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An Analysis of Infrastructure Innovation in Corporate Collaboration

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Abstract--**In a service economy, companies need to provide their customers with both goods and services that create value for customers and make sure of corporate success. A promising approach to creating customer value is innovation of infrastructure, i.e., make constructive changes to the business platform. One way to achieve infrastructure innovation is through collaboration with companies in different industries, which leads to improvements in the organizational knowledge creation process. However, there have been few studies on corporate collaboration in terms of infrastructure changes. There is a need to identify the mechanism of infrastructure change and its relationship with innovation. This study aims to create a model based on the analyzing of infrastructure innovation, which make continuous connection with users by providing fun and opportunity for satisfying self-determination. To achieve this goal, we conduct two case studies about successful corporate collaborations; Nike-Apple and Nissan-Renault Company. Our model will contribute to create business strategies for cultivating a new market.**

I. INTRODUCTION

The world is becoming more service oriented, and the growing importance of services is one of the key trends witnessed in recent years [1]. Manufacturing and service organizations offering only goods or services are finding it increasingly difficult to remain competitive. Companies need to move up the value chain and compete on the basis of value delivered [2] by providing 'fuller market packages' or 'bundles of customer-focused combinations of goods, services, support, self-service, and knowledge' [3]. Although most manufacturers provide services as well as goods, they generally do so as a way to enhance the value of their products rather than as a component of their competitive strategy. Companies are thus increasingly offering 'value packages' (packages of services and goods) to their customers. However, the question is arises about the sustainability of values as services on core offering is creating value but its sustainability as well as ensure value forever for recipients (that we can articulate as 'value-in-keep' [4]) is difficult.

Research on 'service value sustainability' is a key to corporate success. 'Service' is the application of competence by one entity to the benefit of another [5]. From this declaration, individuals can obtain a clear perspective of trade and industry phenomena, by engage of value, more clearly service activities require value co-creation between exchanging all parties and a win-win relationship between service providers and recipients that is based on receiving mutually beneficial values [6, 7]. Finding ways to sustain service value so that all parties (provider, recipient, and other parties) remain satisfied is a big challenge for any organization.

There have been studies on service sustainability [4], environmental sustainability [8, 9], ecological footprint [10], and corporate strategy [11], but there have been none on infrastructure innovation based on corporate collaboration meant for value-in-keep.

In the study reported here, we analyzed the insight of corporate integration, which works as a unique method of infrastructure change and makes business platform for creating organizational knowledge as well as continuous customers' time demand values. We also extended the concept of value-in-keep [5] by modeling the infrastructure innovation that resulted from collaboration among organizations.

In this report, we first survey service sustainability practices in the manufacturing field. We then describe the original value-in-keep concept, the value co-creation concept, and the model we developed. Next we present case studies that demonstrate the usefulness of the model. We conclude with a summary of the key points.

II. SERVICE SUSTAINABILITY PRACTICES IN MANUFACTURING FIELD

The service is a permeating element for a firm to compete in global market. More and more companies are transforming their image, from that of a company offering a typical product or service to one of a company offering total solutions aimed at meeting the customer's expectations and ensuring value co-creation. This trend is mirrored in the shift seen in the economies of developed economies, where companies are focusing more on delivering value than on delivering goods by shifting their focus from manufacturing to product–service oriented systems [12, 13].

Service activities within the manufacturing industry (i.e., servitization) have become a key to gaining a competitive advantage. Customers are now demanding a value-creation process (e.g., transportation) rather than the product itself (a vehicle). This is leading to an increase in the volume of provided services as well as to a broader range of services purchased by a customer [14]. Oliva and Kallenberg [15] analyzed this transition, in which a manufacturing firm transitions from viewing the services it provides as simply add-ons to its physical goods to viewing goods as add-ons to their core services. In other words, the typical organization is moving towards customer centricity from physical-goods centricity, it is offering tailored, integrated solutions rather than homogenous products [16]. For example, IBM, the world's leading computer and technology firm, was established in 1911 and, until 1990, basically offered computer products and computer maintenance services. Then, around 1990, IBM came to realize that, to maintain its leading position in the global marketplace then it would have to offer a full range of total solutions to its customers (including technical support, training, know-how, knowledge, and solutions). It thus transformed itself into a company focused on designing and delivering customer centric value. In short, the manufacturing industry is currently moving towards offering a package of services and goods, as a 'value package' [17].

