunities are both cyclic processes in the SEE Methodology, they differ at the starting point. The key points of solving existing problems include customer involvement and the acquisition of customer data, by which businesses discern customer demand, start from the corresponding FIND step in the SEE Methodology, and improve their internal service procedures. Finding new demands involves directly observing customer behavior to discover new customer demands. The corresponding step in the SEE Methodology is Living Zone. Businesses performing this activity then develop new service rules, promote new services to markets, create new service demands, and repeat the cycle.

In value network, both solving businesses' existing problems and finding new demands are performed based on customer demands (the FIND phase). Their corresponding processes in the SEE Methodology are both modeled as a network. Different levels of business maturity result in distinct measures. In solving existing problems, most firms solve the problem of internal and external resource integration according to the operating model of their platforms (the Design Lab phase); however, for new ventures or business service innovation, the integration of internal and external networks must first be achieved (the InnoNet phase), and the limitations of internal resources and external environments are then considered for generating a new platform operating model.

## 5 Conclusion and Future

Innovation decision-making processes of the past largely followed the three steps of Simon [2], the father of decision making. But in an open, innovative networked era, early involvement of customers, the collective wisdom of web denizens, and cluster innovation in the eco system are all new challenges in the innovation decision making processes of businesses. This research found that in OI, businesses must take in outside help and establish collaboration relations. Combining external resources or innovation with internal resources, businesses and other parties involved may reach a state where all parties concerned benefit from the relation. In OI, this research offers a new thought in innovation SID decision-making process that is different from that offered by Simon. Therefore, Simon's three-step decision-making process needs to be reconsidered.

According to the result of this study: First, the processes of service innovation design are contingent to type of value activities. We discovered that while undertaking different value activity, businesses emphasized a core value that varied when the service value was changed. Therefore, this study believed that the SID flow should be flexible, adjusting to the varied circumstances that businesses would be facing. Second,

this study was built on the framework of the SEE Methodology. It tried to propose a SID process to improve the SID flow and different flows for different service innovation decision making to prove that in an OI networked era, a SID flow, instead of being a step by step and sequence processes, is flexible. Third, this research explored the decision-making processes in OI. It summed up customized SEE Methodology and gave specific references to the value chain in the manufacturing industry, value shop to the service industry, and value network in the industries providing intermediary platforms. In summary, every company's business model involves these three types of value activities. Each business should rethink their SID because the circumstances facing each new service are different. One SID cannot be used for all cases. Value activities vary by industry, so the derived services are different. Different SIDs are developed according to different value activities. The findings of this research can be used as a feedback to businesses' SID decision-making flows.

Qualitative results generally encompass the subjective perceptions of the researcher of a study. The six examples in this study are based on secondary data. Through qualitative analyses, this study explored decision-making processes in an OI environment and summed up customized SEE Methodology and gave specific references to the value chain in the manufacturing industry, value shop to the service industry, and value network in the industries providing intermediary platforms. Future research may consider adding different roles that businesses play, such as factors led by core businesses or led by social groups, to explore SID decision-making flows. Alternatively, future research may zero in on a single industry to perform in-depth exploration and assessment, or it may focus on making improvements to the SID flows of this research to explore the differences between traditional decision-making processes and those in an open, innovative, and networked environment.

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