

A Study on knowledge-based service process

Service Dominant (S-D) Logic

ABSTRACT

Purpose – The worldwide industrial focus is transitioning from production-oriented assembly and production to customer-oriented value co-creation. The knowledge-based service sometimes accompanies product delivery. The aim of this paper is to apply lean thinking to knowledge-based service processes and present two service models which can enhance both customer satisfaction and value.

Design/Methodology/approach – This paper is based on a review of the research of lean thinking, knowledge-intensive business service and service-dominant(S-D) logic. We developed two theoretical knowledge service models which are the Lean-Service Model (LS Model) and Knowledge-Service Model (KS Model). They present a case study research applied to the W. L. Gore & Associates Incorporated, the Fortune Magazine top 100 Best Companies to work for, 2013. Data derives from documents, mediums and interviews with the Asian Pacific Technology Consultant Team.

Findings – Derived from LS model and KS model implications, we realized that customer value can be distinguished to both functional value and solution value. Through co-creation with the customer using knowledge service and applying the KS model can achieve the differentiation advantage, while taking the LS model advantage, which is waste elimination and value creation.

Research limitations/implications (if applicable) – Because of limits to time and resources, this study has been applied to one representative company. For further development, we can do more case studies to get more proof.

Practical implications (if applicable) – The study derives the successful knowledge service model.

Originality/value – To study knowledge-based service with the customer value is very rare.

Key words : Service Dominant Logic, Lean Thinking, Lean Service, Knowledge-based Service, Customer value, value co-creation

Paper type –Research paper

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Introduction

Knowledge is the pillar of the twenty-first century, a key resource that all nations rely heavily upon in order to compete (Drucker 1995). "The knowledge-based economy" was first seen and introduced in a 1996 General Distribution from OECD. It says "knowledge-based economies -- economies which are directly based on the production, distribution and use of knowledge and information" and emphasizes that "knowledge is now recognized as the driver of productivity and economic growth, leading to a new focus on the role of information, technology and learning in economic performance (OECD 1996)." The term "knowledge-based industries" usually refers to those industries which are relatively intensive in their inputs of technology and/or human capital (OECD 1999)." In this paper, we are going to discuss knowledge-based service, the types of services that are provided based on knowledge and technology; those include manufacturing industries, IT services, finance, insurance, personal services and others.

Many scholars have been studying "knowledge-based service" but few have discussed the knowledge flow and service process. The two main topics of this paper are: 1. How to identify the knowledge that a target customer is looking for, and, 2. the way in which the knowledge should be provided. Compared with other types of service, "knowledge-based service" requires a much more thorough understanding of the target customer's needs. The process of providing "knowledge-based service" can also be seen as a process of co-creation with the customer.

"Knowledge-based service" is critical to global industrial development; however, there are few quantitative studies on how the tangible product of "knowledge-based service" is provided and how the intangible content of "knowledge-based service" is diffused. This paper will try to discuss whether it is possible to apply the principles and methods of lean study to "knowledge-based service", in hopes of increasing efficiency and effectiveness.

Service and Knowledge-based Service (KBS)

Jean Gadrey and collaborators (1995) defined service operations as :

"To produce a service, therefore, is to organize a solution to a problem (a treatment, an operation) which does not principally involve supplying a good. It is to place a bundle of capabilities and competences (human, technological, organizational) at the disposal of a client and to organize a solution, which may be given to varying degrees of precision."

Miles (1995) further studies the details of service, including its nature and its characteristics. Refer to Table 1 for an abstract of Miles' study.

Table 1 : The Characteristics of Services

SERVICE PRODUCT	
Nature of Product	Immaterial, often information-intensive. Hard to store or transport. Process and product hard to distinguish.

Features of Product	Often customized to consumer requirements.
SERVICE CONSUMPTION	
Delivery of Product	Production and consumption coterminous in time and space; often client or supplier has to move to meet the other party.
Role of Consumer	Services are 'consumer-intensive' requiring inputs from consumer into the design/production process.

Source : excerpted from (Miles, Kastrinos et al. 1995)

Knowledge-Based Services (KBS), commonly referred to as Advisory and Assistance Services (A&AS), “relates to tasks that require the application of detailed processes or technical knowledge”(DAU 2013). Knowledge-Intensive business service, KIBS, is a type of KBS which acquires one or some of the natures of KIBS: (1) need heavily professional knowledge, (2) is an information or the source of the knowledge, (3) use their knowledge to produce intermediary services for their clients' production processes, and, (4) are of competitive importance and supplied primarily to business(Miles, Kastrinos et al. 1995). Based on the definitions above, Miles tries to define Knowledge-Based Services from three aspects: the nature of the organization, target customer and the content of the service.