III. EXTENSION OF VALUE-IN-KEEP CONCEPT

A. *Original value-in-keep concept*

The concept of 'value-in-keep' was introduced by Shirahada and Fisk in 2011 [4]. They introduced it as a new concept to consider in tripartite value co-creation to sustain service. Our aim was to extend this concept to make it more precise, starting from the viewpoint of service-dominant (S-D) [5] logic. The basic idea of S-D logic is that the consumer is a co-producer of the service to be provided and should thus be an active participant in the development process. While S-D logic is important from the viewpoint of the traditional marketing impression, it is not far from the service marketing concept, which means "to be responsive to customers and their many needs" [4]. There is a fundamental similarity between S-D logic and the traditional service marketing concept in terms of process, exchange, interaction, participants, and satisfaction as value. In 2008 [6] encompassing this individualities as 'value of service' such as 'value in context', 'value in use' and 'value in exchange' thus it is also signifying as a process of value co-creation that hunt for progress conjoint values.

It is clear that service providers are working to translate the customer centric vision on the basis of S-D logic. Their efforts are expanding the market by supporting consumers during knowledge and value creation. However, service providers also have to think not only about service value creation but also about keeping the value forever, which is a major challenge for any organization. To maintain value in the long term, it is essential for all parties to share their knowledge, skills, technologies, and other resources because doing so can improve their abilities to generate mutual value through beneficial relationships. Therefore, to promote the concept of service value sustainability, the service providers must collaborate with other participants including customers and maintain lasting connections aimed at creating, expanding, and offering not only their common values but also to maintain these values.

Thus, the 'value-in-keep', which is composed with maintenance, preservation and conservation for ensuring continuous values through building long-term bridge among firms and other objects related to any given exchange.

B. *Value co-creation process*

Acquiring market share and maintaining it has become even more difficult in today's global economy, so the main goal of most companies has become to create and offer value. The concept of value co-creation was explored by Vargo and Lusch [5], who argued that the roles of producer and consumer are not distinct. That is, value is created mutually and reciprocally through the interactions of providers and beneficiaries through integration of their resources and application of their competencies [6]. Customers and providers are engaged in dialog [18] and sharing experience at every point during service or product design. This collaborative effort to improve the service or product helps the provider to better satisfy the customer's needs and wants. Therefore, in the value co-creation process, customers and other operating partners are valuable resources, functioning as co-producers [19] of the service or product. This means that providers must remain connected with their collaborative partners, including customers, in order to continuously create value. Thus, the provider and user co-create common value, resulting in such products as the 'Nike + iPod Sport Kit,' 'Heat-Tech clothing,' and Boeing's 787 Dreamliner.

C. *Model of infrastructure innovation through collaboration*

To generate and provide value packages to its customers, a company needs to make ready itself or needs to make constant value producing platform by innovating its infrastructure that will secure market shares and acquire customers as well as retain them. However, this infrastructure innovation process is a massive undertaking for a company that was designed to offer only goods or services that create value but now wishes to offer a complete value package that will continue to provide value over the long term. The company must adopt a new way of thinking and realize that a lack of the resources needed can be overcome through collaboration with another company and customers. A company can thereby achieve infrastructure innovation and attain a knowledge creation process.

As illustrated in Fig. 1, an organization lacking the resources needed to produce a product or service ('Organization-A') and for that it needs to identify a suitable business partner ('Organization-B') [20], a partner that can provide the resources (information, advanced technology, financing, etc.) needed to produce the right solution. For example, Organization-A could collaborate with Technology-based Vision Company or Knowledge-based Vision Company or Customer-based Vision Company.

Technology-based Vision Company

Technology performs an important role in organizational sustainability as well as in keeping the company on the business growth path. The core power of technology-based firms comes from their co-evolution with advanced science and technology. A technology-based company is very often employ in technology adjustment and technology related partnering [21] aim to increase the company's capabilities and it is the requirement of value centralization, value sharing-serving and increase customer connectivity.

