New Product Planning Process in the Age of Service Dominant Logic

Hiroyuki Sakano, Michitaka Kosaka

School of Knowledge Science, Japan Advanced Institute of Science and Technology, Nomi City, Japan

Abstract—This study is about the Product Planning Process in the era of Service Dominant Logic (SDL). It had been said during the age of Goods Dominant Logic (GDL) that the key to success in marketing was effectively adapting the Marketing Mix (4Ps). However, in practice, most product planners at that time only focused attention on "products" (goods), mainly by implementing the latest technologies then as far as the "price" (expected cost) was within their target. Although it actually worked well until the late 20th century, it has no longer been functioning effectively from the early 21st century. Product Planning in the era of SDL now needs to be a far more sophisticated process in the new Service Marketing Mix (8Ps). Unfortunately, we have no concrete "product planning theory" in the SDL age yet. Thus, we adopted four frameworks, as a first step, that were originally developed as tools for service value creation, which were also proved to be empirically valid in case studies on product planning in our previous paper. This research is the second step on how to integrate these frameworks toward the goal of achieving a "general theory for a product planning process" in the SDL age of marketing.

I. INTRODUCTION

The servitization of manufacturing companies has been widely discussed for years under the general transition from goods to services in the actual economy especially after the beginning of the 21st century. There has been limited empirical evidence to explore the extent to which it is being adopted in practice [1]. As Lusch and Vargo stated, the quest for a general theory of marketing has been elusive [2], and that for product planning in marketing is currently even more evasive to most product planners. Even so, most manufacturing companies' top management in such an uncertain environment in developed countries has continuously been asking their subordinates to launch the right (i.e., profitable) products with the right timing into the ever changing market with higher "hitting" probabilities. Thus, manufacturing firms should respond to survive in developed economies by moving up the value chain, seeking to innovate and create more sophisticated products and services, so that they do not have to compete on the basis of cost alone [3] against "commoditized goods" imported from developing countries. Yet, they can usually only achieve this goal at far lower hitting rates even though they have tried very hard by making utmost efforts to succeed. How can they launch commercially successful products in practice at much higher probabilities into marketplaces in this service economy? This is the main motivation we have focused on this theme and have put forward a new proposal, which is the new product planning process (PPP) model that is a core part of marketing that can be regarded as a "holistic process".

There are, however, still some influential methodologies being used for product planning or product design activities.

For example, the Stage Gate is well known as a new product process, which is mapping out the new process from ideas through to launches [4]. Conjoint analysis in consumer research has demonstrated indications of coming into its own as a practical set of methods for predicting consumer preferences for multi-attribute options in a wide variety of products and services [5]. "Seven Product Planning Tools" for new product development (actually including conjoint analysis as one of its main tools) have been developed in Japan [6]. It appears that some advocates of these frameworks have also felt the necessity to improve them so that they can make adjustments according to the undeniable servitization of manufacturing firms. For instance, the stage gate apparently needed to be restated by its originator because although the stages were laid out in a sequential stepwise fashion, indeed inside stages, there was much looping, many iterations, and back-and-forth play as the project continued [7]. Yet, this restatement just seemed to involve the normal day-to-day activities at most manufacturing firms even in the good old GDL days. Thus, there is still no new phase of resolve from the service point of view. Other than that, even more than a decade after the start of the new century, we have not been able to find significant new improvements (proposals) either in conjoint analysis or in the "seven tools". After all, these were the frameworks fundamentally developed for pure manufacturing in the goods centered era, and they are still being continuously applied, as they are, without service attributes, in this service economy. They are naturally no longer functioning properly. Thus, we desperately need product planners in the 21st century especially those in servitized manufacturing companies to create effective tools or frameworks that fit this service centric market. We proved in our previous research through actual case studies that the frameworks we proposed enabled the co-creation of new knowledge for new products with customers, and possible partners (e.g., subcontractors) [8], even though they still lacked detailed processes explaining what steps should be actually taken and how these frameworks could be integrated in practice. The following sections discuss further developments.

