GAINING STRATEGIC BALANCE BETWEEN INIMITABILITY AND LEGITIMACY IN GENERATING INNOVATIVE BUSINESS MODEL

UDK: 65.011.1:338.45](520) / JEL: L22 ; L74 / PRELIMINARY COMMUNICATION

HAJIME KOBAYASHI
PROFESSOR
hkoba@kisc.meiji.ac.jp

MASAAKI TAKEMURA
PROFESSOR
takemura@meiji.ac.jp

YORITOSHI HARA
PROFESSOR
hara@kisc.meiji.ac.jp

FOR AUTHORS:
SCHOOL OF COMMERCE,
MEIJI UNIVERSITY
TOKYO, JAPAN

ABSTRACT

This work analyses a case of Japanese construction equipment company as a successful introduction of new business model as servitization process in traditional manufacturing industry. Servitization is defined as a phenomenon in which services are occupying a larger part of the added value in customer offerings (Vandermerwe & Rada, 1988). Servitization in the manufacturing company often requires radical business model transition. Business model must be contrived which can be characterized by several design themes and design elements (Zott & Amit, 2009).

The design themes capture the common threads that orchestrate and connect the focal firm's transactions with external parties. These contribute for customer's profit to deliver efficiency, lock-in, reciprocity, and novelty. The design elements involve transactional content, structure (activity links), and governance with other stakeholders.

Novel business models refer to new ways of conducting economic exchanges among various stakeholders that could lead to inimitability. Less strategic similarity through servitization design could increase differentiation and inimitability. However, novel business model innovation also requires more strategic similarity as legitimacy for its diffusion and social acceptance. Low legitimacy diminishes the ability of a firm to acquire resources from potential exchange partners in the business model. Legitimacy challenges occur because the firm's servitization strategies reject the conventional wisdom that is incorporated in the industry consensus. As a result, adopting novel design themes and elements needs to balance between inimitability and legitimacy and generate moderately novel configurations of design elements (Deephouse, 1999, Snihur & Zott, 2013).

Prior research findings on servitization emphasized on mainly efficiency as a design theme and product-service system's contents as a design element, based on static empirical studies. As the methodology, we adopt more holistic and dynamic view of servitization phenomenon in this paper. Our research focuses on the issue of strategic balance in a Japanese company in terms of design themes and elements of servitization business model.

KEY WORDS: instagram, food, social eater, social media marketing, impression management.

1. INTRODUCTION

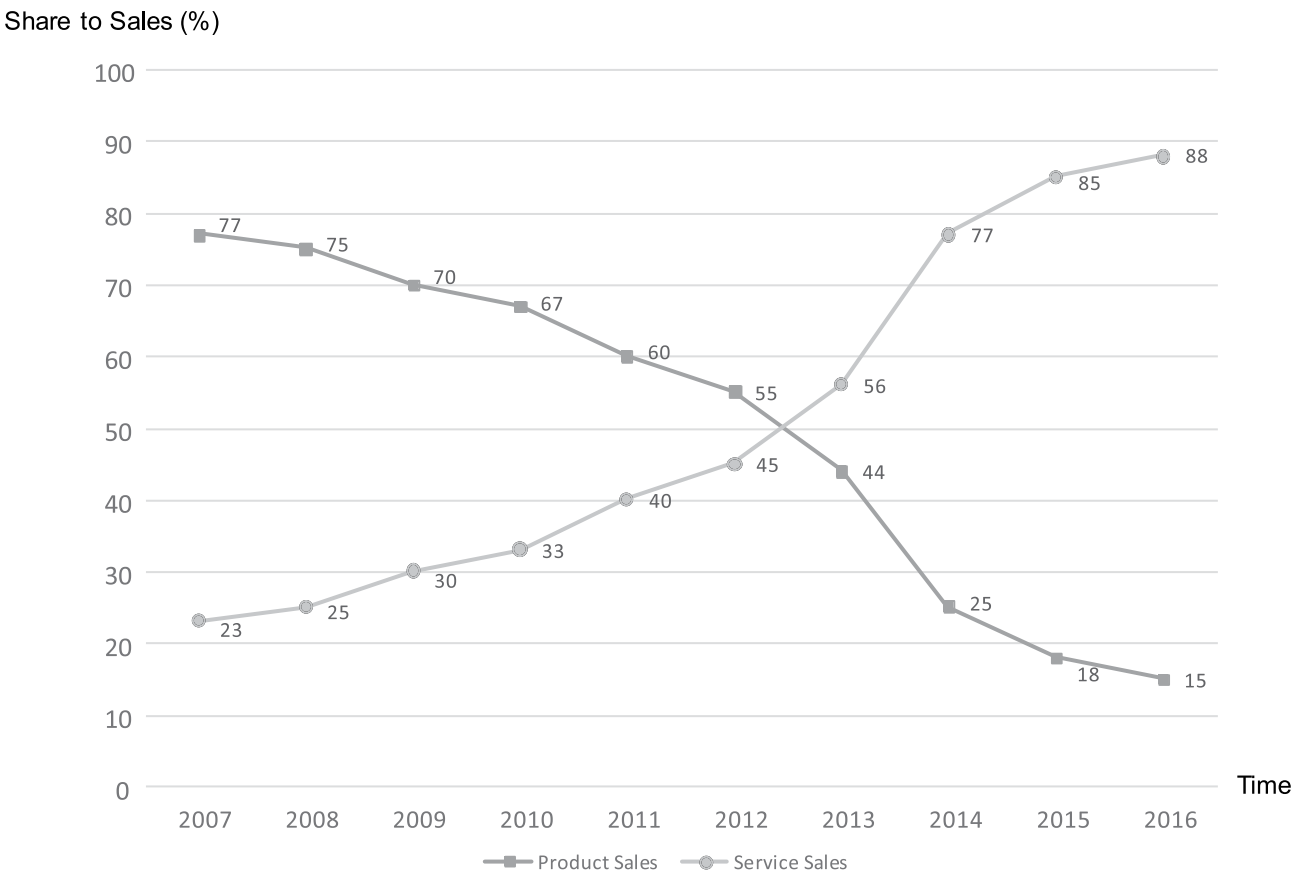
The purpose of this study is to show some managerial notices on servitization process by showing a case of Japanese construction equipment manufacturing company. It has been known that servitization is one inevitable imperatives in highly developed economies because value of goods is getting decreased in such economies. Manufacturing companies should better to find another way to profit. The way is servitization. This case suggests that servitization is better to analyse as a business model analysis.

