ALIGNING BUSINESS STRATEGY WITH THE SUPPLY PROCESS THROUGH EFFECTIVE SUPPLY CHAIN COLLABORATION

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ABSTRACT
The alignment of the product strategy with the supply chain process is a key for the firm to adopt a strategic behavior enabling competitive value creation over time. Collaborative efforts to coordinate involved activity units are necessary for this strategic alignment. But it is often mentioned that there are difficulties to implement such collaborative efforts. Those difficulties come from organizational barriers and uncertainties related to potential performances by the alignment of the product strategy with the process. In this study we focus on how to reduce the uncertainties in the supply chain process based on actual successful collaboration cases. The cases are drawn from the digital still camera market involving high uncertainties, especially the demand uncertainty. We will suggest that the collaborative efforts should be implemented systematically under a normative perspective that contributes to the reduction of the uncertainties in order to secure the competitive alignment over time.

Keywords: supply chain process, supply chain collaboration, demand uncertainty, digital still camera,

1. INTRODUCTION
The alignment of the product strategy with the supply chain process is a key for the firm to adopt a strategic behavior enabling competitive value creation as Porter (1980) pointed out. In the business practices, however, many firms have failed to behave strategically (Kim and Mauborgne, 1997). They hardly adopt a determined strategy such as the cost leadership and the differentiation strategies as defined by Porter (1980). Singh et al (2014) argue that it is difficult for companies to solve trade-offs between different indicators of competitiveness such as quality, cost and delivery competencies to shape their business strategies because most of companies intend to strengthen the competitiveness based on the past and cumulative competencies. As a result, we can say it is hard to find such distinguished strategies as Porter (1980) pointed out. The point is that companies make adjustments to strengthen their competencies depending on competitive changes in markets. Then the misfit or misalignment between the product strategy and the supply chain process comes up because companies cannot make timely adjustments to set up a desirable competitive alignment responding to competitive changes.

The difficulty of securing the competitive alignment over time comes from many sources. Risk is one important factor (Porter, 1980). Risk is attached to uncertainties in the firm’s environment (Christopher and Lee, 2004). One of the most critical uncertainties is the
uncertainty of demand (Christopher and Lee, 2004). The uncertainty of demand gives significant effects on the decisions on the company’s activities as well as the strategic posture. It is also influential on the firm’s performances such as sales and profit (Cachon and Terwiesch, 2012; Chopra and Meindl, 2012; Christopher and Lee, 2004). We can say that the degree of the demand uncertainty is high if the degree of controlling market is low. The degree of controlling market implies how deeply the firm understands the market’s needs which change along the product life cycle and how effectively the firm meets such needs (Cachon and Terwiesch, 2012).

We define here the degree of controlling market more specifically as the controllability of demand. The controllability of demand depends on, firstly, the firm’s competitive position in the market; secondly, the influence of the firm’s product on the demand itself; and, thirdly, the firm’s supply chain process capability responding to specific demand patterns. As for the first and second factors, in actual business situations, the product’ differentiation degree in terms of quality, price, delivery, and competitors’ actions together are influential on the demand pattern of the firm’s product. The third factor, the supply chain replenishment capability, ultimately determines the adaptability to the demand volume as well as its variability (Morita, 2004; Machuca and Barajas, 2004).

Those risks or uncertainties which are mostly caused by the weak controllability of demand work to discount potential benefits by the alignment. It lowers the incentive to change existing alignments. The collaboration is one of the most effective means to change such existing alignments. When an alignment changes in a way to involve external processes operated by external partners, the collaboration becomes critically important. But, although supply chain collaboration is considered as one of the primary business strategies to improve companies’ performances (Flynn et al., 2010; Van der Vaart and Van Donk, 2008; Frohlich, 2002; Lee and Whang, 2000), it is still not an easy practice and remains as an elusive goal in actual business (Beth et al., 2003).