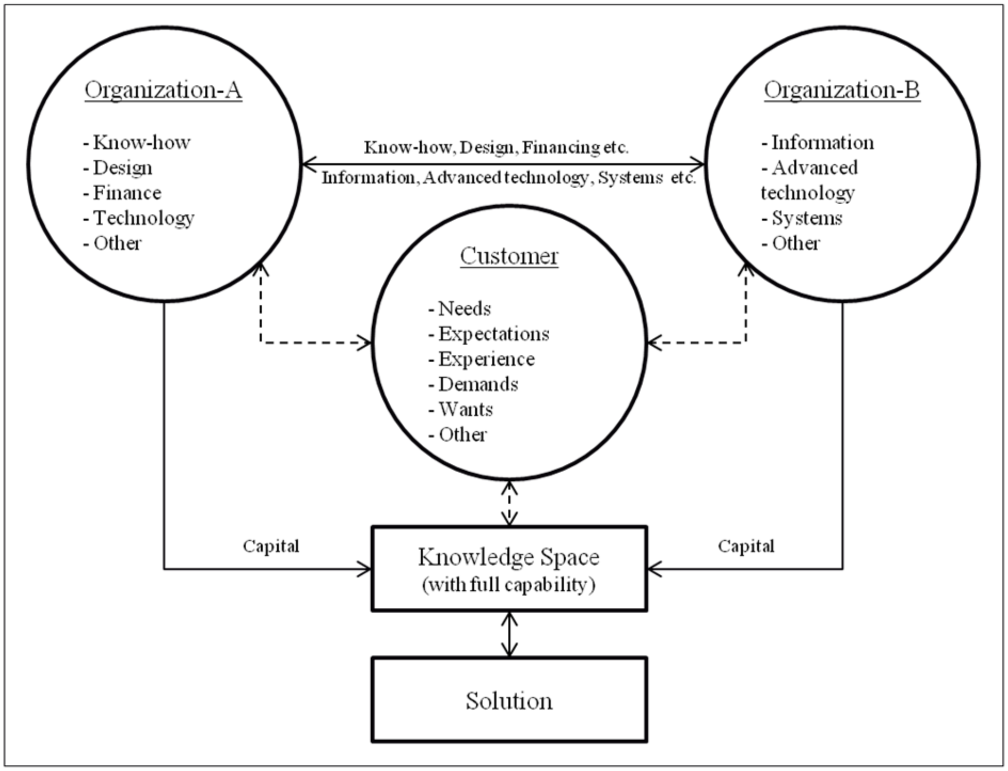

Fig. 1 Model of infrastructure innovation through collaboration.

Therefore, technology can make an organization more effective and efficient in creating the solutions required by the market, but the success of business generation depends on the ability of the company to use it effectively and customer approachability.

Knowledge-based Vision Company

Knowledge creation and its application to value co-creation with a view to achieving competitive advantages is one of the main goals of a company. Knowledge is the most strategically significant resource of a firm [22], and "knowledge-bases and capabilities among firms are the main determinants of sustained competitive advantages and superior corporate performance" [23]. Over the last two or three decades, many companies and even some manufacturers, namely IBM, General Electric, Rolls Royce, and Siemens, have shifted to an emphasis on knowledge to ensure that their business is conducted from a knowledge perspective. In accordance with knowledge transfer and knowledge-based value creation, not only do their employees and organizational structure play a major role, but their customers to encourage the development of competencies based on their experience, demands, and expectations. Thus, the customers are considered to be a part of the knowledge-based vision of a company.

Customer-based Vision Company

Customer satisfaction is a fundamental mission [24] of almost every company, and achieving that mission is difficult for a company that does not deliver superior value. Therefore, companies are working to obtain a sustainable competitive advantage by providing value to customers; i.e., they are shifting their philosophy to 'customer centric' from 'product centric'. Hammer stated in 1996 [25] that "A process perspective on a business is the customer's perspective…A perspective requires that we start with customer and what they want from us, and work backward from there". The customer is thus a company's most significant resource as a co-producer or co-developer of value, knowledge, imperfect information, [26, 27] and competencies. Hence, recognizing and studying about customer and honoring their required values are necessary for building a corporate culture based on customer value.