Servitization is defined as a phenomenon in which services are occupying a larger part of the added value in customer offerings (Vandermerwe & Rada, 1988). In short, it can be said that servitization is the transition process in which profit contribution has been getting shifted from product selling to service providing in a manufacturing company. There are companies, which add peripheral service such as maintenance and repair and rental, integrating product and service, and even completely shifting from a manufacture to the solution service company. Servitiazation process inevitably occurs under highly developed

capitalization circumstances. Such circumstances are basically characterized by changing relative cost structure in manufacturing sector in the world. Under this condition, a product rapidly decreased its substantial value because country with relative low (labour) cost also can produce competitive (actually alternative) products. This sometimes is called commoditization.

Typical case of servitization can be seen in a computer manufacturing company. Through intensive work on computer manufactures by Cusumano (2004), he revealed that all companies tended to shift their business focus from products to software. According to their findings, Suarez, Cusumano, & Kahl (2013) reported that manufacturing firms (product firms, in their paper) switched the focus on services in which their performances reached an "inflection point". Inflection point, here, means a certain point where the contribution to performance of additional services changes from negative to positive. They estimated that to happen when services reach approximately 56% of a software product firm's total revenues. His findings can be abstracted as Figure 1.

Figure 1. A conceptual scheme of abstracted servitization process



Source: Abstracted by Authors based on Cusumano (2004)

Figure 1 is an abstracted example. It is constructed by two axes. A horizontal axis refers to time. In this time, the axis depicts years since 2007 to 2016 as the example. A vertical axis refers to share to sales, in general. In detail, this shows two shares of sales: share of product sales to total sales and share of service sales to total sales. This figure implies that product sales share is getting decreasing since 2007 to 2016. Specifically, when share of service sales reached approximately 56% in 2013, its share rapidly increased.

Many successful cases on servitization have been reported, and several conceptual frameworks as well. However, these discussions implicitly are assumed that servitization can be achieved easily. Or, at least, the process of servitization can be planned and managed rationally. In this paper, through a case study of Japanese company, we will point out some other discussions. Our case study will treat with Komatsu Company, the second largest construction equipment manufacture in the world. Now Komatsu is known as one of the leading companies which developed and introduced IT maintenance service in construction equipment industry. Therefore, there are a lot of successful anecdotes about Komatsu, and highly applauded it.

Compared to these applauses, this paper will point out the difficulty of transition toward servitization, namely, business model transition. Because differently from theoretical recognitions of business model, practical business model operations always encountered some resistances and oppositions, even interruptions. Although business model studies have been conducted many times, seldom negative assertions of business model studies with some empirical evidences have been insisted on, not only an empirical study, but also a case, so far. This is the reason that it will be better to focus the business model studies on these managerial difficulties should be research focus.

As the evidence, there were few persons who could understand competitive meaning and importance about IT maintenance service in the beginning of introduction, even in Komatsu's director board. To understand this transition difficulty, this paper will develop a conceptual framework. Furthermore, this paper suggests the difficulty why servitization is difficult. Some difficulty stems from strategic balance between novelty and legitimacy of business model. As explained later a few more details, servitization inevitably accompanies with business model innovation. Here, innovation means new combination of something in the company (Schumpeter, 1912/1934). Business model innovation is characterized by design theme, which describes the patterns of design elements. Mainly managerially and economically, or it can be said, sometimes politically within the organization, design theme seldom worked as originally planned. Rather it can be regarded as the continuous substantiation process by the evidences.

To achieve this purpose, it is better to organize this paper as follows. First, related previous studies will be reviewed. Specifically, frameworks and definitions of servitization and business model studies shall focus on in section 1. Second, to share the business conditions and situation in Japan, a case study and related methodology will be introduced in section 3. The case study here treats with Komatsu LTD (hereafter, Komatsu). Komatsu is one of the leading construction equipment manufacturers in the world. This case study is not only interesting as the case itself, but also theoretically challengeable. Then, findings and theoretical interpretations will be discussed in section 4. In section 5, we will discuss on some findings from the case with the analytical framework. In turn the last section 6, we will conclude the findings and our discussion.