KBS is a type of service that emphasizes co-creation with the customer, and is therefore an interaction, rather than just a service(Edvardsson, Gustafsson et al. 2005). As a matter of fact, KBS is also a knowledge-transfer activity that takes place between the KBS provider and its customer enterprise(Rajala, Westerlund et al. 2008). This sort of mutual-learning process is rather obvious during a KBS activity. Interaction causes mass knowledge-transfer and re-creation between the KBS provider and its customer. Furthermore, there are multiple interactions. Some knowledge-transfer creates tangible outcomes, like software, written reports, graphs, designs, projects and criteria. Others are much more complicated and may not be easily presented. Knowledge flows between service provider and client firms can be discrete/tangible or process-oriented/intangible knowledge, as table 2 illustrates.

Table 2 : Knowledge flow between service providers and their client firms

Discrete/Tangible	Process-Oriented/Intangible
<ul style="list-style-type: none"> • Training • Benchmarks • Software package • Written reports (e.g. feasibility study) • Project Plan • Drawing/design • Product documentation (manuals etc.) 	<ul style="list-style-type: none"> • Routine problem-solving as part of everyday project work • Improved capability to collaborate in project teams • Sparring partner (testing of ideas client firm) • Introduction to new networks of professionals/user groups • Information on performance of competitors

Source: based on (Hertog 2000)

This study defines -- based on the description of these scholars -- KBS to be a process of the knowledge-transfer from KBS providers to their customers and a co-creation between KBS providers and their customers by integrating production together(Edvardsson, Gustafsson et al. 2005). KBS is a continuous process by which client firms acquire knowledge from KBS providers by official and informal activities.

Lean Research

Lean Thinking

In 1990 the book *“The Machine That Changed The World”* (James P. Womack 1990) introduced the Toyota Production System to western society. Since then the concept of “lean production” has influenced industrial production, which has become a mainstream concept for manufacturers. Womack and his partners (1994) think lean production mixes the advantages of handcraft production and the advantage of mass production, lowering unit costs while significantly improving the quality of the product. It also offers the possibility of providing customization while igniting and inspiring employees with satisfaction and energy.

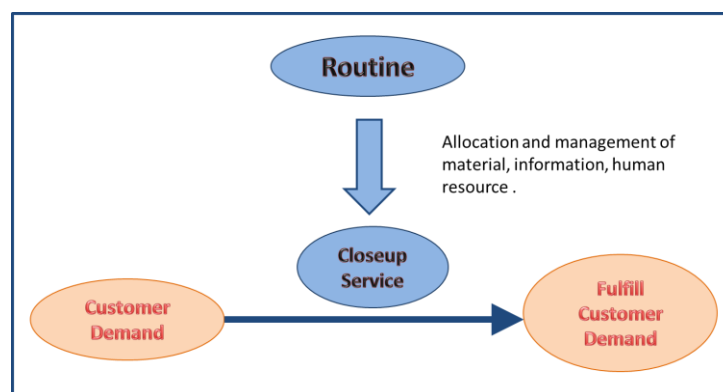
Womack and Jones present five principles to: 1. identify value; 2. to identify the value stream; 3. to make the value stream flow efficiently; 4. to draw the manufacturer closer to the end customer; and, 5. to aim for perfection (1996). The most critical concept here is ‘value.’ that means increasing the value of a product by adding a new feature or a function, or by eliminating unnecessary ones. The value is built upon the actual need of the customer and therefore is decided by the customer.

Lean Service

After Womack and Jones identified the critical role to lean thinking in service, many from academics, society and from industry have responded to what they proposed in 1996 (Atkinson 2004, May 2005, Abdi, Shavarini et al. 2006, Ehrlich 2006). A study by Bowen and Youngdahl (1998) try not only to explain what lean production is, but also to implement the concept into real service operations. In order to achieve customer satisfaction, they believe enterprises should try to integrate the lean principle to increase the quality of service, to lower costs and to increase profits.

Within the realm of lean research, one Japanese scholar, 小菅竜介 (2009), proposes the lean service process model ought to be focused upon customer expectations. As Figure 1 shows, the main concept is to design a system based on the customer’s view point, and provide service to meet that individual customer’s demands.

Figure 1 : Lean Service Process Model



Source: 小菅竜介 (2009)

Lean Knowledge Work

In 2011, Staats and Upton presented a study on IT, finance, engineering, and legal services suggesting that lean knowledge work can actually benefit from applying lean principles by generating documents for tacit knowledge, eliminating activities that require applying judgment and training employee to

continuously reduce waste. When knowledge is simply tacit, efficient collaboration can be achieved by creating systems and rules to guide worker interactions.

In the same year, Staats and Upton specifically identified six principles: 1. continually root out all waste; 2. strive to make tacit knowledge explicit; 3. specify how workers should communicate; 4. use the scientific method to solve problems quickly; 5. recognize that a lean system is a work in progress; and, 6. have leaders blaze the trail so everyone else understand where they are to go.

We can therefore conclude, based on a study of Staats and Upton, that both “root out waste” and “value creation” are the cornerstones of lean knowledge work, and both have been successfully applied to knowledge-based service.