The collaboration should be designed to reduce those uncertainties or increase the controllability of demand in order to be an effective means for the alignment. In the past research on the supply chain collaboration, adequate attentions have been paid neither to implementation of the supply chain collaboration that can be useful in actual business situations, nor to specific associations of the collaboration with performance measures (Pagh and Cooper, 1998; Christophe et al., 2005). Also actual managers still find it difficult to implement the collaboration effectively (Mentzer et al., 2000).

In sum, the collaboration issue in the supply chain has not yet been researched enough to give meaningful insights to implement the collaboration effectively. This study tries to approach to the unresolved issues as mentioned above. In the following section, we review the past research on important factors for the collaboration success. Then, we introduce a framework to interpret our actual collaboration cases, together with the extracted factors in the review. We will propose an implementation strategy of the collaboration in the supply chain based on this framework. We expect this framework can be as one of normative perspectives to build up the competitive alignment through the collaboration in the supply process.

2. LITERATURE REVIEW
The supply chain collaboration means two or more companies work together to create more competitive advantages and then higher performances than otherwise (Flynn et al., 2010; Van der Vaart and Van Donk, 2008; Simatupang and Sridharan, 2002).
Implementing such an effective supply chain collaboration is a complex and challenging task. Changes or shifts of competitive focuses in quality, cost and delivery over the product life cycle, product variety, and different types of partnerships with different retailers, give difficult complexities to this issue (Davis, 1993; Lee and Billington, 1993; Fisher, 1997; Strader et al., 1998; Lee, 2002). Furthermore, conflictive relationships among involved partners in the supply process make the collaboration more difficult (Vijayasarathy, 2010).

A well-defined mechanism for coordinating supply chain partners becomes important in managing the supply process (Sahin and Robinson, 2002). The mechanism needs to consider three factors for its well-functioning. They are reward, information sharing and trust for collaborative efforts (Smith et al., 2007; Yang et al., 2008).

Yang et al. (2008) argued that individuals or groups attempt to interact with others expecting certain rewards. Their attitudes and behaviors depend on the levels of net rewards by the interaction (Narasimhan et al., 2009).

Information sharing among suppliers, a manufacturer, and retailers allows them to improve forecasts, synchronize production with delivery, coordinate inventory-related decisions, and develop a shared understanding of their performance impact (Lee and Whang, 2000; Simchi-Levi et al., 2000). Many researchers have argued that information sharing is one of the most critical factors to operate supply chains effectively and gives an important solution to reduce the demand uncertainty (Holm et al., 1999; Subramani, 2004; Zhang and Chen, 2013).

Trust can be defined as a firm's expectation that their partners will perform a particular action to benefit their interests irrespective of the firm’s ability (Mayer et al., 1995). Trust amplifies the information sharing because partners in a high mutual trust relationship are not hesitant to share information and believe the information they receive (Beccerra and Gupta, 1999; Kwon and Suh, 2005). Then, the trust is a leverage in activating the information sharing in the supply process (Lee and Whang, 2000).

Finally we review on the performance outcomes the supply chain collaboration is expected to bring about. The major reason why firms want to collaborate with other firms is to improve performance and to secure sources of long-term competitive advantage. Performance outcomes of the supply chain collaboration found in the literature are, firstly, increased responsiveness (Bowersox and Daugherty, 1995; Leenders et al, 1985; Nix, 2001); secondly, product availability assurance (Bitner 1995; Smeltzer and Siferd, 1998); thirdly, optimized inventory (Cooper and Ellram, 1993; La Londe and Masters, 1994); fourthly, increased revenues (Andraski, 1999; Mentzer et al., 2000). But we emphasize that more important is not a temporal benefit but the sustenance of high performance over time.

The past research suggests us a set of key conditions for successful collaboration and potential performances by such collaboration. But there is no research on how to implement the collaboration to achieve the sustainability of high performance momentum of the company.