2. RELATED PREVIOUS STUDIES

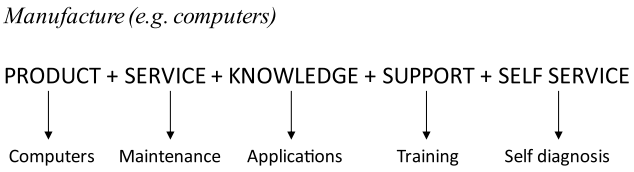
This section will discuss on some frameworks and definitions. Though we focus on the difficulties of servitization process, recent several servitization theme employed successful cases and discussions. Of course, business related papers, even for a pure theoretical one, are required to show some managerial implications. At that time, it is easy to understand for showing successful cases as managerial lessons. However, failure became a mother of success, failure includes as much lessons as successful cases do. At least, we will able to suggest some difficulty to transform a servitization company.

2.1. Framework and definitions of Servitization

Servitization for a manufacturing company has been suggested since early 1980s. Some early studies on this theme indicated and classified the differences and similarities between products and services. As one of the earliest works, Shostack (1982) suggested product/service combinations by the molecular modelling approach. The molecular modelling approach was a description method which separated product and service elements, respectively, from an entity. Here, the entity means, actually, a product, but he connoted it as a total physical object with some function. Through conceptualized by molecular modelling approach, the entity can be decomposed by physical elements and functional elements (these are actually service offerings). For example, an automobile can be decomposed by three elements: a vehicle and options and extras as the product; transportation as a service element. Thus, this method can create the essential evidences which are yielded by the entity. Though he emphasized on product/service combinations, there still remained managerial method how it achieved.

Vandermerwe and Rada (1988) was one of the earliest works on servitization. They not only insisted on service offering with product as inevitable way, but also showed servitization contents. According to their opinions, servitization was consisted of five elements (module in their term), goods, services, support, knowledge, and self-service. Goods is the hardware. In orthodox business model, a manufacture produced this hardware and sold it. Then, it earned sales and gained profit. People believed that hardware as goods contained value for money as sales and profit. Services are intangible value for customers through using hardware. Support is additional offerings to use hardware and services. The support sometimes helps hardware use effective. Knowledge refers to know-how for using hardware. Customers inevitably leant what the hardware was for through using hardware. This sometimes is called an application of hardware. A glass is not only for drinking water, but also a vain for flowers. And the last one is self-service. Self-service is the result from the support and knowledge. Customers are getting accustomed to use the hardware. They can use it as more than the original hardware. These elements can be described as an example as below (Figure 2).

Figure 2. A servitization example



Source: Vandermerwe and Rada, 1988, p.317, Figure 1

However, an important thing for this paper and real business management is to know what is successful transformation and how it is possible. Reinartz & Ulaga (2008) described this transformation process. Their model included four steps. The first one was to recognize service offerings in the products. Many manufacturing companies have already delivered services, but few realized. The second one was to make the back office (industrialized, in their term). Here, the back office means to make service production processes. Important is that, here, this production processes might notice on over customization. The third one was to organize

a sales force. Here, the sales force should be service-savvy organization. For this, to make incentive systems that promote service sales are effective. And, the fourth one is to focus on customers' processes. This process would be completed by having detailed descriptions of core customer concerns and operating processes.

Though Reinartz & Ulaga (2008) successfully formulated servitization from the manufacturing company, there were still some questions for practical servitization processes, otherwise no company failed. Indeed, it is not true. Servitization is not easy work. Ulaga and Reinartz (2011) suggested how manufacturing companies could combine goods and services successfully. They focused on management resources (capabilities in their term). Here, management resources in their meaning were referred to the abilities which could develop to generate the combined offerings (hybrid offerings in their term). Through 22 interviews to key decision-makers in manufacturing companies on organizational activities to develop hybrid offerings, they summarized mainly five distinctive capabilities: service-related data processing and interpretation capability, execution risk assessment and mitigation capability, design-to-service capability, hybrid offering sales capability, and hybrid offering deployment capability.

Although above formula seemed to suggest with successful servitization process, we still know several unsuccessful cases and difficulties for servitization process. Recently, it is known as business model transformation (sometimes innovation) of organizations. Because there are a lot of differences of organizational structures between manufacturing and service companies, respectively (Hagel & Singer, 1999).

2.2. Framework and definitions of business model innovation

Business model is traditionally defined as an abstract representation of an organization, be it conceptual, textual, and/or graphical, of all core interrelated architectural, co-operational, and financial arrangements designed and developed by an organization presently and in the future, as well as all core products and/or services the organization offers, or will offer, based on these arrangements that are needed to achieve its strategic goals and objectives (Al-Debei, El-Haddadeh, & Avison, 2008, pp.8-9).

However, such general definition often is not only manageable, but also difficult to understand the differences from standard and normal business practices. Most companies did so, do so, and will do so. Thus, the time can be traced back to early 1980s to find this kind of business model and similar concepts (Porter, 1985). Though business model focuses on several linkages among stakeholders around the focal company, Porter's value chain analysed several functions within a company.