In the example shown in Fig. 1, Organization-A integrates with Organization-B to strengthen its ability to expand its share of the market as well as to enrich with the power of full-filling market demands. This process also creates an unbroken relationship with user through which a service provider or manufacturer can collect update experience, knowledge, needs, and demands of market, as a result this trio collaboration truly create reciprocated value without interval that is signifying the meaning of value-in-keep.

IV. CASE STUDIES

The model we developed of infrastructure innovation resulting from collaboration between two organizations is based on our analysis namely: Nike–Apple and Nissan–Renault.

A. Nike–Apple alliance

This first case illustrates how a company can move to a value-in-keep viewing platform in order to gain competitive advantages and how customer value can be created by effectively allocating the competencies of two companies.

Company Overview

Nike Inc. was established in 1964 at the University of Oregon. It is a world leading sportswear and fashion wear manufacturing company; it launched its own product line, known simply as 'Nike,' in 1971. Nike has been a prestigious brand worldwide since about 1990. It has always promised to meet the expectations of all types of athletes and now it is also eager to promote its image as a value provider rather than simply a typical product provider. 'Nike plus' is publicized as the world's largest running club, where all members can connect with Nike to obtain better value. Nike currently operates in over 160 countries worldwide as the largest sportswear and fashion wear manufacturer and supplier.

Apple Inc. is a U.S.-based multinational company that provides consumer electronics, computer software, and commercial servers. Founded in April 1976 by Steve Jobs and Steve Wozniak, it quickly became well known for its electronic innovations. Apple became a high-value innovative company through the outstanding leadership of Steve Jobs. As CEO, he acted as a 'special customer,' reflecting the true demands of the market. He created a new corporate philosophy of producing simple, easily recognizable products that created and delivered true value to the customer. Apple has thus become the largest technology-based firm in the world.

Outline of Alliance

In May of 2006, Apple's CEO, Steve Jobs, and Nike's CEO, Mike Parker, announced a partnership between their two organizations as shown in Fig. 2. This 'Nike+ iPod' business alliance aimed to launch innovative products under the slogan "Tune your run". Steve Jobs stated that Apple had decided to work with Nike "in order to elevate together music and sport to a new level of performance". Mike Parker stated that "Nike + iPod resulted from forming a partnership between two global brands that had a mutual passion", i.e., the creation of products or services that enable the user to enjoy new experiences full of innovation and design, as well as an effective change in the way people perceive and do sport. Thus, this collaboration's main goal was to co-create true value that would satisfy stakeholders [28] as well provide win-win benefits for all participants [29].

Market data indicated that a differentiation from typical running shoes was needed to attract customers. To meet this need, Nike and Apple connected music with physical exercise by sharing their competencies and strengths. Apple provided know-how and experience regarding electronic equipment, music players, and digital music, and Nike provided advanced technology and running shoe designs. The special customers in this partnership were Steve Jobs and Mike Parker who shared their experiences, needs, and knowledge.

This combination of knowledge and technology resulted in the emergence of the 'Nike + iPod Sport Kit', a novel solution that satisfies customers and co-creates user value [30]. This sports kit contains a wireless sensor for attachment to a running shoe and a receiver for connection with an iPod nano player. The sensor, which works only with Nike+ shoes, communicates with the receiver, and this system provides real-time feedback about the individual's performance during training. Users can select their form of exercise from a personal training list. The automatic sensor is flexible, providing information about foot movement, rhythm, time, calories burned, and distance covered.