Lean KBS Models : Lean-Service vs. Knowledge-Service

KBS Process: Service Process vs. Knowledge Process

Scholars often think that providing services requires technological, human and organizational capabilities(Gadrey, Gallouj et al. 1995, Hertog 2000). Schlesinger and Heskett (1991) suggests that the “service-driven” model requires the following:

- place equal or greater emphasis on investment in people relative to investment in equipment;
- use technology as a means of front-line support rather than replacement;
- make recruitment and hiring important for all employees, not just management; and,
- link compensation to performance for employees at all levels.

Human Resource allocation is the key to launching quality service. Knowledge resources can be categorized in table 3:

Table 3 : Knowledge resource

Discrete/Tangible	Process oriented/intangible
Non-human(capital, written information) embodied	Human embodied
Explicit/Codified	Tacit/non-codified
Contractual	Non-contractual

Source: based on Hertog (2000)

Combining the viewpoints of KBS-category and knowledge-resource category, we therefore divide KBS process into “service process” and “knowledge process.” Service process is a process to pack knowledge in an explicit module that can be delivered. Its purpose is to provide information accurately and quickly. Knowledge process is a process to deliver the knowledge that is streamlined into tacit service activities. Its purpose is to provide knowledge to the customer that goes beyond customer expectations.

Table 4 : Characteristic of service process and knowledge process

Knowledge-based service Process	Service Process	Knowledge Process
Type of knowledge that is being delivered	Tangible	Intangible
Knowledge Flow Characteristic	✧ Discrete ✧ Non-human(capital, written information) embodied ✧ Explicit ✧ Contractual	✧ Process-Oriented ✧ Human embodied ✧ Tacit ✧ Non-contractual

	✧ Standard	✧ Non-Standard
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Source: reference Hertog (2000)

Co-Creation with customer by KBS

In the course of studying customer value, “good-dominant logic” decides that the value is determined by the trading value and that the value is created solely by the enterprise and the customer merely accepting that value. For the last 10 years, good-dominant logic has been replaced by service dominant logic that “focused on intangible resources, the co-creation of value, and relationships.(Vargo and Lusch 2004)” Vargo and Lusch both think “integrating goods with services provides a richer foundation for the development of marketing thought and practice.”

Service-dominant logic emphasizes that, from the customer's point of view, what the customers really care about is whether or not the service provider can resolve the issues that keeps them from enjoying the convenience and efficiency that are supposed to come with the product or service, rather than what the enterprise is actually providing. The value of a product is decided by the value it can create. Only by creating a value for the end customer can the product or service be worth any value. Therefore, the value is co-created by both the customer and the enterprise as illustrated in table 5. The value of a product is determined by the user experience; as a result, experience and perception are both indispensable in this value-determined process(Vargo and Lusch 2008).

Vargo and Lusch (2004, 2008) introduced the idea that customers are the co-creators of product value. Many other scholars have since offered the same point of view. This concept was highlighted in a study from Grönroos and Ravald in 2011: customers do whatever they think is important which can offer the service they expect. Customer can therefore decide the value they can create with the product.

The relationship between KBS and the customer is not only sell-and-buy but is also a close and invisible interaction. This study divides customer value into the following two categories:

1. Functional value

The functional value satisfies the very basic need of a customer. There is a certain basic function and value existing in each product, even the tangible knowledge product. In knowledge-based service industries, one obvious example is the written document and statistics paper. The value of such products can be measured by subjective standards. Its value is the price that is paid by fair trade.

The value is created by the KBS provider/enterprise. Customers are excluded in the process of the value-creating and are merely receivers. Customers were not involved and did not need to interact with KBS employees in the design and production of the product. Customers are able to enjoy the benefits of a product by merely following the instructions from the user's guide, which provides necessary technical information.

2. Solution value

The solution value satisfies the needs of a customer's tacit knowledge. The KBS enterprise/provider needs to be in the same place with the customer and understand deeply the requirements through long-term interaction. Then the provider can propose a total solution for the client. In this situation the value of a product is determined by experience and perception. Depending on personal viewpoints, solution value can clearly be evaluated by the customer better than with functional value(Vargo and Lusch 2004).

Type 1: Lean-Service Model

KBS requires frequent interactions with the customer in order to co-create the knowledge product. By understanding the application scenarios of the customers, enterprises will be able to provide a total solution when customers actually demand knowledge-based service.

Based on the lean service process model proposed by 小菅竜介 (2009), this study combines both the

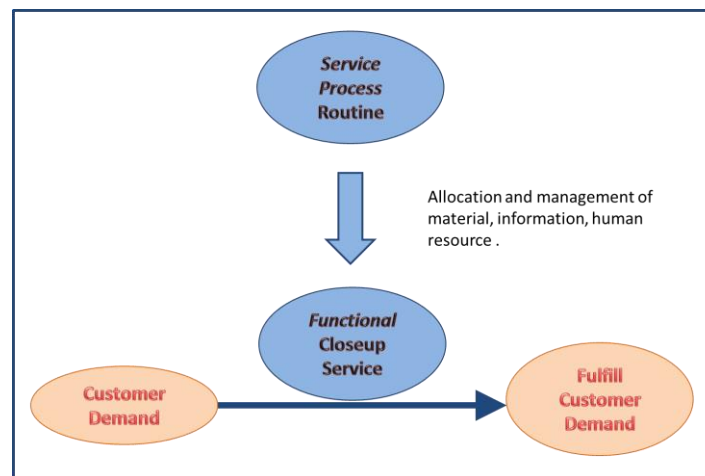
knowledge-based service process and the concept of customer value, and presents two types of lean models.