Compared to such general definition, we focus on, rather, more manageable and even operational definition because this paper will adopt with a practical case study. This case study can provide complement lessons on the conventional business model understandings. Slywotzky & Morrison (1997) introduced 22 manageable and operational business models (business design in their term). According to their opinions, the business model referred to profit-centric configuration of organizational elements. They emphasized that business design had to specify these four elements: customer selection, value capture, strategic control, and scope (Slywotzky & Morrison, 1997, pp.10-11).

The customer selection describes the company's chosen customer set. They implicitly assumed that a company did not define their profitable customers, and sometimes it might be true. Even though, there were few companies which positively define that who would be their profitable customers. Or, it can be said, there are still rooms to improve the profitable customer definition technique. The value capture describes how the company gets rewarded for the value it creates for its customers. This becomes a way to create new, or additional, profit sources. Today, manufacturing companies can employ a more extensive repertoire of value capture mechanisms than they ever had before: financing, ancillary products, solutions, downstream participation in the value chain, value sharing, and licensing and so on. All these methods will become one of the cues of servitization. The strategic control refers to the company's ability to protect its profit stream. It answers the questions: "Why should a customer buy from our company? Why must a customer buy from our company?". Strength of this element becomes a critical in successful business model innovation. And the last, the scope of a business model refers to the company's activities and its product and service offerings. Here, scope means (numbers of) company's activities, or traditionally, this has been said "make or buy" decision.

Slywotzky & Morrison (1997) told us that there were several ways to organize profitable methods by above four elements, but their models was established by current business model analysis, namely, these models seems like to encourage any business models can be profitable, even if the models were accompanied with their models.

This paper will, rather, suggest on the difficulties of transforming the business models, especially a manufacturing company to a service company. For above discussions, this can be learnt, that is, business model is not merely the configuration of organizational elements, rather, the continuous renovation of organizational elements to the selected profitable customers. Therefore, the discussion about business model must include articulated explanations why the company becomes profitable.

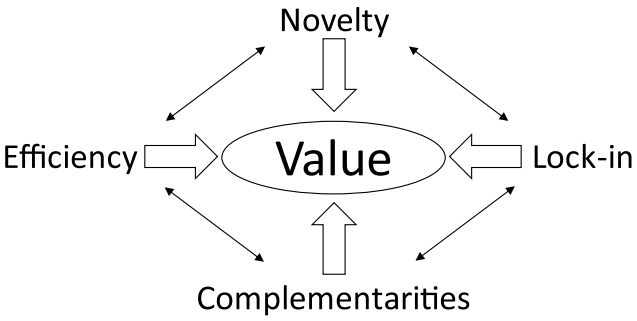
2.3. Conceptual framework of this study

Here, to show difficulties of organizational transformation, we will employ a dominant business model framework. It can show rigidity and inertia of the organizations. Zott & Amit (2009) emphasized that business model could be regarded as value generation system for customers. They conceptualized this delivery system as an activity system. Here, the activity system means a set of interdependent organizational activities centred on a focal firm, including those conducted by the focal

firm, its partners, vendors or customers. The firm's activity system may transcend the focal firm and span its boundaries, but will remain firm-centric to enable the focal firm not only to create value with its partners, but also to appropriate a share of the value created itself. This conceptualization seems to ask us the unit of analysis, namely, shift from product and service selling to all over the linkages around the focal firm.

Based on this activity system perspective, they emphasized to design the business model. To design, here, means to assign the elements which are consisted of activity system. To some extent operationally, their model can be described by two sets of parameters that activity systems designers need to consider: design elements (content, structure and governance) that describe an activity system's architecture, and design themes (novelty, efficiency, lock-in, and complementarities) that describe the sources of its value creation. Novelty involves introducing new elements related to activities, actors, and/or linkages. Efficiency builds interdependencies for lean operations, minimal costs, and/or low coordination costs. Lock-in refers to business models that emphasize retention of activities and actors. Complementarities involve the bundling of activities and/or linking of specific actors such that the system is bigger than the sum of its parts (Sorescu et al., p. S6). Their model can be abstracted in Figure 3 below.

Figure 3. Four design themes of business models

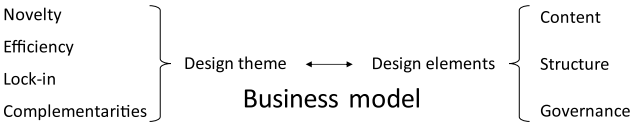


Novelty	New transaction structures, New transactional context, New participants
Efficiency	Search costs, Selection range, Symmetric information, Simplicity, Speed, Scale economies
Lock-in	Switching cost, Loyalty program, Dominant design, Trust, Customization, Positive network externalities
Complementarities	Between products and services for customers, Between on-line and off-line assets, Between technologies, Between activities

Source: Amit & Zott, 2001, p.504. Figure 1. Changed description in the table.

Figure 3 shows four types of values for customers. According to this framework, customer recognized four types of value from a specific business model. Most of them are persuasive. Here, more important, though, they did not articulate relations between business model design themes and design elements, in Amit & Zott (2001), here we can suppose these relations (Figure 4).

Figure 4. Relations between design themes and design elements



Source: Authors.