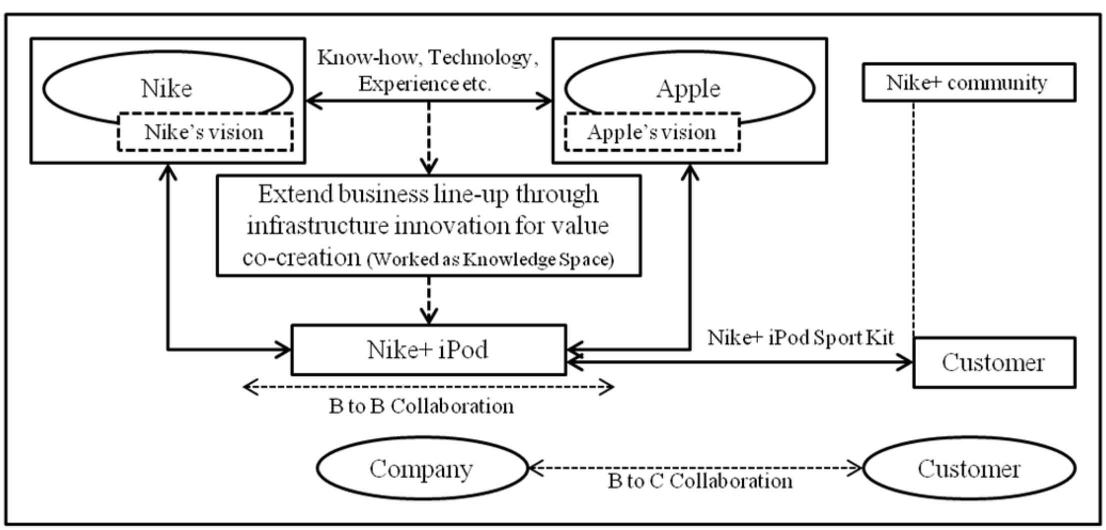

Fig. 2 Corporate collaboration of Nike-Apple for infrastructure innovation

This solution also seamlessly connects users through the 'Nike+ community'. A Nike+ customer usually becomes a member of the global 'Nike+ community' as doing so is a good way to receive feedback on their activities individually or together with other members in any part of the world. Thus, the Nike + iPod Sport Kit is a basis for sharing, creating, and maintaining value according to market request.

Infrastructure Innovation

This case clearly shows that Nike's infrastructure was based mainly on technology, financing, and ergonomic design, which was insufficient for meeting current market demands. Nike recognized that it lacked the resources and infrastructure needed for delivering expected value to customers. Therefore, it entered into an agreement with Apple for innovating or getting enriches its infrastructure that would be able to producing true value for market. Apple then provided the know-how and experience it had obtained as a manufacturer and supplier of electronic equipment, music players, and digital music. This addition of Apple's know-how and experience to Nike's resources resulted in the creation of a 'knowledge space' [31], which led to the innovation of the infrastructure needed by Nike.

Value-in-Keep

In this way, Nike created a 'personal trainer' for its customers with innovative characteristics. Its production is based on mutual incorporation of knowledge and technology. Such solutions make the company and its customers well informed about each other as well as keep them continuously connected [32], something that had never happened before. Nike, which had been a product-centric company, had become a customer-centric one. Whereas previously the product was the end point of the consumer experience, it has now become the starting point. In this deed the recipients are getting necessary or requisite services continuously as their solution and same time they can also participate by providing their feedback to designing of this solution which must meeting satisfaction level of customer in any time and any situation. Thus, the shared experience is working as a new source of value, helping to achieve value-in-keep for the customer.

B. Nissan–Renault alliance

The second case demonstrates that a business alliance is one of core mechanism to achieving a long-term sustainability and of aiding value for customer to influence global market power.

Company Overview

Nissan, a leading Japanese automobile manufacturer, has been providing innovative services since 1933. "Nissan has a proud history of leading the Japanese auto industry in product development, technological innovations and globalization" [33]. The company believes that by applying its know-how and long experience it can meet the challenge of enriching people's lives. In 1999 Nissan announced a 'Revival Plan' that led to business results higher than expected [33]. This gave the Nissan the momentum needed to implement its new plan, NISSAN 180.

The key to the success of these plans was a fruitful alliance with Renault, a French multinational automobile manufacturer, established in 1899 [34]. The company offers a range of cars and vans to the global market. In the past, it had also produced trucks, tractors, tanks, buses, coaches, and auto-rail vehicles. Renault has a number of subsidiaries around the world. Its automobile and sales financing divisions account for most of its business activities. The automobile division designs, manufactures, and markets vehicles, and the sales financing division handle sales.