3. RESEARCH FRAMEWORK AND PROPOSITIONS
Our research focus is, as mentioned before, put on the implementation of collaboration in the supply chain to improve the strategic alignment and the firm’s performances over time. To cope with these objectives, we firstly introduce a framework under which the company directs its collaboration efforts to achieve the strategic alignment. Our research framework is based on the concept of Absolute Supply Chain Orientation Strategy (hereafter, ASCOS), which one of the authors proposed. It indicates the initiatives that the firm should take to enhance and
sustain its performances (Morita et al, 2015a). This strategic orientation is a kind of culture that leads to the strategic alignment as well as the firm’s performances (Morita et al, 2015a).

There are two reasons for the introduction of this concept in our research. The first reason is to bring in a normative perspective to show what collaboration efforts are meaningful in terms of aims and potential benefits. The second reason is to make the efforts operational and workable for practitioners by showing potential practices to be involved in the collaboration. Based on the framework, we propose that the company needs a comprehensive strategy for the collaboration under which present and future collaborations are designed and implemented systematically if the company wants to be capable in sustaining its competitiveness under changing circumstances and competitive requirements over time.

We recapitulate the concept below (Morita et al, 2015a). The concept starts described as follows:

\[ V_{s*} = d(T_P + R_T) + SS \]  

where

- \( V_{s*} \): Theoretically ideal volume to be secured in a supply chain
- \( T_P \): The raw process time to fully transform a unit of product in the chain without any waiting time (Hopp and Spearman, 1996)
- \( R_T \): Inventory review time for replenishment defined in the same time unit as \( T_P \)
- \( d \): The average demand rate per time unit defined in the same time unit as \( T_P \) for the future period of the same length as \( (T_P + R_T) \)
- \( SS \): The safety stock level to be determined depending on \( T_P + R_T \), in accordance with an allowable stock-out level

This formulation is derived from Little’s law by replacing the throughput rate with an estimated demand rate for the future period of \( (T_P + R_T) \). This equation can be interpreted to show \( V_{s*} \) as a theoretically ideal level of inventory to be secured in the supply chain, given a predicted demand rate and a permissible stock-out level.

If \( V_{s*} \) is minimal given a predicted demand rate and a permissible stock-out level, the company’s committed resources can be minimized. Given the level of \( d \), the company is expected to maximize the profit by minimizing the cost. ASCOS says that the company should continuously minimize \( V_{s*} \) by improving replenishment lead time, Just-in-Time replenishment, quality conformance and demand variability (Morita et al, 2015a). These initiatives, even if lot size economy comes in, creates more advantageous operations in terms of cost than competitors. This principle should exist and prevail in the company as a whole regardless of any product/market for sustainable competitiveness over time.

The most difficult factor in any business is risk. The risk is divided into two risks, too much and too small resource commitments. The former is usually brought about by excessive inventory and the latter by lost sales. Minimization of risk is the most important necessary condition that the company should seek if the company wants to live long. The minimization of the committed resources \( V_{s*} \) given the level of \( d \) is a counterpart of the minimization of risk. If the company wants to maintain the risk minimization posture as its basic business principle, the four initiatives should be always kept in mind of people of the company and should be improved continuously in every activity phase and occasion. Sustaining the four initiatives is considered to push the company towards lesser risk and higher profitable positions than otherwise.

High ASCOS companies are confirmed to show higher comprehensive perceptual competitiveness (the average of unit cost of manufacturing, on-time delivery, quality
conformance, product capability and performance, and product innovativeness), strong linkage between business and manufacturing strategies, and higher appreciation of manufacturing as a competitive weapon as Hayes and Wheelwright (1979) advocated (Morita et al, 2015a). It is also confirmed that a significant driver of ASCOS is the inter-functional product development practice (Morita et al, 2015a). ASCOS looks biased towards operations. But its positive contribution to new product development activities as well as market share is also confirmed (Morita et al, 2015b). If ASCOS prevails as a culture of the company, it contributes to the linkage of business strategy to operations. In other words, it is expected to strengthen strategic behaviour of the company.