II. SDL BASED PRODUCT PLANNING PROCESS (PPP)

A. Basic Concept

Nobody can deny the servitization of economies regardless of accepting SDL as its principal reoriented philosophy. Then, how can we plan and launch competitive products into the marketplace in this service based society? It has been widely recognized in service science that the key to success is proposing the right values only if they satisfy their

target customers as values in use. Moreover, such values in use can often be regarded as new service innovations if they are original. Therefore, the next question is how can they be created them more effectively, in other words, at higher hitting rates, and how can processes ultimately be checked if such practice works? Now, the second question happens to suggest that product planning is a process that is a major (or core) part of marketing that integrates all related processes. The following presents some candidates for frameworks that were originally designed and developed for service value innovation.

B. Knowledge Space Theory

The original knowledge space theory was written by Doignon and Falmagne and published in 1985. They stated that information regarding a particular field of knowledge is conceptualized as a large, specified set of questions (or problems) and the knowledge state of an individual with respect to that domain is formalized as the subset of all the questions that this individual is capable of solving. A family of sets satisfying this condition is called a knowledge space [9].
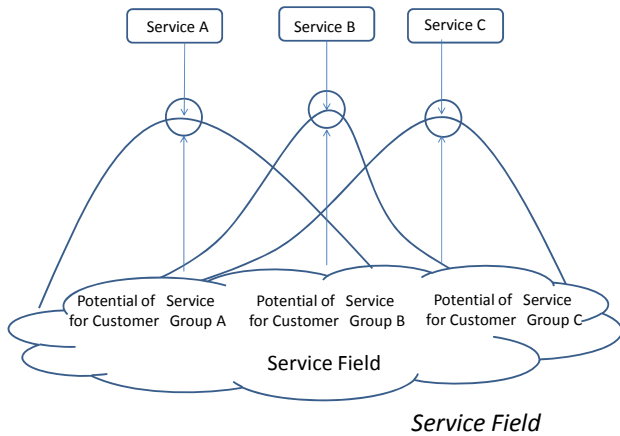

Fig. 1 Service Field

Kosaka initially claimed from a business point of view that "knowledge space (all knowledge from providers to recipients) is a dynamic virtual expanse where it has a fundamental optimistic relationship among participants with a solution" [10]. This suggests that knowledge space is a mathematical explanation of the "ba" originally initiated by Nonaka in 1996 that is a shared mental space for knowledge creation, which provides a foundation for knowledge creation [11]. Knowledge space is, therefore, the basis of our discussion on PPP.
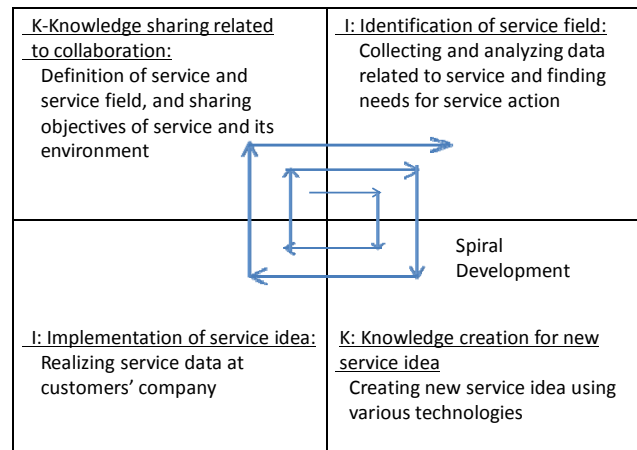
C. Service Field Concept

The service field concept is an analogy for the mechanism of electromagnetic fields, where the force on a moving charged particle is determined by the relation between electric charges and the field. Now, suppose if exactly the same

service were provided to some very different customers, the perceived value would vary depending on each customer depending on the situation they were in [12]. This has been experienced not only in pure service related businesses but also in manufacturing companies when they have offered products under the recent circumstances of servitization. In short, if one's perceived service value is determined by the "context" of the situation where the service is provided, it will be conceptually specified as:

$$(\text{Service Value}) = (\text{Service}) \times (\text{Service Field})$$

Thus, it is quite important for a service provider to "identify the service field" so that the service provider can maximize service values by adjusting or enhancing the service in such a service field. Yet, it is virtually impossible for the service provider alone to do so because each customer has different requirements in different situations and different circumstances. Hence, it is necessary to contact potential or targeted customers as recipients of services to jointly maximize the total service value. This is the core concept of the "co-creation of service values (i.e., values in use) as new knowledge in a service system.