Type One model comes from the existing concept of lean service, considering knowledge service characteristics and developing an analysis framework for lean service. We call this LS Model, short for Lean-Service Model and illustrated in Figure 2.

LS Model is going to pack knowledge into an apparent module so the knowledge and service process can be followed and repeated. By SOP for the service process, each trained employee can utilize this module to quickly provide the service to customers. Customers do not need to be involved in the knowledge production or service process. Instead, they can evaluate and choose freely from the open market purely by how much the product costs and by a subjective judgment. Also, customers can use the product to determine the benefits by themselves.

When the customer has a request for such a product, an enterprise can apply the LS Model to reduce the waste in the service process, speed the tangible knowledge product to meet the time-to-market requirements and decrease customer waiting time for the knowledge service.

Figure 2 : Lean-Service Model, LS Model



Source: modified from 小菅竜介 (2009)

A KBS enterprise can adopt the following five characteristics of customer knowledge flow (See Table 4) to determine if it is a Service Process and can therefore apply the Lean-Service Model to fulfill the demand and to bring the functional value.

1. Discrete knowledge

Discrete knowledge is knowledge that can be obtained without frequent involvement. Both KBS enterprises and customers can clearly define the core purpose if its knowledge demand. Such knowledge content can be designed and planned by the KBS enterprise itself and a product can be provided to fulfill the demand of the end customer without having required long-term involvement of the customer.

2. Non-human embodied knowledge

Non-human embodied knowledge can be delivered without having face-to-face contact. When the customer raises a knowledge demand with the KBS enterprise -- it can come through a phone call, an e-mail, or via website -- and it is essentially a technical support request. The technical team can provide the knowledge-based service right away. Take on-line book stores and expert systems for example: The

KBS provider can interact with customers and quickly fulfill their demands through a web system.

3. Explicit knowledge

Explicit knowledge is easily understood. When the customer raises a knowledge demand to the KBS enterprise, its technical support team can simply present the knowledge in the form of a written document, proposal or other static result and show it to the customer. That knowledge can be adopted and utilized by the customer easily and can fulfill customer needs. The same knowledge can be repeatedly offered to other customers with the same need.

4. Contractual knowledge

Contractual knowledge is the kind of knowledge that must be provided based on the content of the contract. The customer does not need to make any request and the KBS enterprise must provide the information and knowledge that are defined and written in the contract.

5. Standard knowledge

This knowledge product is standard and keeps the same specifications. Knowledge can become apparent by records, can be standardized after consolidation and can be repeatedly utilized for the same process or flow and then offered to different customers that request products with identical specifications.

Table 5 : Lean-Service Model (LS Model) Knowledge Flow Characteristic

Knowledge Characteristic	Description
Discrete	Can be obtained without frequent involvement
Non-human embodied	Can be delivered by indirect interaction
Explicit	Can be easily explained and delivered
Contractual	Must be provided based on the content of the contract
Standard	Provide the same specification and standard knowledge product

Type 2: Knowledge-Service Model

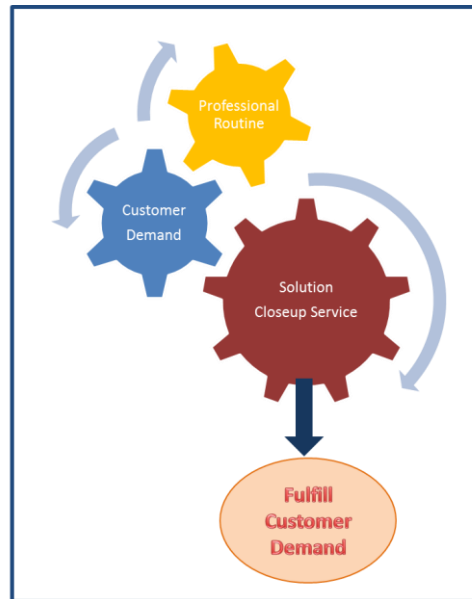
The Type Two model is based on the concept of KBS and built upon the two advantages in lean service: rooting out waste and creating value. This study calls this KS Model, short of Knowledge-Service Model. The analysis structure is illustrated in figure 3.

The KS Model embodies the knowledge in the process where an issue can actually happen in customer scenarios. It is a tacit perception, related to the application scenarios. the KBS enterprise must put itself in the customer's shoes in order to really understand what the customer has gone through in order to gain trust in, and from, the customer. As a result, the relationship between the KBS enterprise and its customer is indeed close, which is why the KBS enterprise is able to provide a total solution that is the best for the moment, and that is more useful than the end customer can come up with. Such is the solution value that is deemed subjectively by the customer.