Long-run high performance companies need to sustain competitiveness of their products over their product life cycles because any product goes through its product life cycle even though it is initially radically innovative. It means the product should adapt to changes of competitive requirements over the product life cycle (Lambkin and Day, 1989) and maintain its competitiveness. In the adaptation, supply chain processes, main parts of operations, should be aligned to support products’ competitiveness. Thai is, the effective alignment of product attributes and supply chain processes should be secured. ASCOS, if prevailed in the company as a culture, is expected to lessen possible conflicts among different functional people such as product development, manufacturing and marketing and lead those people to more productive solutions for the company because those involved people share the common criteria of the four initiatives. Then, the likelihood of setting up the effective alignment timely will be improved.

We hypothesize the collaboration in the supply chain process should be also designed and conducted as a part of the four initiatives’ execution. As we described above, the alignment becomes difficult when the demand controllability is weak because the important conditions extracted in the above literature review, such as reward, information sharing and trust, become difficult to be secured. The uncertain reward fails to give adequate incentives of involved people to commit themselves in the collaboration. This weakens the incentive of information sharing and then also the trust. Among the three elements, the reward is critically important. Especially, if theoretical reward is none, no commitment is expected. This study assumes ASCOS can be a framework that generates such theoretical rewards as well as focuses the collaboration should have. We propose that, if ASCOS prevails in the organization as a framework under which all collaborations are designed and executed systematically, the company will be able to use the collaboration as an effective lever to sustain its competitive strategic alignment in the evolved market. In the next section, we turn to the actual collaboration cases and identify their achievements and problems.

4. ANALYSIS OF COLLABORATION CASES
We have chosen a case approach to the supply chain collaboration in the real world. Yin (1994) pointed that case studies are appropriate for exploratory research. All cases in this study are collaborative efforts of Company X, an electronic company that manufactures and sells digital still camera. The cases involve transactions with three retailers F, B and A, each of which differentiates each other in the market of digital electronics products in France.

Company X that has the strong business principle of “customer first,” entered into the French digital still camera market in 2003 when the demand grew rapidly and the market looked keeping its momentum. For example, the saturation ratio of digital still camera was only 21.5% in 2004. In 2007, 5 million units of digital cameras were sold and the saturation ratio jumped to 56.9%. The market was transiting from the introduction to the growth stages
in this period. At this stage, major retailers wanted the manufacturers to be involved in solving problem of poor delivery or availability. Then, keys for expanding the market share was to build a competitive chain that could meet the requirements of delivery and improvements of products by putting technologically up-dated features to products continuously due to fast technological changes in this field. Company X was not an exception. Company X was going to implement collaboration activities with retailers in major markets, such as Europe and USA to build up such a competitive chain.

Three types of data are used for this case study. The first data were those derived from the author’s interviews with involved retailers. Sixty interviews in total were conducted from 2005 through 2009. The second data were on the demand forecast accuracy (forecasting error), which was, the gap between forecast and actual sales. We used these data to measure the degree of performance by increasing the demand controllability or to reduce the demand variability. The data covered the same period as that of the interview data acquisition. As other performance data, we used the data on product shortage (stock-out), inventory, lead-time for replenishment and sales revenues during the same period as above. Thirdly, we used the market share data during the period from 2005 to 2009 of GFK, a market demand research company, to measure the market performance.

4.1 The retailers under the collaboration
Company X approached to three retailers, F, B and A, for the collaboration. Retailer F is a retail chain specializing electronics items operating 81 shops. Retailer F’s target customers are profiled as the innovator or the early adopter type. They pay premium if products fit to their tastes. Retailer F attracts customers by offering a pleasing ambience, extra service such as enjoyment of talking with sales staffs on the shop floor and their technical advices about products’ usages and a wide assortment of high-end innovative merchandises. The main reason why Company X chose Retailer F as the first collaboration partner for its digital still cameras was that it was the only dealer capable to promote sales both in quality and in quantity. Company X expected that the collaboration with Retailer F could increase the demand controllability by influencing on the demand trend of the digital still camera due to Retailer F’s competence of igniting market trends.