Figure 4 suggests that rigid relations between design themes and design elements. This frame tells a certain design theme requires one related design elements. For example, efficiency design theme can be achieved when it realizes cost reduction (by scale of economies, speed, and rationalization and so on). Although Amit & Zott (2001) did not articulate what design elements were at that time, later their opinion was clear: orchestration (Zott & Amit, 2007, p.183). Here, orchestration means matching, namely, design elements work if design theme matches them. Thus, Zott & Amit (2010) conducted am empirical survey for business model performance.

However, their survey model focused on mainly design theme: efficiency and novelty, as independent variables. On the other hand, a dependent variable was a firm's stock market valuation, but this indicator was measured by multiple measurements: profitability (ROI, ROA) at various time periods (annual average, average during Q4, and the last day of trading of Q4). As the result, design novelty significantly influenced firms' performance in 1999, and design efficiency was also significant in 2000.

Their conclusion was important to business model research, generally, but these results were not important here. Rather, it is better to indicate that the model implicitly includes the orchestration assumption. Their empirical model apparently misguided their original model above Figure 1. Actually, they were getting preferred to focus on just design theme. In recent their works, they focused on elements of design themes which worked as each design theme. As the evidence, Zott et al. (2011) collected 1,253 business model related articles. Through an initial cursory analysis of 103 articles from above population, they summarized that business model, at least, has been used by three themes: e-business, value creation strategy, and innovation and technology management studies, respectively. In their summary, there is no discussion on design elements any more.

However, their basic model supposed that orchestration between design theme and design elements could achieve high performances. Here, our case will mainly be based on their original model. This article will describe Komatsu's case as following this original model.

3. METHODOLOGY AND THE CASE

This section will discuss on research method and our case. Our study mainly focuses on showing new findings, or it can be said, it will not be orthodox understanding from dominant perspectives. Rather, it will be expected polemic and controversial. Because the case will show some difficulty of business model transition. Here, first the methodology shall discuss. Then, a company profile and the case will be introduced in next part.

3.1. Methodology

To show the purpose, we conducted a case study. Here, the case study means Yin's (1984) seminal work. According to his opinions, the case study would be appropriate under these conditions, such as theory building stage in which little data. In this article, rather, our case meets the criteria for an "extreme case", one in which the process of theoretical interest is more transparent than it would be in other cases (Eisenhardt, 1989).

Related to "extreme case", but if any, more important research purpose can be indicated. Our case must be a crucial case. The idea of crucial-case studies was introduced by Eckstein (1975). He argued positive contribution by a case study as a scientific research method. Additionally, the crucial "case that must closely fit a theory if one is to have confidence in the theory's validity, or, conversely, must not fit equally well any rule contrary to that proposed." (Eckstein, 1975, p118). The crucial case can be employed both for hypothesis testing and development of a hypothesis, even it is single case.

With regard to hypothesis testing, we can suggest democracy and economic development in China as the crucial case. Generally, according to the level of economic development, democracy is getting established. In this meaning, China is the crucial case for the theory of democracy establishment. In the same vein, India can be the crucial case for democracy theory against China. India maintained high level democracy, even it was still low economic development period. However, it is better to recognize that the crucial case does not work as hypothesis testing rigorously and precisely. Indeed, King et al. (1994) strongly criticized hypothesis testing by single case observation, as scientific meaning. Even it is the crucial case, that can be useful to modify the hypotheses, or to add some conditions to hypotheses.

Furthermore, we recognize that a case study, not only a crucial case, but also a case study in general, contributes to understand a mechanism of causal relations. Academic rigorously said, statistical test does not probe the causal relation itself, even hypothesis has been significantly tested. Compared to statistical causal relations, our natural judgements prefer to know what elements work and interact in such causal relations. For instance, when people read a detective novel (story), readers convinced the causal relations when detailed inference and reasoning processes by a detective are likely persuasive. In that case, detailed each interaction among all elements in the story is more important than statistical causal relations.

3.2. The company profile

Komatsu Ltd. (hereafter Komatsu) was established in 1921 in Komatsu city, Ishikawa prefecture in Japan. It used to be a part of Takeuchi Kogyo (cupper mining company), as developing a mining machine since 1917. During the Mukden Incident, around 1931, Komatsu received many orders to produce machine tools and mining equipment, utility machines, forest machines, and industrial machines. In 1931, Komatsu developed the original first tractor for agriculture. In 1943, Komatsu developed the first bulldozer architype, and D50 in 1947. Accompanying with economic recovery in Japan after the World War II in 1945, Komatsu began to produce many varieties of machines: a motor grader in 1952, a forklift track and dump car in 1953, a tractor shovel in 1956, a tire dozer in 1965, and an excavator in 1968.

Since 1967, Komatsu found the first subsidiaries in Belgium, then established a distribution centre in Germany in 1981, and constructed factories in the UK in 1985 and in Italy in 1995. Komatsu understood customer service in construction industry. Thus, Komatsu Europe International N.V. in Belgium to coordinate and expand Komatsu's operations on the European continent in 1989. As of March 2017, Komatsu achieved consolidated sales in worldwide for 1,802,900 million yen (EUR 12,878 million), return on sales is 174 billion yen (EUR 1.25 billion).