KIKI Model

Fig. 2 KIKI Model

This new notion to improve service values is based on the service field concept in service systems, and it can be applied to various service activities in which targeted customers as recipients and the company as a service provider are co-creating service values. The roles of service providers and recipients (customers) are not distinct [13] within this context, where values are always co-created reciprocally.

D. KIKI Model

The KIKI Model, which was derived by Kosaka in 2012 [14], is a spiral two-dimensional model clarifying the service value co-creation process of knowledge emphasizing "experience", and incorporating the concept of the "service

field ", which we discussed in the previous section. The structure of this model is similar to that of the SECI Model [15] as a standard spiral model in the knowledge creation process. The SECI has four modes: Socialization (S), externalization (E), combination (C), and internalization (I). The KIKI Model also has four modes, viz., knowledge sharing related to service systems (K-1), identification of service fields (I-1), knowledge creation for new service ideas (K-2), and implementation of service ideas (I-2). While KIKI's four modes that purposely emphasize service value creation fundamentally correspond to those in SECI, the latter covers four specific aspects that are different (businesses, technologies & services, customers, and service providers) in the knowledge co-creation process in our day-to-day activities simultaneously within the four modes. Various technologies are required to execute these four steps of the KIKI Model, even though the systematization of technologies remains for future discussion. A spiral improvement in service value co-creation can also be expected in the service field by shifting positions in it and changing the service itself, as Fig. 2 indicates, through experience in collaborations.
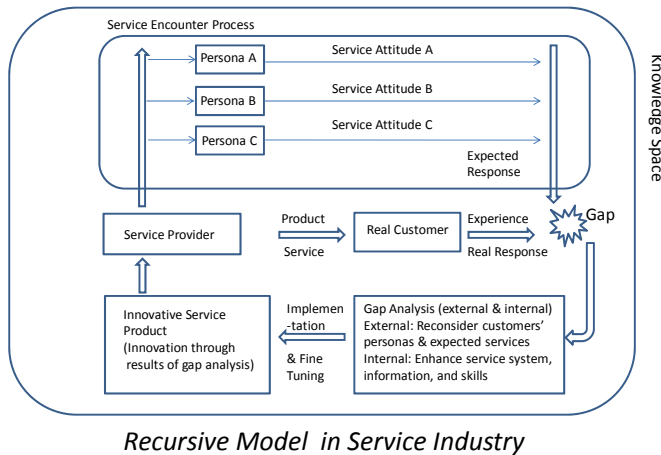

Recursive Model in Service Industry

Fig. 3 Recursive Approach in Service System

E. Recursive Approach

The recursive approach in service systems is also an analogy for the recursive model in the field of engineering. The value co-creation process between a company (service provider) and a customer (recipient) is working continuously by filling the gap between the recipient's expectations and perceptions, as seen in Fig. 4. The actual practice can be divided into three steps [16] as:

Preliminary Stage: To set up a persona

As stated earlier, one's perceived service value varies depending on the customers (e.g., gender, age, and education), and service providers tentatively assume a few virtually typical customer images (personas) by taking into consideration the customer data they have on hand coupled with their past experience. Despite these efforts, their assumptions are not always correct.

Secondary Stage: To determine service attribute specifications

The detailed service attributes are determined according to the personas they created, such as services and product lineups to maximize service values.

Final Stage: Service gap investigations and solutions

The service provider offers an established set of services (e.g., Service A for Persona A) in this stage, which usually does not meet the real expectations of the customer. Then, the company tries to fill the gap by analyzing his/her expectations and perceptions. These three steps are continuously cycled as long as the service is provided. The perception gap is eventually narrowed and is ideally disappeared.
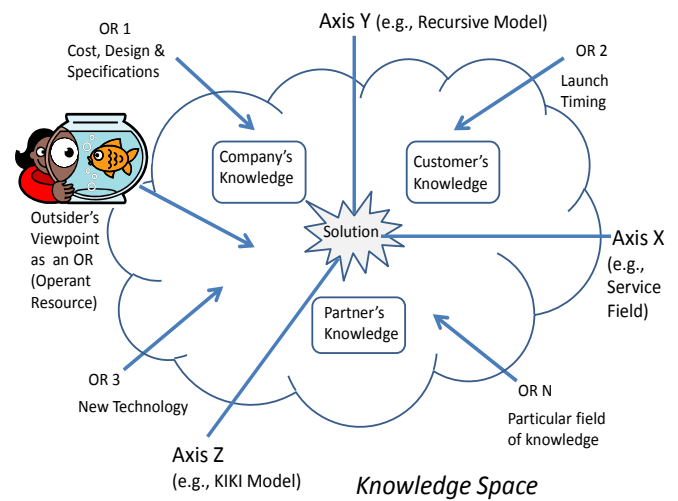