Renault teamed up with Nissan in 1999 through an exchange of shares, creating the fourth largest automotive group in the world. The chairman and CEO of the company is Carlos Ghosn, and the French government owns 15% of the company. Their collaboration supported Nissan's continued advancement, enabling it to produce as well as deliver customer value by offering reliable services, technological innovations, environmental protection, and increased safety.

Outline of Alliance

The Nissan–Renault alliance is one of the most successful and biggest strategic alliances in the history of the automotive industry. Both companies were in a derailing situation [35] and came from different cultures. Renault was coming off a failed alliance with Volvo, and Nissan was facing a declining market share and great financial difficulty [36]. The announcement of their strategic tie-up came in March 1999 in Tokyo. Louis Schweitzer, Chairman and CEO of Renault, and Yoshikazu Hanawa, President, and CEO of Nissan Motor Co., signed a global partnership agreement. The negotiations, which lasted until May 28, resulted in equity participation with capital contributions from both companies, resulting in a restructuring of the infrastructures of both companies.

Both Nissan and Renault needed resources to reach their long-term goals. Renault was aiming to expand its market share in Asia, and finding a partner in Asia was critical to achieving this goal. Nissan was aiming to reduce its debt load, which was about USD 21 billion, and finding a financially sound partner was critical to its survival in the increasingly competitive global auto industry. Their fortuitous alliance raised a series of issues regarding the need to calculate the performance of the alliance.

The two companies took an open-minded approach to their partnership in the comprehending stage. The successful management of the alliance formation process [37] depended on the ability of the executives of the two firms. They initially took a long-term encircling view at critical passes rather than a short-term bargaining perspective. They quickly used the process itself to initiate strategic changes within their firms rather than waiting for an agreement to be signed [38].

However, for implementing the every plan successfully the company realized the innovating their infrastructure through learning from their own strengths and weakness [39]. They agreed to allocate their resources. Renault contributed USD 4.8 billion to the capital of Nissan Motor and USD 76.6 million to the capital of Nissan Diesel. In addition, Renault paid USD 305 million to acquire Nissan's five financial subsidiaries in Europe [40].

In October, 1998, Schweitzer proposed to Hanawa at a face-to-face meeting that they move closer together strategically instead of simply implementing an acquisition or merger due to the difficulty of a Franco-Japanese merger. Schweitzer suggested that they exchange skilled employees, especially at the level of the board of directors, chief operating officer (COO), vice president of product planning, and deputy chief financial officer. As a result, Carlos Ghosn from Renault was made COO of Nissan. Besides performing the duties of COO, Carlos Ghosn recognized the market value as well and he acted as a special customer aim to constructing true solution. He brought 20 skilled Renault managers with him and implemented radical changes in Nissan's management of product planning and development [41], design and strategy. The exchanged of personnel in management structure was more; namely Ghosn and Hanawa come as Board of Directors accordingly Nissan and Renault, Tsutomu Sawada joined as the Renault Management Committee and Yutaka Suzuki appointed for the Senior Vice President of Alliance Coordination Bureau. This sharing of resources resulted in innovations in the infrastructure (HR, product planning, finance, corporate planning and decision making, marketing, manufacturing, systems and engineering department).

Infrastructure Innovation

As illustrated in Fig.3, through this collaboration, Nissan and Renault have exchanged knowledge and shared strengths, by which both are permitting to each mate to take the deriving seat for supreme assistances from each partner's assets. Moreover, this collaboration gave to Nissan the confidence of innovate and create value for the market. And it gave to Renault the ability to expand its share of the Asian market and has enhanced its stature as a global market power.

In this event we are apprehending that the Nissan was belonged with market, technology and experience but only this capability was not good for sustaining in global business market as well as providing continuous value to customer as the company faced the difficulties of finance and well managing skill for strategy making or filling-up of its corporate vision. On the other hand, Renault had financing, management skills, and knowledge but lacked advanced technology and markets. Therefore, their infrastructures and resources were insufficient for surviving in the world auto market. Both recognized the need for infrastructure innovation and thus formed an alliance to enable them to share vital resources [42]. Renault shared such resources as