3.3. The Factors of Komatsu's Growth

As Bartlet (1985) described Komatsu's history as improving product quality challenges since 1960s to 1984. In 1960s, Komatsu launched a quality upgrading program in tis factories. The program followed the total quality control concept. The objective of this program was to ensure the highest quality in every aspect of Komatus' operations. In 1970s, Komatsu America was established to develop business in the North America market, but the product lines were still limited. Komatsu concentrated to sell crawler-tractors and crawler-loaders, and their prices were almost 30% to 40% below similar Caterpillar's equipment. Unlike Caterpillar, whose servicing dealer network covered the worldwide, Komatsu had no such sales and service network, namely, Komatsu focused on selling its products.

By 1976, Komatsu gained almost 60% market share of Japanese market. However, In the fall 1977, the Japanese yen began appreciating rapidly against most major currencies. For instance, the yen/dollar exchange rate went from 293 at the end of 1976 to 240 a year later, namely, USD1.00-to JPY293 to JPY240. Therefore, Komatsu accelerated its product development program. Between 1976 and 1980, the number of product models offered in the five basic categories (bulldozers, excavators, dump trucks, loaders, and graders) increased from 46 models to 77.

Komatsu experienced fluctuation of financial performances in 1980s. Thus, Komatsu strongly succeeded its product line wider. The decision to become a full-line manufacture, however, meant that Komatsu had to reevaluate its licensing relationships with technology suppliers. In exchange for help in obtaining essential know-how from Bucyrus-Erie and International Harvester for the manufacture of excavators and loaders, Komatsu signed agreements giving American licensers a tight grip over Komatsu's exports of its products and a veto over the introduction of competing products in Japan.

In short, it can be summarized that Komatsu certainly grown through its high quality product with relatively low prices. That's the typical strategy of Japanese companies during their growing stage since 1960 to 1990. Therefore, Komatsu would encounter some trouble against servitization process, in next section.

4. THE CASE

4.1. Before KOMTRAX

In 1990, under strong leadership of the then president, Tetuya Katada, Komatsu established the research centre, called Kenki Kenkyujo (construction equipment research and development centre). Missions of the research centre were to develop electric controlled construction equipment. Electric controlled equipment meant a kind of automated and remote control, typically, autonomous haulage vehicle and remote controlled power shovel, and so on. A predecessor model of KOMTRAX has been developed there in middle of 1990s.

Now, KOMTRAX (Komatsu Machine Tracking System) is famous for one of the earliest and the most successful IT innovations in construction equipment industry in the world. However, KOMTRAX is neither revolutionary technology, nor advanced scientific product. Rather, it is standard communication system based on wireless (even conventional cellphone) network system between any Komatsu's construction equipment and its database. But, indeed it is true innovation ahead of ten years against competitors.

However, the original concept of KOMTRAX did not focus remote control, either autonomous haulage systems. Furthermore, according our interview with ICT division director Kazunori Kuromoto, he muttered that the original idea of this ICT system had not been understood even in the director board, no one could realize what this ICT system delivered a value for customers at that time.

4.2. Turning point of KOMTRAX

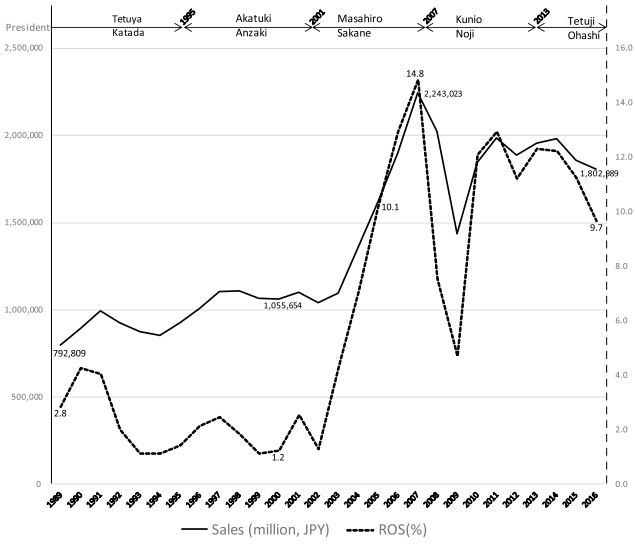
Before 2000, Komatsu struggled with economic recession in Japan, and unstable condition in China market. In 1998, Komatsu equipment sometimes was stolen in Japan, and used for crimes of robbery and burglary to ATM (Automated Teller Machine). The then chief in management planning, Masahiro Sakane asked some engineers what GPS informed us and worked against robbery and burglary. One of the answers was to know not only the location, but also additional information, for instance, operation usage of parts and components and devices in the equipment and machines. He intuitively knew the consequences of this GPS installation.

Early GPS was not built in, e.g. option. User might pay additional JPY200,000- to this installation. Even though, GPS effectively worked against robbery and burglary. GPS installation equipment locked its engine when the machine was moved 500 meter from the operation site. This protection has been received good reputation, specifically in China.

In 2001, Masahiro Sakane was appointed the president and he quickly decided that GPS should be default to all machines of Komatsu. Installation cost, at that time, was almost JPY200,000 for MSRP10,000,000 machine. That means that installation cost was approximately 2%. Mr. Sakane confessed that Komatsu operated that the decision was serious tough because Komatsu showed a huge loss, about 80 billion JPY around these days.