Fig. 4 Knowledge Space in Product Planning Process

F. Knowledge Space in Product Planning Process

All those frameworks are regarded as axes in this knowledge space (see Fig. 4 as a whole picture). It is essential to check through some "analytical axes" (perspectives from different angles) to facilitate PPP. This is because participants can only create competitive values in use with new products by co-creation with their customers and partners as SDL has predicted through two or more "axes of knowledge" from different angles in a common or shared "knowledge space". If it is generated through one axis, it will easily be copied and soon lose its competitiveness. This basic concept has led us to propose the PPP model as well as to test and verify the validity of predictions with SDL. Now, we are ready to discuss case studies in which one of the researchers was directly involved.

III. CASE STUDIES

A. Hand-held-terminal-based Restaurant Ordering System

Company A released a sleek hand-held-terminal-based system using electromagnetic induction technology as a method of data transfer. This was a lightweight-drip-proofed

very thin hand-held terminal originally designed for data collection purposes at factories. However, the company could not find potential customers for this system in the targeted industry due to its small memory size and LCD (only two lines). The sales people in charge then took it to some service companies seeking non-factory uses. They soon found that there was no useful application software available even for demonstration purposes, other than that for data collection that factories used. The president at one of the leading software companies then saw it and stated that this system could be used in restaurant chain environments for order-taking purposes even though he was an outsider of that industry and had no connections to restaurant chains. Fortunately, one of the software engineers at Company A used to work for a leading restaurant chain as a part-time server when he was a student. He immediately created a simple demonstration application for the system according to restaurant operations. The project manager, who acted as the product planner, then took this demonstration sample to another leading restaurant chain. As soon as he showed the sample with the idea to the general manager (GM) of information systems, this GM decided to assign a test site (actual restaurant) and asked the restaurant's staff to fine-tune the demonstration software for actual use. This system nicknamed ROSY (Restaurant Ordering System) had successfully been launched in all their restaurants (about 500) by the end of 1986. Since then, this restaurant chain has been continuously using several generations of the hand-held- terminal-based ordering systems from Company A despite competitive tenders from rivals every five to six years.

There were several factors (*a–e*) leading to this success.

a) An outsider's fresh idea (i.e., possible use in restaurant chains) was suggested and then fortunately accepted by relatively flexible upper management.
b) One of the system engineers happened to know about basic chain restaurant operations and was able to make a realistic demonstration application to appeal to the restauranteurs.
c) The GM of Information Systems at this leading restaurant chain had been looking for something new to differentiate its services from those of its competitors.
d) Once the test site was assigned, the company and customers had regular meetings to exchange opinions along with contracted software house staff, and they successfully co-created much new knowledge such as how to shorten serving times, how to decrease the number of mis-orders by utilizing this system with kitchen printers, and how to send messages back.
e) The product planner at Company A then acted as a total project manager of the team that consisted of members from these three parties. The company was therefore successful in gaining the confidence of customers.

Above all, almost all team members (including one of the researchers) were excited in the middle of the test period and had no doubts about the great success of this innovative system. They had actually felt that they were not only co-creating a new innovative system but also brand new concepts and values in the industry.

B. Electronic Dictionaries with Full Dictionary Content (for the Japanese Market)

Company A had been marketing electronic reference products since the late 1980s mainly in Japan and in the U.S.A. They initially designed small and inexpensive reference devices all of which were designed and assembled in Japan. Then, all the products started to be assembled in China in the early 1990s, through sub-contractors in Hong Kong, due to a decrease in profits. Commoditization started and Company A naturally wanted to shift the product line to one that was more "value added" as the market then was not growing with decreased profit margins. A comprehensive dictionary product featuring two full size dictionaries (English-Japanese & Japanese-English from the same publisher) was planned and released in 1993. It was well received despite having a relatively high price. A newly assigned product planner with an engineering background insisted the current model be integrated with a huge Japanese dictionary (Japanese-Japanese from another publisher) which was sold as a different model in 1995. This idea was almost "out of the question" for those who knew the Japanese publishing industry well just because the second publisher also published some other English-Japanese & Japanese-English dictionaries. It had also been believed that both publishers would refuse to allow the dictionary data to be licensed to Company A even if this product plan was proposed. This product planner, however, dared to visit two leading Japanese publishers several times and, finally, obtained both of their approvals to license the latest editions of their dictionary data even before they were printed and integrated into the same product and combined into one complete product. The sales figures for this electronic reference business for Company A after the launch of this new product almost tripled within a year. It could almost enjoy a monopoly market in Japan for the next three years until two larger companies entered the same market with the same concepts. However, it still enjoyed a dominant market for another three years or so.