When the customer raises a demand that cannot be explained specifically, the KBS enterprise will be able to follow lean thinking to reduce waste, which may be caused by information asymmetry or cognitive dissonance in the knowledge transfer process. As a result, tacit knowledge can be generated and provided much faster. Since the KBS team is able to collect useful information and has cultivated abilities to resolve issues by the service process, the team can promptly respond to customer demands, and is able to provide the necessary and correct product information. This also saves time and effort for

the customer.

Figure 3 : Knowledge-Service Model, KS Model



A KBS service enterprise can adopt the following five characteristics of customer knowledge flow (See Table 4) to determine if it is a Knowledge Process and can therefore apply the Knowledge-Service Model to fulfill the demand and to bring the solution value.

1. Process-Oriented knowledge

Process-Oriented knowledge is knowledge and experience that can be obtained with frequent involvement. When a KBS enterprise provides the information the customer demands, the customer must also take part in the process from the very beginning until the point when the service/product is finally available. Customers can collect and obtain knowledge and experience by this continuous process.

2. Human-embodied knowledge

Human embodied knowledge can only be delivered by constantly meeting and negotiating face-to-face. When a KBS enterprise provides the information the customer needs, both the KBS enterprise and the customer must meet face-to-face in order to have direct communication and negotiation, ensuring both sides have the same information and establish a consensus. Such mutual understanding cannot be obtained and consensus cannot be achieved by indirect communication. Human embodied knowledge is more critical in the KBS industry than in other service industries.

3. Tacit knowledge

Tacit knowledge is hard to explain and difficult to disseminate. When a KBS enterprise provides the information the customer demands, it is difficult to deliver conceptual or abstract knowledge. Such knowledge is hidden in the minds of both sides and can simply be subjective consciousness or some experience from previous activities, and thus can hardly be stored or delivered to customers.

4. Non-contractual knowledge

Non-contractual knowledge is a knowledge that is subtly leaked because of close interaction. Such

knowledge is usually the same as defined in contractual knowledge. When the relationship between the KBS enterprise and the customer is stable, such knowledge can be obtained without any obligation. Non-contractual knowledge is an additional value, based on mutual trust.

5. Non-standard knowledge

Non-standard knowledge is provided according to different scenarios. Service quality is decided heavily by the quality of human resource and internal training systems. Even the same employee cannot maintain the same quality when facing different scenarios and different customers. The experience of the employee plays another important role in service quality differences.

Table 6 : Knowledge-Service Model (KS Model) Knowledge Flow Characteristic

Knowledge Characteristic	Description
Process-Oriented	Can be obtained with frequent involvement
Human embodied	Can be delivered by direct interaction
Tacit	Can hardly be explained and delivered
Non-contractual	Provided based on the close interaction
Non-standard	Provide knowledge service depends on scenario and flexibly

Based on the LS Model and KS Model characteristic, this study categories lean KBS Model by LS Model (Lean-Service Model) and KS Model (Knowledge-Service Model), as illustrated in table 7.

Table 7 : Value creation in Lean KBS Model

Type	Lean-Service Model	Knowledge-Service Model
View Point of Lean	Lean service process oriented	Knowledge service process oriented
Interaction process	Reuse knowledge and process	Real-time and closeup
Knowledge Flow Characteristic	Discrete Non-human embodied Explicit Contractual Standard	Process-Oriented Human embodied Tacit Non-contractual Non-standard
Customer Value	Functional	Solution

The LS Model can be described as a KBS enterprise packaging the knowledge to be an explicit module and then delivers it into the hands of customers via a tangible knowledge product. When the customer raises a demand for such knowledge, it usually comes with time effectiveness. The KBS enterprise would apply the same knowledge and flow repeatedly during the process in order to quickly provide the knowledge product with functional value.

The KS Model embodies the knowledge into the process of delivering a total solution by intangible and

close-up interaction in a real scenario in which the customer is experiencing an issue. When the customer raises a demand for such knowledge, it usually aims at a certain purpose of learning. The KBS enterprise needs to have close interaction with the customer in order to identify the real purpose of the demand. A KBS enterprise must also select employees with sufficient professional knowledge to interact with customers in the lean KBS service model in order to provide a total solution to customers with solution value.