Mr. Sakane had a serious experience on maintenance and repair service when he used to be a manager of that department. For example, he often was flustered and confused when the customers asked to pick their equipment up from their operation sites. Because these sites were generally not on a map; rural and gorge area. The GPS would tremendous contributed to improve this miserable work. Thus, he had the confidence that customer value from the GPS should be worked not only for the customers, but also Komatsu's servitization. This GPS turned into KOMTRAX. Figure 5 shows Komatsu's performance both sales and return on sales (ROS), respectively, and duration of president appointments.

Figure 5. Financial performances of Komatsu and presidents



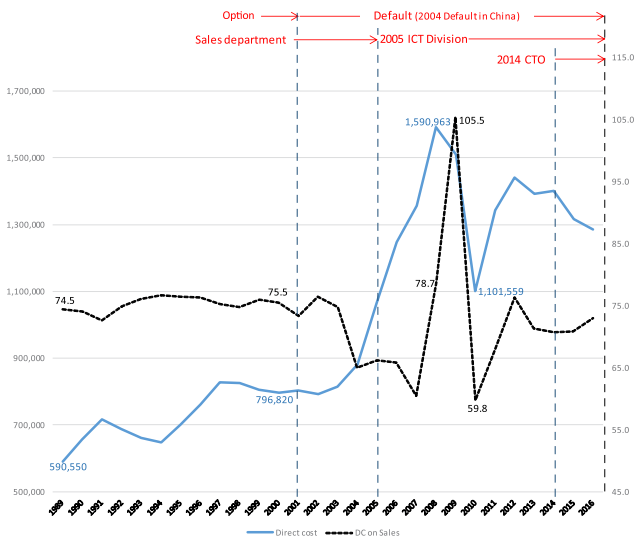
Source: Komatus Annual Report, each year.

4.3 Servitization Process of Komatsu

Figure 5 shows drastically improvement of Komatsu performance since 2001. With regard to sales, it grew almost double and ROS improve more than ten times. KOMTRAX seemed to be achieved huge success since 2001. Indeed, a part of this result should be true, but this was not servitazation. First, KOMTRAX is the built in devices with some additional cost (price up). Still, Komatsu had not realized what KOMTRAX was for its business. The then president Sakane only convinced KOMTRAX should be worked, but communication was still limited because the cost around 2000 was not as cheap as nowadays. In these days, communication was used by 2G network of conventional cellphone.

Indeed, Komatsu's machines have been sold as hardware by sales department by 2005. KOMTRAX was, at that time, used as sales tools. For example, information from KOMTRAX provided real operation duration of equipment and maintenance and repair moments to its customers. However, this is the point which divides into service or just sales tools. Because Japanese customers often asked such kinds of service for free, even to include in maintenance and repair service costs. Rare Japanese customers can agree with information from KOMTRAX as valuable. Consequently, Komatsu could not turn into servitization, but raise the prices of its equipment and machines. Servitization should be waited by Information and Communication Technology (ICT) division had been established in 2005. Figure 6 shows Komatsu's improvement of direct production cost and its ratio on sales and organizational transitions. It is easily understood that direct production cost extremely increased since 2004, but both Figure 5 shows return on sales improved and Figure 6 shows ratio of direct cost to sales decreased, except in 2007 and 2008 for financial crisis.

Figure 6. Komatsu's organizational transition and performance of direct production cost



Source: Komatus Annual Report, each year.

4.4 Discussion

Since 2014, Komatsu appointed Chief Technology Officer and developed KomConnect for Smart Construction. Smart Construction is total construction management. That is servitiztaion of Komatsu. KomConnect is a main software of Smart Construction, namely, it is cloud platform to achieve smart construction (seamless connection from location decision to operation managements). It took about 15 years since first KOMTRAX appeared.

Table 1 shows a trial framework to interpret this Komatsu servitization process. According to main discussion framework in Figure 4, this article assumed that matching (orchestration) should be required to good (high performance) business model. Table 1 shows business model transition in Komatsu. First, original KOMTRAX played novelty service under the specific design elements: content as option, added product attractiveness as structure, and sales department government. Then, in servitization process, KOMTRAX is getting changing data processing service as content, under service structure, and ICT division government. Critical opinion against dominant business model discussion is the difficulty and ambiguousness to such transition. This Komatsu case must be the crucial case against such dominant servitization process studies.

Table 1. Business model transition

Design theme	Design elements		
	Mean	**Std. dev.**	**Male**
Novelty: Original KOMTRAX	Option	Product attractiveness	Sales department
Efficiency			
Lock-in: Current KOMTRAX	Data processing	Service	ICT division
Complementarities			

Source: Authors

5. CONCLUSION

The purpose of this paper was to show difficulty both transition process and recognition in the organization of servitization in a traditional manufacturing company. Using an example of Japanese company, this paper provided a crucial case which asked to re-evaluate the dominant servitization discussions and frameworks.