There were several factors (*a–e*) in their success.

a) A newly assigned product planner's fresh idea (i.e., a possible combination of dictionaries from two leading different publishers to build a new product) was unexpectedly accepted.
b) Company A had been providing their know-how on the digital format for dictionaries to these publishers since they started licensing the data. In return, the publishers had provided the very latest edition of dictionary data (even before printed versions were available), which had originally been prepared for paper publications. Sometimes, engineers found typos and other errors in the original digital data and regularly reported these to the

publishers. The software engineers actually helped publishers' proofing work.

c) The dictionary publishers initially regarded Company A as a competitor with publishing companies. Yet, they gradually found Company A was a partner in the same (i.e., e-publishing) industry.

d) Some university professors and academic scholars started supporting electronic dictionaries. They also demanded combinations of comprehensive dictionaries for their own use. They unintentionally became advisors or potential partners.

e) The sales turnover of printed versions of dictionaries has slightly dropped year-by-year due to the decline in the youth population regardless of digitalization of publications. In other words, the publishers have needed to find other resources of income.

C. Electronic Dictionaries with Full English Dictionary Content (for UK Market)

Company A then considered getting into the general export market again, apart from the U.S. market where its subsidiary had operated for years, because of the unexpected successful results in the Japanese market. There were, however, local competitors in each of the major markets (e.g., Germany, France, China, and Korea). The main reason was the fact that reference products were highly culture (i.e., language) oriented and labor intensive artifacts. Quite different monolingual dictionaries were used even in the U.S. and U.K. Company A's decision was to develop a new British-English based model. The U.K. market had been considered a small closed one and Company A had never been successful in any related business before.

There were several factors and facts (a–d) that might have reversed their negative history.

a) Even though the U.K. was a small market, British English is taught and used world-wide. Unlike the American version, the U.K. version of reference products can be sold as general export models besides the U.K. market. It helps to minimize development and stock risks.

b) The UK market was dominated by an American competitor (Company B) with 90% market share. Yet, the dictionaries they featured were simple modified versions of American Dictionaries (e.g., spellings). Further, the U.K. market in general was regarded as a commodity market.

c) The Japanese product planner at Company A, as a sort of outsider, favorably considered the "branded combination" of a monolingual dictionary (Oxford) and a concise encyclopedia (Britannica) while the partner (the GM of their U.K. distributor) had a negative opinion against this idea though he personally liked it. Finally, both publishers agreed on this combination subject to certain conditions.

d) The marketing manager at the U.K. distributor was extremely cooperative and suggested many ideas as an English native, which led to many co-created features

(e.g., crossword solvers and quotations for speech functions)

The reaction from the market was quite favorable from the beginning. The fifth generation of "reference shelf" products are currently sold at major retailers and on-line book sellers in the U.K. as well as in other (British) English speaking countries.

D. ThumBoard (Micro Keyboard) for PalmPilot (PDA)

Company A formed a new U.S. subsidiary in 2001 after it relocated its U.S. headquarters (HQs) from California to Texas. A newly hired marketing manager proposed a new product concept that popular personal digital assistants (PDAs), PalmPilots, and Visors be equipped with a very small keyboard. The concept in the early stage had involved consultations with some buyers at leading retailers in the U.S. They all welcomed this idea and provided optimistic forecasts for it, and some of them even placed good volumes of initial orders, subject to certain cost guidelines and launch timing. Therefore, this new U.S. subsidiary company committed their HQs (i.e., Company A) to a huge quantity of products for the coming 12 months. Company A asked Company C in Hong Kong to design the small devices to minimize R&D costs, and the latter achieved both the cost target and met the development, manufacturing, and delivery schedules. Even though the products were exported to the U.S. as scheduled and delivered to the retailers at the targeted retail price in time, sales were extremely poor. The main reason for the unacceptable results, according to the marketing manager who acted as the product planner, was that the sales of PDAs had declined drastically since late previous year and nobody wanted add-on devices for them anymore.