Implication for Lean KBS Model

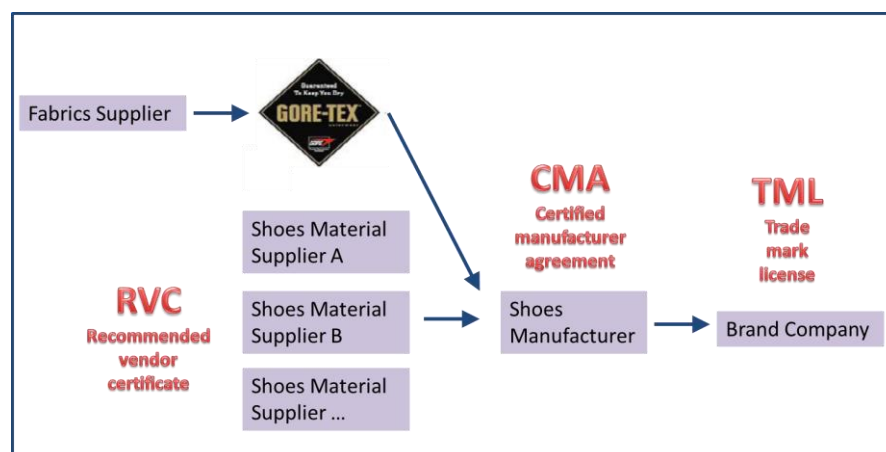
W. L. Gore & Associates was founded in 1958 by creating innovative, technology-driven solutions, from medical devices that treat aneurysms to high-performance GORE-TEX® fabrics. Gore is a privately held company with annual sales of more than \$3.2 billion, and is listed by Forbes as the 134th biggest private company in the United States in 2011.

Gore is committed to perpetuating its 50-plus year tradition of product innovation. Gore's most famous product, GORE-TEX® fabrics, is "high-performance copper and optical signal transmission products." In 1980, Gore started to make shoes with GORE-TEX® fabrics and took the idea to include socks inside of the shoes and promised its customers the product was "guaranteed to keep you dry." As a result, Gore must adopt a special business model to closely work with its partners in order to provide qualified product, and be dedicated to cooperate with distributors and retailers to resolve any issue that customers may experience. This study will demonstrate the interaction among the Gore shoe department, its distributors, retailers and its vendors.

Gore certification process

Gore manufactures GORE-TEX® thin film and fabrics as a typical intermediate-good for shoe factories to use. In order to ensure the quality of the final product Gore, based on the partnerships, established a product certification process. The Gore certification process includes RVC(Recommended Vendor Certificate), CMA (Certified Manufacturer Agreement) and TML (Trade Mark Licensing). By applying this certified mechanism, Gore includes shoe supplier chains as partners, which becomes a semi-closed system. The Gore cooperative flow chart is shown in figure 4.

Figure 4 : Gore Co-operative flow chart



RVC (Recommended vendor certificate)

The making of a shoe requires various materials and it takes shoe manufacturers to process the material before assembling them as final footwear. Because the number of materials is so vast, the number of

vendors is also numerous. Gore therefore setup RVC to establish the standard of shoe material examination which shoe material vendors must follow. Once the vendor passes the examination, Gore will include its name on the approved vendor list for shoe manufacturers to choose from. In 2002 Gore started the idea of an approved shoe material vendor list. It was not until 2008, however, that Gore held the first RVC meeting and invited all the RVC vendors, and some branding shoe makers, to form this cooperative platform. The purpose is to increase the operation and trust among the partners through intensive communication and training. Gore, however, does not set any compulsory policy but only encourages vendors to take the initiative to send their material to Gore's Lab, promising that once the examination result is positive, their name will be put on the RVC list.

CMA (Certified manufacturer agreement)

CMA is the certificate especially designed for shoe manufacturers. Gore will give CMA certification to a shoe manufacturer after it has passed Gore's examination. Only the manufacturer with the CMA certificate is allowed to manufacture GORE-TEX® shoe products. Certification is awarded based on factory location rather than the enterprise's mailing address.

When a branding shoe company has a demand and asks Gore for product, Gore will screen the existing CMA list to see if there is any shoe manufacturer that is able to fulfill this demand, whether the demand is an order or a shoe model. After confirming the demand with the branding shoe company, Gore will take a closer look to see if any of the CMAs are able to process the order or manufacture a certain shoe model. If Gore determines that no vendor on the CMA list is qualified, Gore will invite the new shoe manufacturer to become the CMA manufacturer. Whenever Gore evaluates a CMA candidate, it will closely examine whether or not the production environment of the shoe manufacturer is up to the Gore standard. After the shoe manufacturer is approved by Gore and signs a contract with Gore, it will become a bearer of the CMA. The contract includes the first year quantity and the margin. If a CMA manufacturer violates Gore company policy and fails to pass the quality check, Gore will invalidate its certificate and remove it from the CMA list.

After awarding certification, Gore will continue to supervise the CMA manufacturer and to provide necessary assistance. Gore also will provide equipment for the CMA manufacturer to make and test lining.

TML(Trade mark license)

TML is mandatory for those branding companies who want to retail GORE-TEX footwear. Among the 150 branding companies who have acquired TML, many are the popular brands known to world-wide customers such as Salomon, Marrel and Ecco. GORE-TEX® fabrics are designed for outdoor footwear, however, its water-proof and breathable nature has made it a reasonable choice for leather shoes in order to add value.

The Gore marketing department evaluates and identifies qualified branding companies and then takes the initiative to contact them to see if they are interested in becoming a TML. After both sides have confirmed the cooperation and business terms, Gore will certify those branding companies, allowing them to become official partners. Gore also will request those branding companies to present solid business plans to include investment plans and marketing approaches.