For next research, we will suggest some theoretical framework for studying servitization process. First, we should ask why Komatsu did not KOMTRAX as service per se from its beginning. This problem is related to legitimacy of the organization and industry. Legitimacy sometimes works as a driver, but often works as a restriction. In Japan,

it is general that people avoid to do a novel thing, namely trail. They strongly evaluate on avoiding failure than gaining success. In this case, legitimacy works as severe restriction. Furthermore, customer does it as well. To buy service, Japanese customers tend to ask including it in the product cost, namely, free delivery and free shipping. To change these kinds of customs are incredibly difficult. Therefore, evaluation of legitimacy toughness should be a reach theme.

Second, we should ask why customer at last accepted KOMTRAX, even product price was raised. Of course, one clear answer is to know the real effectiveness (utility) of equipment operation hours. Additionally, KOMTRAX delivers all aspects information of the equipment and machines. Technological advance of KOMTRAX is ten years ahead to competitors around 2001. However, such kind of advance can be easily disappeared under current global competition. In this case, important thing is inimitability. With regard to inimitability, technological advance is not enough. Rather, combining with service, or relationship with customers, must contribute to establish the inimitability. For KOMTRAX case, data accumulation and processing work as lock-in effect. Therefore, to estimate customer's evaluation functions becomes another research theme. Because customers sometimes hesitate to establish tight relationship with one specific supplier. Even though, effective service embedded in the product can solve these customer hesitations. After all, servitization process for a manufacture means to break legitimacy around the company, and to achieve inimitability through highly competitive products.

REFERENCES

1. Al-Debei, M.M., El-Haddadeh, R. & Avison, D. (2008). Defining the business model in the new world of digital business. *Proceedings of the 14th Americas Conference on Information Systems*, Toronto, ON, Canada, pp. 1-11.
2. Amit, R. & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22(6/7), pp. 493-520.
3. Bartlet, C.A. & Srinivasa, R. (1985). Komatsu Limited, *Harvard Business School Case*, 9-385-277.
4. Cavusgil, S.T. (1990). The importance of distributor training at Caterpillar. *Industrial Marketing Management*, 19(1), pp. 1-9.
5. Cusumano, M.A. (2004). *The business of software: What every manager, programmer, and entrepreneur must know to thrive and survive in good times and bad*. New York, Simon and Schuster.
6. Deephouse, D.L. (1999). To be different, or to be the same? It's a question (and theory) of strategic balance. *Strategic Management Journal*, 20(2), pp.147-166.
7. Eckstein, H. (1975). Case study and theory in political science, F. Greenstein and N.W. Polsby (Eds.): *Handbook of Political Science, Vol. 7, Strategy of inquirey*, Reading, MA: Addision-Wesley, pp. 79-137.
8. Eisenhardt, K.M. (1989). Building theories from case study research. Academy of Management Review, 14(4), pp. 532-550.
9. Hagel 3rd, J. & Singer, M. (1999). Unbundling the corporation. *Harvard Business Review*, 77(2), pp. 133-141.
10. King, G., Koehane, R., & Verba, S. (1994). *Designing social inquiry: Scientific inference in qualitative research*. Princeton, NJ: Princeton University Press.
11. Porter, M.E. (1985). *Competitive advantage: Creating and sustaining superior performance*. New York, Free Press.
12. Reinartz, W. & Ulaga, W. (2008). How to sell services more profitably. *Harvard Business Review*, 86(5), pp.90-96.
13. Schumpeter, J.A. (1912/1934). *Theorie der Wirtschaftlichen Entwicklung*, Leipzig, Verlag von Duncker & Humbolt (Translation by Redvers Opie, *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, New Brunswick, Transaction Publisher, 2004).
14. Shostack, G. L. (1982). How to design a service. *European Journal of Marketing*, 16(1), pp.49-63.
15. Slywotzky, A.J. & Morrison, D.J. (1997). *The profit zone: How strategic business design will lead you to tomorrow's profits*, New York, Times Business.
16. Snihur, Y. & Zott, C. (2013). Legitimacy without imitation: How to achieve robust business model innovation. *Academy of Management Proceedings*, 2013, p.12656.
17. Sorescu, A., Frambach, R.T., Singh, J., Rangaswamy, A. and Bridges, C. (2011). Innovations in retail business models. *Journal of Retailing*, 87, pp. S3-S16.
18. Stremersch, S. & Keko, E. (2015). *Komatsu: The rise of a service-dominant logic*, IES600, M-1328-E, IESE Business School.
19. Suarez, F.F., Cusumano, M.A. & Kahl, S.J. (2013). Services and the business models of product firms: an empirical analysis of the software industry. *Management Science*, 59(2), pp.420-435.
20. Ulaga, W. & Reinartz, W.J. (2011). Hybrid offerings: how manufacturing firms combine goods and services successfully. *Journal of Marketing*, 75(6), pp.5-23.
21. Vandermerwe, S. & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal*, 6(4), pp.314-324.
22. Yin, R. (1984). *Cause study research: design and methods*. Thousand Oaks, Sage Publications.
23. Zott, C. & Amit, R., (2007). Business model design and the performance of entrepreneurial firms. *Organization Science*, 18(2), pp.181-199.
24. Zott, C. & Amit, R., (2009). Business model design: An activity system perspective. *Long Range Planning*, 42(2), pp.216-226.
25. Zott, C., Amit, R., & Massa, L. (2011). The business model: Recent developments and future research. Journal of Management, 37(4), pp. 1043-1068.