There were several factors and facts (a–d) that might have caused the disappointing results for sales.

a) This was an idea anybody in the industry could think of. The critical issue was who could launch this into the market first at an affordable price. Even though the targeted launch time and cost were strictly adhered to by all stakeholders, there had already been some competitors in the market, and there was no demand or demand that was quite weak even for PDAs when the ThumBoards were launched.

b) Buyers' opinions were initially very favorable. Most of them actually purchased the initial quantity they had committed to. However, there were no direct opinions from the actual users of PDAs. As a result, they did not sell and no additional orders were placed.

c) The results from market research were favorable. The sales of various accessories for PDAs were growing "then".

d) The marketing manager as a product planner himself was not even a user of PDAs and simply followed the results obtained from market research and the opinions of buyers. He had never interviewed actual users to check if they wanted add-on keyboards.

E. Electronic Dictionaries with E-book Reader

Company A exchanged an omnibus agreement in 2006 with a longtime American rival, Company B, so that both companies could jointly compete against two larger Japanese competitors worldwide. Company B intended to enter the Japanese market with their newly designed strategic reference products featuring the latest e-book readers by utilizing the sales channels of Company A. The technology for these e-book readers was originally from France. Yet, it was then owned by Company B, and was eventually sold to leading on-line book sellers in the U.S. It is used as the core technology for their e-book readers even today. Although their original brand name as vendors of e-book readers was relatively well known in Europe and the U.S., there were no Japanese versions of e-book readers yet and they were unknown. This was a concern shared by Companies A and B when they started the project. The results they obtained were even worse than their concerns.

TABLE 1 COMPARISON OF CASES IN KNOWLEDGE CO-CREATION

	Co-creation of Knowledge	Proposition of Value in use	Contribution by Outsiders	Primary Unit of Exchange	Business Results
Case 1 Restaurant Ordering System	Yes, many. But, most customers' know-how are masked	Yes, it is valid till today due to the customization for each customer	Yes, an advice from outsider in other industry was triggered	Service Value for accurate & quick order-taking at Restaurant Chain	Very Good. profitable. Created a market . Still going
Case 2 Full Contents E-Dictionary (Japanese Market)	Yes, a few. Some knowledge are protected as IP	Yes, it is valid till today though many of them are copied by others	Yes, an advice from engineer who did not know industry was triggered	Service Value for combination of full size dicts. from other publishers	Very Good. Yet, soon profit became thinner
Case 3 Full Contents E-Dictionary (UK Market)	Yes, both UK and Japanese stakeholders worked well	Yes, even contents provider agreed	Yes, a Japanese Salesman's opinion was taken	Service Value for combination of Oxford dicts. & Britannica Encyc.	Very Good. Profitable. Still in the market
Case 3 ThumBoard® for PalmPilot®	Little though some IPs were registered by two companies	Little. Timing was too late due to slow down of PDA sales	None	Service Value for add-on function as a small PDA keyboard	Very Poor. Timing too late
Case 4 E-Dictionary with E-Book Reader	Almost none. NIH Syndrome between two companies	Small. Timing was too early (No Japanese E-Book Reader was ready)	None	Service Value f/ combination of dictionaries & e-book reader in one case	Poor. Timing was too early. Discontin-ued soon

*There were several factors and facts (*a–d*) that might have caused the poor sales results.*
a) There were no activities for real collaboration between Companies A and B even though they held regular meetings every month either in the U.S. or in Japan.
b) There was no value co-creation rather than creating two new models at the target price in time. The sales force at Company A had just gone about their daily routine work (e.g., selling these new products from Company B to leading retailers just like they had sold other new products from Company A).
c) Although some people then had already talked about e-books and e-book readers, hardly anybody in Japan really used e-books (especially English-only versions). Apparently, it was too early for the market to accept them.
d) It appears that the Not Invented Here (NIH) syndrome existed at Company A. Even in Company B, especially its engineers, claimed they could not understand why they needed to cooperate with Japanese competitors. Clearly,

neither of them then had an "open innovation" mind-set yet.