The above mentioned information is mainly based on Gore training material.

GORE-TEX® Trainer

In order to help its customers (shoe manufacturers and branding companies) to better understand the outstanding features of GORE-TEX water-proof and breathable products, Gore will periodically host a three-day GORE-TEX[®] training event to introduce fundamental and professional knowledge. The purpose is to train customers to become a seed so they can introduce Gore products to their own employees, and so they understand what it means to become a GORE-TEX certified vendor and branding company.

The concept of the GORE-TEX[®] pro footwear training camp was proposed by its Asia footwear technical consultant team in 2005. To remain competitive, they suggested Gore must assist its supply chain to become competitive by leveraging its outstanding technology. Gore has helped its certified partners increase the quality of Gore products and to lower production costs. By intensively interacting with its certified partners, Gore has co-creation value with its partners.

To achieve the goal, the members of the Gore footwear technical consultant team started to document their professional knowledge and technology-related information and turn this into a global footwear manual (GFM). The GFM is used as the GORE-TEX[®] pro training material and has been uploaded to the Gore Intranet for certified partners to download via individual accounts. There are currently over 30 technology documents for various categories.

Each GORE-TEX[®] Trainer spans three days and each certified partner sends six to eight employees to attend the training course. Gore will break them into different groups so they can share with one another about the specialty of his or her profession or brainstorm together in various designed activities. Each team is led by one of Gore's employees to learn about the Gore company culture, Gore product knowledge, Gore's production technology, upper material knowledge and organizational change philosophy.

During the GORE-TEX[®] Trainer, Gore not only introduces shoe-related knowledge, but also emphasizes production flow and how machine operation in the Lab tour. At the same time, Gore emphasizes its corporate culture and the importance of leadership using group discussion and group activities designed to help people to learn to share and cooperate.

Besides the GORE-TEX[®] Trainer, Gore also visits its certified partners to discuss product development. By seeing the live testing and product development flow, Gore intends to share and discuss potential issues and hopes to find a solution immediately.

After seeing the GORE-TEX[®] Trainer having a positive affect and receiving recognition among its branding partners, Gore continues to host more GORE-TEX[®] Trainer events in Asia and is now starting to host more events in Europe and the United States.

During the long-term knowledge-based service, Gore finds qualified vendors and help them grow. In this process, Gore anticipates that long-term development will lead to long-term success. The power of mutual understanding not only brings Gore and its certified partners closer but also increases the value of its product. And by sharing the knowledge, Gore has successfully developed long-term partnerships with its certified vendors. To its certified partners, Gore is not only a brand but also a knowledge and technology partner, and such long-term trust allows partners to willingly cooperate with Gore.

Based on analysis of the two models above, we can see that Gore leans toward the KS models, as illustrated in table 8.

Table 8 : Gore's Lean KBS Model

Type	Lean-Service Model	Knowledge-Service Model
View Point of	Lean service process oriented	Knowledge service process oriented

Lean				
Interaction flow	Reuse knowledge and process		Real time and closeup	
Knowledge Flow Characteristic	Discrete		Process-Oriented	●
	Non-human embodied	●	Human embodied	●
	Explicit	●	Tacit	▲
	Contractual	●	Non-contractual	▲
	Standard	●	Non-standard	▲
Customer Value	Functional		Solution	

PS. ● stands for total match and ▲ stands for imperfect match

Discussion

The nature of service process

The knowledge and process can be repeatedly applied and the KBS enterprise can interact with customers by delivering the explicit knowledge. It does not require long-term or close-up interaction but still brings satisfaction to customers. This is because the knowledge product itself can fully meet the functional value expected by the customer. In a service process, the KBS enterprise service team can learn about the knowledge of the product via internal training and is able to demonstrate its advantage and unique qualities. The service team can also standardize such knowledge so the service can be provided in real time and in a systematic manner. The service team plays the role of knowledge provider and is supported by a massive knowledge database, which enables the service team to fully meet the demands of the customer.

The nature of knowledge process

In knowledge processes, knowledge is the main product and is not easily evaluated objectively. In the case study it is obvious that this enterprise depends heavily on professional knowledge. And since the knowledge is tacit, it requires long-term and closeup interaction between the KBS enterprise and the customer in order to provide a total solution that understands the customer better than the customer. Knowledge is the main factor in the service flow. In the KBS process, the KBS enterprise must be equipped with professional knowledge in order to provide service based on different scenarios. Besides visiting the customer and providing assistance (for example the Gore technical consultant team often visits its customer to provide problem solutions) the KBS enterprise must set up a platform to work with customers in order to discuss and resolve issues. For example, Gore hosts GORE-TEX® Trainer for customers to assist them in adopting professional knowledge and learn from one another during the entire course.