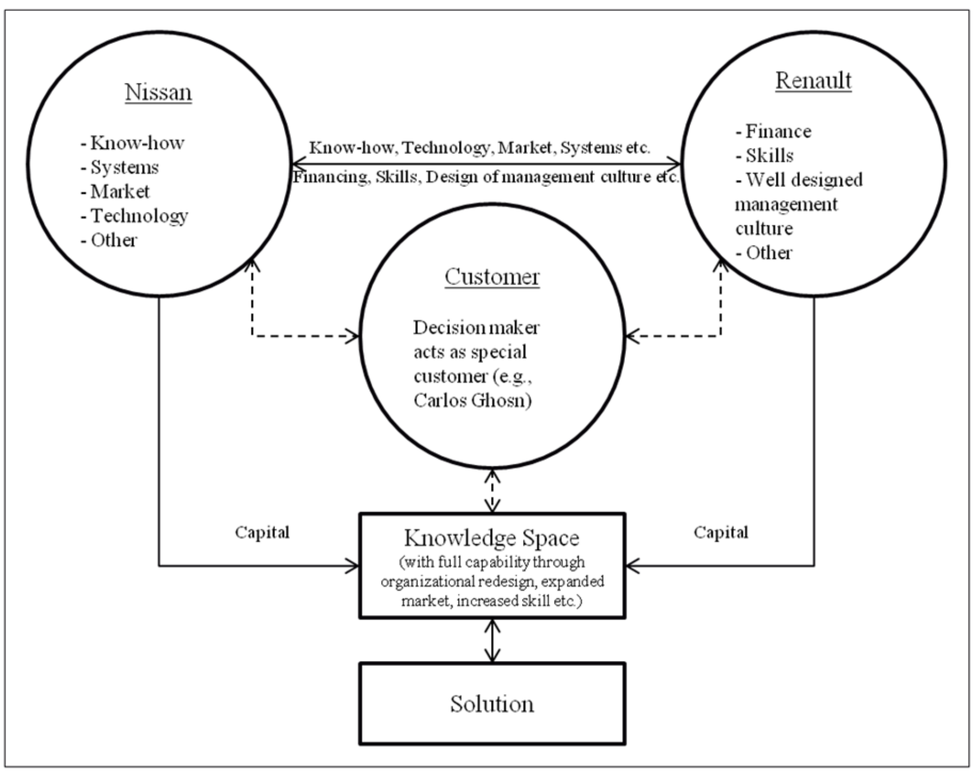

Fig. 3 Strategic alliance between Nissan and Renault resulted in value creation through infrastructure innovation.

financing, management skills, and knowledge and Nissan shared such resources as markets, technology, and experience. In this way, they reconstructed their internal or external specialty which is treating as infrastructure innovation of Nissan and Renault. As a result, they attained a win-win situation and became able to produce sustainable service value for their customers.

Value-in-Keep

Both Nissan and Renault had a critical lack of certain resources, so their alliance created a unique opportunity through the strategic exchange of inter-corporate strengths. They used their shared resources to redesign their infrastructures, which enabled them to increase their market shares, improve their production activities, and create customer-centric services in various areas. This kind of competencies changed their position and made a continuous value provider images, in so doing the both parties are currently leading world's car market.

V. CONCLUSION

The infrastructure innovation is necessity for service provider that can achieve through making collaboration with suitable business partner and customer. This mechanism not only helps to increase mutual values but also to enhance the sustainability of value co-creation. This study was conducted in response to the current lack of strategic corporate planning, where the organizations are very eager to promote value as solution with services rather than service value sustainability. There is a need to rethink the concept of service activities from the viewpoint of service value sustainability as well as value-in-keep. The service activities cannot produce sustained value without reliance on resources from the recipients. The developed model shows how firms can innovate their infrastructure by sharing competencies with other firms and co-creating experiences with customers. This research also provides a basic standpoint on technology, knowledge, and customer-based organization that will make sense to identify the type of company for making alliance. For practitioners, this paper presented two actual case studies in which companies achieved success through sharing of technology, knowledge, know-how, and experience, enabling them to redesign their organizational infrastructure and to come to recognize the market's as well as customers' long-term value. Ensuring the value-in-keep perspective of an organization requires constructive changes in the business platform through infrastructure innovation and collaboration with other organizations.

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