Retailer B was a retailer of electronics multiple that carries a wide and deep assortment of digital consumer electronics products. Retailer B had 76 shops and organized their stores to display a large numbers of merchandises with some discounted offers. They tried to boost the traffic of customers to their stores by promotional catalogues. Their stores, featured with a warehouse type architecture, were basically located in the suburbs of big cities offering large parking facilities. Retailer B’s customer profile belonged to the class of middle majority with high propensity for the cost-performance factor of product. Hence Retailer B attracted customers by offering a large variety of merchandises with some discounted.

In 2007, as the product life cycle of digital still camera transited from the end of growth to the beginning of maturity, the market demand became stabilized and predictable. Price, promotion as well as product variety started to affect customer choice more than before. Company X recognized two changes in the market when the digital camera saturation ratio had been over 50%. The first change was a surge of demand of the middle class family, mostly living in the suburbs. The second one was a preference for color variation suggesting personalized possession was going on. Retailer B looked as an appropriate channel for the changes. Retailer B’s target customer segment matched well with the middle class family and their stores were capable to display the color variation effectively thanks to the large shelf
space of the stores. However, Retailer B had to carry their goods on hand at each store to hand over products upon customers’ purchases. Consequently, the inventory level of Retailer B was extremely high such as 65 days in 2005. The shortage for best-selling models of Company X, however, was also high such as 15% that had frustrated their customers.

Finally, Retailer A was a hyper store chain retailer (100,000-300,000 square feet of store size) selling a combination of foods and general merchandises including digital consumer electronics. They offer discounts of products promoted by catalogues that occupy almost half of their sales. Those catalogues are distributed weekly with eight millions of samples. A hyper store chain such as Retailer A was not appropriate to appeal the value of new technology, but it is a good place to push sales of commodity type items. Retailer A had 121 shops that were mainly located in the suburbs. Retailer A’s customers were profiled as the late majority of customers or followers. The most important factor is bargained price.

Retailer A had very high inventory level of the digital still camera, such as 70 days in 2005 due to poor demand forecasting of sales by catalogues. On the other hand, the shortage ratio of fast selling models hit 13%. In sum, the demand controllability of Retailer A was very poor, and these situations were the same as those of Retailer B.

In 2008, Company X was hit by the dramatic average price down of the digital still camera market that amounted to almost 20% less compared with those of 2007 although the downsizing of demand was slight. The end of the maturity stage of the product life cycle was coming and the digital still camera became a type of matured product.

4.2 Contents of the collaboration

Company X and the retailers were suffered from the high levels of the retailers’ inventories as well as their stock-out of fast selling items in France. They are typical phenomena attached to the dysfunctional supply chains. The first focus of their collaboration efforts with the retailers was to reduce the replenishment lead-time between Company X and the retailers. So far, actual replenishment times were almost three weeks. This was due to the existing ordering rules. Based on them, the retailers determined the order volumes adding their own judgement and convenience.

Company X approached firstly to F to improve the existing rules in order to reduce the inventory level as well as the stock-out (from May 2005 to March 2007). Both companies reduced the time to one week consulting with the actual data of sales and their existing ordering procedures. They discussed interactively about the order volumes based on the sales records and finally agreed with the replenishment volumes. This collaboration was very effective to reduce the replenishment lead time and cut the inventory level. They set up a continuous replenishment policy (hereafter, CRP). Company X selected F as the first partner for the collaboration because Company X expected Retailer F would be able to propel Company X’s products in the market.