Interactive use of different flow

In the KBS process, interactive use of explicit knowledge and tacit knowledge frequently takes place and continues to have a knowledge spiral. Normally the value of the knowledge process is emphasized more than the service, and service is deemed as merely a media to deliver the knowledge. Nevertheless, the KBS process requires direct contact and face-to-face communication. This is a close-up interaction and is progress-oriented. And the interaction is much closer than in general service. The customer

needs to have a contract with the KBS enterprise first, before it can enjoy the benefit of the functional value and develop enough trust to have further interaction with the KBS enterprise while receiving leaked knowledge. The nature of the KBS process is a result of interactive use of knowledge processes and service processes.

The Application of KS Model

Based on the Lean KBS model analysis, we found the KBS process tends toward the KS Model but also has some characteristics of the LS model. Even though this study is not fully verified by the LS model, it does not necessarily mean the LS model does not exist.

For the KBS process the KS Model is precious and belongs in the mainstream, however, based on the case study, it still shares some characteristic of the LS model. And the explicit knowledge, contractual knowledge and standard knowledge all can help increase the efficiency of the KS Model.

The KS Model presents knowledge in a sequence of service and closely interacts with the customer in real time to create value. In order to truly understand the customer's point of view, the KBS enterprise needs to be where its customers are, in order to fully comprehend the tacit scenarios and experience of customers. But, based on the case study, it also shares the nature of explicit knowledge. KBS enterprise can externalize its professional knowledge by providing written documentation to help customers gain basic knowledge in order to increase the tacit knowledge flow efficiency. For example, Gore provides basic shoe knowledge (GFM) to its customers to ensure there is a foundation for their communication in case issue happens in the future.

Also, based on the case study, the key for both sides to having close interaction is by establishing a stable relationship first, before there is any chance for innovation or knowledge transfer. Based on the explicit knowledge and contractual knowledge, by providing SOP, the KBS enterprise is able to clarify standard knowledge service in order to resolve issues that can hardly be described or illustrated. For example, Gore provides SOP to its customer first to ensure the quality of the production. If an issue arises that cannot be identified in the SOP, a Gore technical consultant team will visit the customer on-site to provide a solution.

As illustrated, the nature/characteristic of the KS Model not only includes process-oriented knowledge, human-embodied knowledge, tacit knowledge, non-contractual knowledge, and non-standard knowledge, it also includes the LS Model's explicit knowledge, contractual knowledge and standard knowledge. To summarize, the KS Model not only provides service/solution that understands the customer better than the customer; it also requires explicit knowledge to increase the efficiency of the knowledge flow.

Based on the case study, this study determines that the KS Model should adopt both a service process and knowledge process in order to provide both solution value and functional value at the same time. The nature and revised content of the KS Model is illustrated in Table 9.

Table 9 : Value creation of KS Model

Type	Knowledge-Service Model
Value Process	service process & Knowledge process
Value Creator	KBS enterprise and customer
Value Evaluate	customer objective perception
Value Content	Process-Oriented

	Human embodied
	Explicit & Tacit
	Contractual & Non-contractual
	Standard & Non-standard
Customer Value	Functional & Solution

Conclusion

KBS service flow includes both “service process” and “knowledge process.” Its service content can be divided into “explicit knowledge” and “tacit knowledge.” The tangible product of a KBS enterprise usually does not have too much distinction; therefore, the tacit knowledge flow will become the main differentiation.

During the “service process,” knowledge is packaged as a tangible product. Therefore, what customers want is to quickly and correctly obtain the knowledge product, and know whether the function the product provides can meet their need. In the “knowledge process” customers only want to enjoy the basic function of that product, but also want to enjoy the learning process. Therefore, knowledge is embedded into a series of services. KBS enterprises would get as close as they can to understand the needs of customers in order to provide a total solution.

Generally speaking, the KBS process is a kind of service activity that provides both explicit and tacit knowledge that focuses on fulfilling customer demands.

Theoretically, this study presents two knowledge-based lean service models: the LS Model and KS Model. However, based on the case study, we discover that, in the process of KS Model’s interaction, its nature and its value content also fits the profile of LS Model.

The KBS enterprise packages knowledge in the process where customers are having issues. Its purpose is to provide a professional solution that understands the customer better than the customer does, in real time, by standardizing professional skills. Therefore, a lean KBS process model is adopted to create value. However, in its operation, it still requires the nature of an LS Model to externalize part of the knowledge in order to improve efficiency. The value content of the KS Model includes process-oriented knowledge, human-embodied knowledge, tacit knowledge, non-contractual knowledge, and non-standard knowledge. It also includes the value content seen in the LS Model: explicit knowledge, contractual knowledge and standard knowledge. It provides both functional value and solution value to the customer.

This study tries to present the fullness of each critical topic, however, limited by time and ability, the following topics do require further study for those who are interested in finding an answer.

1. In the lean KBS process application model, only one enterprise is selected. A second or more KS-type enterprises can be examined in order to solidify this study.
2. This study presents partial discussion of the LS Model; it does not suggest the LS Model does not exist. Perhaps this can be discussed in the future.
3. In a knowledge-based service process, one must keep performing the knowledge spiral, initiating application, transfer and creation; this could be the key to forming KS Model knowledge. Further study would be required.

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