IV. PROPOSAL

By now, it is possible for us to draw some common elements and factors from successful and failed cases in Table 2. Of these, it appears that cases in which the knowledge co-creation process with customers (recipients of services) worked well were mostly quite successful. However, cases in which even simple collaboration between two companies in the same industry did not succeed, despite their ambitious plans, were disappointingly unsuccessful regardless of what advanced technology was used and how high the companies' expectations were.

TABLE 2 COMPARISON OF CASES THROUGH FRAMEWORKS AND ORS

	Knowledge Space well worked?	Service Field well identified?	Knowledge Co-creation (e.g. KIKI) achieved?	Recursive Approach well worked?	Outsider's Opinion well adopted?	New or Advanced Technology used?	Demand/ Supply/ Timing matched?
Case 1 Restaurant Ordering System	◎	○	◎	◎	○	△	◎
Case 2 Full Contents E-Dictionary (JP Version)	◎	○	◎	○	◎	✕	○
Case 3 Full Contents E-Dictionary (UK Version)	◎	◎	○	○	◎	✕	○
Case 4 ThumBoard for PalmPilot®	✕	△	✕	✕	✕	✕	✕ Too late
Case 5 E-Dictionary with E-Book Reader	✕	△	✕	✕	✕	◎	✕ Too early

◎: Excellent ○: Good △: Fair ✕: Poor

All four frameworks worked properly, much to our surprise, in the most successful case of the Restaurant Ordering System (ROSY). All members involved in the project in the shared (virtual) knowledge space really co-created a great deal of new knowledge (e.g., how to shorten the serving time by sending orders through radio waves and how to decrease mis-orders by using printers rather than manually writing order slips) while they jointly worked at a (real) test site where some engineers had actually worked as servers. They could actually feel the "service field" and identify it through the relationship they had with customers (both restauranteurs and their guests). Twelve months of experimental use of "ROSY" at the test site generated a "spiral of new knowledge", which turned into tremendous service values that enabled them to install this new system into all their 500-plus restaurants. Fortunately for all parties, "recursive feedback" has functioned up until now without it being obviously noticed.

New product planning and development practices are generally systematic and innovative activities that are not simply achieved by a single gifted person but participated in by various team members involved with most manufacturing

companies. Unless these members share new knowledge on new products, efforts will probably end in failure because such knowledge will not be effectively implemented into products as value propositions. The co-creation "process" with customers in common knowledge space, ideally in a mutually identified service field, is essential to create such values. Using the recursive approach quite effectively narrows the gap between customers and companies during these processes especially when tentative value propositions need to be fine-tuned. Not to mention, launch timing is very important for any new product. If introduced too early or too late, no could-be-innovative product can be regarded as innovative just because one's value in use is not eternal but has limited lifetime. The perceptions of value in use sometimes change dramatically even for the same customer depending on the situation he/she is in then. The timing issue can be considered as a part of the "identification" of the service field. Additionally, demand is not always visible and customers may not yet be aware of any potential demand. Therefore, product planners need to act as "foresight managers" to organize all related knowledge shared by companies, customers, and partners and generate possible values in use through the knowledge co-creation process on time. Last but not least, having the eye of an outsider is also very important because his/her opinion is often stated from different angles, which is far from an insider's perspective. This sometimes (although not always) works just like a "catalyst" which turns an ordinary knowledge co-creation practice into an innovative service value.