The next collaboration was to reduce the demand uncertainty caused by the forecasting error (from April 2007 to March 2008). They installed a collaborative planning and forecasting replenishment (hereafter, CPFR) system to improve the forecasting precision by sharing the information of actual sales. Implementation of CPFR together with CRP dramatically improved the replenishment lead-time and the forecasting accuracy.

Company X, based on the successful results of the collaboration with F, approached to B and A. With B, Company X started the collaboration to introduce the CPFR system (from April 2008 to March 2010) that was already set up with F. But a difference was to focus on the forecasting and replenishment processes. The change was appropriate for the needs of B
who wants to reduce both of excessive inventory and shortage. Also Company X initiated the collaboration with A from April 2008 to March 2009 to install the CPFR system of the same type as those with F and B. But it was adjusted to accommodate for the replenishment process of A. These two retailers, B and A, are important to Company X, especially at the growth and maturity stages of the product life cycle due to their characteristics of merchandising and selling systems. The results of the collaborations with B and A were successful as expected from the results of the case of F. Both of the replenishment lead-time and the stock-out were remarkably improved. These results are summarized in Table 1.

Table 1: Performance improvements by CPFR and CRP by the retailers (2005-2009)

<table>
<thead>
<tr>
<th>Retailer</th>
<th>Performance</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Forecasting error (%)</td>
<td>31.6</td>
<td>19.2</td>
<td>2</td>
<td>2.6</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Shortage ratio (%)</td>
<td>6.7</td>
<td>8.2</td>
<td>1.8</td>
<td>2.5</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Stock days (days)</td>
<td>43</td>
<td>22</td>
<td>19</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Lead time (days)</td>
<td>14.5</td>
<td>8.5</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sales units (pieces)</td>
<td>42,854</td>
<td>142,394</td>
<td>185,652</td>
<td>175,382</td>
<td>200,684</td>
</tr>
<tr>
<td>B</td>
<td>Forecasting error (%)</td>
<td>31</td>
<td>41.1</td>
<td>7.8</td>
<td>1.7</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>Shortage ratio (%)</td>
<td>15</td>
<td>15.7</td>
<td>7.8</td>
<td>2.7</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Stock days (days)</td>
<td>65</td>
<td>69</td>
<td>49</td>
<td>44</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Lead time (days)</td>
<td>21</td>
<td>14</td>
<td>7</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sales units (pieces)</td>
<td>7,246</td>
<td>33,935</td>
<td>48,817</td>
<td>51,135</td>
<td>67,592</td>
</tr>
<tr>
<td>A</td>
<td>Forecasting error (%)</td>
<td>10.5</td>
<td>28.5</td>
<td>16.5</td>
<td>18.6</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>Shortage ratio (%)</td>
<td>13</td>
<td>19</td>
<td>14</td>
<td>16</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Stock days (days)</td>
<td>70</td>
<td>82</td>
<td>74</td>
<td>75</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Lead time (days)</td>
<td>25</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Sales units (pieces)</td>
<td>2,235</td>
<td>27,969</td>
<td>35,936</td>
<td>49,163</td>
<td>55,747</td>
</tr>
</tbody>
</table>

(Source: Company X data)

Notes: Shortage ratio is defined for stock-out ratio. Lead-time (days) here are defined for replenishment from order confirmation to shop delivery.

The reduction of the stock-out also improves the accuracy of the demand forecasting defined by Mean Absolute Percent Error (MAPE), which is commonly used to calculate a performance measure for demand forecast accuracy, especially from 2007. MAPE is defined as the sum of absolute errors divided by the sum of the actual, that is, Σ |Forecast-Actual| / Σ Actual. “Actual” means the sales volume, that is, demand minus stock-out. MAPE will be improved when the stock-out is getting close to zero. Then reducing the stock-out reduces the forecasting error. Therefore, the accuracy was improved not only by the forecasting method, but also by decreasing the stock-out. On the other hand, the stock days were not so improved if compared with those of “lead-time (days)” in terms of the reduction ratio from 2005 to 2009. It means the safety stock is maintained high relatively for the reduction level of replenishment lead-time. This safety stock is interpreted as preparing not only for the demand variability, but also for the supply condition from Company X. That is, the replenishment volume sometimes includes certain adjusted extra volume over the demand. It reflects not only the variability of demand, but also the supply condition such as delayed delivery.

The improvement of demand forecasting accuracy, that is, reduction of forecasting errors, appearing in the row of Retailer F of Table 1, is largely accountable by the extensive collaboration from product development to sales. That collaboration resulted in remarkable improvement of demand predictability and high demand rate, even at the early stage of new products’ life cycles. The collaboration provides an environment where both company could enhance their knowledge of the market by learning from one another, especially in the process
of new products development (Suwannaporn and Speece, 2000; Hughes and Chafin, 1996; Cooper and Ellram, 1993).

Company X shifted its focus toward digital, especially of new products. The difficulty of forecasting new products and their successes were big concerns to Company X. For this purpose, Company X approached to again Retailer F which featured innovativeness and high-end products (2007-Present). The main reason why Company X had chosen Retailer F as a collaboration partner for new digital still camera was that it was the only dealer who was capable to promote sales in both quality and quantity. In terms of quality, the four stars mark defined by “Retailer F dossier” is very influential on consumers purchasing process. In quantity, the market share of Retailer F is highest in the digital camera market in France, 25%. Company X thought that the collaboration with Retailer F could reduce the high level of demand uncertainty of new products. Company X used to develop new products without any participation of other organizations such as retailers. Company X proposed a collaborative development approach to Retailer F. Company X developed features of new products together with the staffs of Retailer F. They could understand the new products’ concepts and features with each other and synchronize the product’s values with promotion and selling methods. This collaboration made it possible for them to align activities from development to selling consistently with customers. The result, Company X’s market share, dramatically increased from 1.8% in 2005 to 17.3% in 2009. Judging from this result, the collaboration of new product development with Retailer F was successful for improving the product’s attractiveness to the market.

The collaboration focus in our cases changed adaptively, according to retailers, to strengthen demand controllability over the life cycle. We could observe that the collaboration in the supply chain has effectiveness in terms of improvement of performance (less forecasting error, less shortage ratio, less stock days and less lead-time as well as more sales volumes).

The collaborations in our cases went well during the period. The key successful factors mentioned above, rewards, information sharing and trust, are all equipped in our cases. As those involved actors were aware of the troubles (high over stock and lost sales) in their processes, they were ready to figure out causes and potential problems. The rewards were expected to surpass the costs of efforts by all involved actors. The importance of information sharing was well understood by all because the aims of the collaborations and the estimated benefits were clear and well shared for them, although information sharing is sometimes hesitated by some of involved actors in usual cases. Therefore, in these cases, the trust among them was also relatively easily created.

The collaboration activities carried out in other European countries and USA of Company X were limited to replenishment processes, and they did not develop well. Because the reward concepts as the results of interactions costs of both parties were not well designed. For example, in the case of USA, although Company X made utmost efforts to reduce the replenishment lead-time and inventory stock, most of the benefits coming from them was shared mainly by retailer side. Those statuses led to dysfunctional information sharing and distrust of each other.

One important factor of success in France was starting with the wide-range collaboration with a strategic retail partner (Retailer F) considering the market evolution and extension of the collaborative efforts efficiently to other promising retailers at the later stages of the market evolution referring to the experience with Retailer F.
5. REINTERPRETATION OF THE COLLABORATION CASES BY THE FRAMEWORK OF ASCOS

The formula (1) suggests that the company’s performance is enhanced by minimizing $V_s^*$ given the demand level $d$. Firstly, Company X tried to reduce $(T_P+R_T)$ and the safety inventory $S_S$ given the level of $d$. This effort was applied to all retailers, F, B and A. The high inventory had negative impacts on the retailers as well as Company X. Therefore the reduction of the inventory was easily agreed between Company X and the retailers.