A simple multi-cyclic model that summarizes the basic concept of PPP is now proposed, and has been outlined in Fig. 5 based on the discussion above. The model outlines the knowledge co-creation process, which is not linearr but a series of spiral processes starting from the knowledge sharing process where stakeholders (e.g., the companies, customers, and partners) share and exchange their particular knowledge to find solutions (i.e., ideas on new products). The next step is new knowledge co-creation after a few cycles of this first stage. This is the stage for generating some possible solutions.
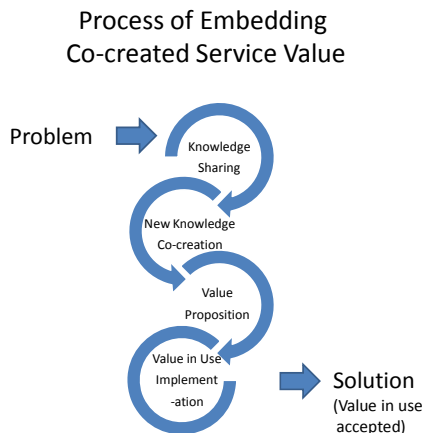
Some ideas can usually be obtained in this phase. Yet, it is too early to determine if they are real solutions. A value proposition is eventually determined in a few more additional cycles. Again, it is too early to finalize the process. Value implementation is the next and almost the final process. Even though value proposition seems to be accepted by target customers, it is sometime difficult or impossible to implement in actual products due to various unexpected reasons (e.g., cost and technology). Finally, it can be regarded as a solution that is eventually called a successful new product after this PPP process, but only if the customer accepts this value proposition as the value in use (i.e., service value). In most outcomes, these successful cases are products with "service innovations" regardless of what technologies are used. Interestingly, these cases demonstrate products equipped with the latest or most advanced technologies are not always successful (see Table 2). A good combination of current technologies with other adequate operant resources (ORs) may attract customers rather than the direct implementation of leading-edge technology. This is because customers do not value advanced technology but actually appreciate the total value in use embedded in a new product, unlike what most engineers and product planners believe.

V. CONSIDERATTION

While almost everybody agrees that servitization of manufacturing companies was inevitable in developed countries, Lusch and Vargo clearly analyzed this shift conceptually in 2004, as was previously stated. Yet, there are no firmly established general theories or effective tools (frameworks) that have adopted this shift to date, as far as we know. Furthermore, few research papers seem to have been submitted on this shift. As a result, most practitioners would not know how to react against this drastic change especially in the product planning process in actual marketing. We found how to adapt the "value in use" most effectively in the product planning process so that it became an essential task for product planners. Then, we collected successful and failed case studies and analyzed them with the latest frameworks originally developed for service value creation. Thus, we were able to propose our new product planning process (PPP) model that demonstrated the basic process on how to effectively proceed through following its steps.

We made six main findings in this research.

1. Product planning is a core process in marketing activities.
2. Knowledge space is the home of the product planning process.
3. To identify the service field with all stakeholders is quite helpful to facilitate the co-creation of new knowledge.
4. Two or more analytical axes (i.e., frameworks) and using a few ORs (operant resources) such as a particular field of knowledge are very effective to check progress in forming the correct value proposition.

Process of Embedding Co-created Service Value

Fig. 5 Process of Embedding Co-created Service Value

5. The proposed value (i.e., value proposition) can be regarded as the value in use (service value) only if the target customers accept it sufficiently well.

6. Any unaccepted value proposition can be feedback and fine-tuned even after the launch if the situation allows (see Fig. 3). This is especially effective in new PPP targeted at pure service industries (e.g., restaurant ordering systems in chain restaurant environments).

In conclusion, the integrated product planning process, along with its effective frameworks in each step, is outlined in Fig. 6. This process is virtually executed in sequence in the knowledge space we described in Fig. 4 as the basis of our discussion.   To work this process properly, besides all stakeholders as participants, ideally, with an outsider as a potential catalyst, the Axis (proposed frameworks) as evaluators/facilitators and certain ORs as "food for service value co-creation" are indispensable.

Finally, the main limitation of this research was that while the cases clearly proved the effectiveness of these frameworks as highly usable tools in practice, the actual product planning process for each case was executed without knowing about these frameworks since they were the cases before these frameworks were developed.   In other words, these cases are ex post facto reasons. Therefore, any successful case that can deliberately follow those steps in PPP that would naturally lead to knowledge co-creation is eagerly awaited in actual commercial practice.   It would endorse the effectiveness of the PPP model so that product planners could operate their tasks more effectively in this ever-changing servitized society.

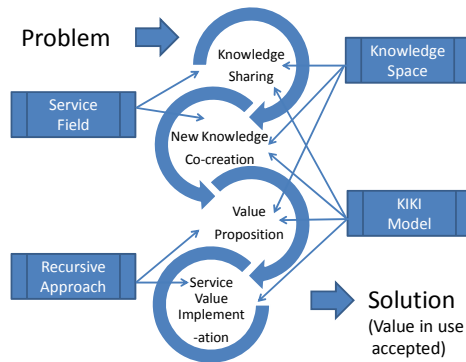## Proposed PPP Model for Embedding Co-creative Service Value

Fig. 6 New Product Planning Process (PPP) Model

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