The formula (1) also suggests that the company could increase theoretically its performances such as profit and market share as well as its supply chain partners’ ones by raising the average level of $d$ through the joint development collaboration and by maintaining the effort to minimize $(T_P+R_T)$ and $S_S$ through reducing lead times and improving the predictability of demands.

The series of collaborative efforts of Company X were successful judging from the immediate effects as described above. All these benefits were natural results from improving the key factors implied by the formula (1). But the formula (1) targeted for the collaborations described above was a part of the total supply process including Company X’s upstream supply process. The managerial meanings implied in the formula (1) hold also for the total supply process, not only to the downstream supply chain process. Actually, the lead-time from Company X’s procurement of components to manufacturing of the digital cameras was around six months. The stock days in Table 1 remain the same after 2007 for every retailers involved. The actual collaboration efforts of Company X were not extended to the total process including the challenge for the reduction of such a long lead-time for procurement. Company X should have a wider perspective covering the total process of responding to markets over time including new product development, purchasing, manufacturing and delivering to markets.

Company X’s market share, once upheaved, has not stood well after these successful collaborations. It can be understood that Company X could not sustain the momentum of increasing competitiveness. When focusing on how to collaborate in the supply process, we could confirm the importance of setting up the conditions for successful collaboration, that is, rewards, information sharing and trust, pointed by the past research. The company should continue to prepare such conditions to improve its competitiveness over time. When considering how to exploit the leverage of the collaboration to enhance the competitiveness over time, we need to pay attention to the source of generating such conditions. In other words, a systematic exploration of the source should be embedded in the company’s managerial culture that induces people’s perpetual efforts to find opportunities to improve the company’s performances as well as potential partners’ ones. ASCOS, in our paper, is proposed to be a counterpart of this kind of culture. The limit of the improvements was caused by the limit of perspectives of Company X. The limit of perspectives is not the problem of functional silo phenomenon, but that of the lack of common criteria to be shared among all functional people.

6. CONCLUDING REMARKS

The alignment of product/ market strategy with the supply process is indeed a key for the company to be a high performer, that is, a company maintaining high performance over time. The collaboration is a way to develop such alignments among relevant activity units including external partners. The research on the collaboration used to focus on its effectiveness and conditions to realize its benefits for specific cases. Based on this study, we propose that
multiple perspectives are necessary. An essential point, again, is that the company should develop more competitive alignments than existing ones in the evolved market competition. Then, the culture supporting such improvement momentum needs to work together with the collaboration. We need to pay attention to a driving force of the collaboration. We assumed the concept of ASCOS as the driving force dictating designs and implementations of the collaboration in this paper.

As for the merits of this study, firstly, we confirmed the conditions of successful collaborations advocated by the past research based on the actual cases and the concept of ASCOS. Secondly, we provided a new insight of implementing the collaboration from a normative perspective which was scarce in the past research. Thirdly, we tried to go further by pointing out the importance of designing a series of collaborations based on the culture prevailing in the whole company. Specifically ASCOS, in this paper, seeks systematically for opportunities of collaborations to strengthen the total process alignment of the company over time. In the business practices, lots of firms are facing the difficulties to implement collaboration effectively due to the lack of clear logic of associating activities that improves the supply chain process with reward, information sharing and trust for collaborative relationship. ASCOS is useful for solving those problems because it suggests possible areas of improvements in the supply process, possible rewards accompanying them, and what information should be shared for the improvements. And, as a result, it nurtures trust.

This study has some limitations. Firstly, the amount of data in the cases including the length of period covered is not enough to prove our conclusions’ validity strongly. In addition, because of the need of maintaining the secrecy of company, details of data could not be publicized fully. Secondly, the collaborations described in this study are limited in terms of details and coverage. This makes this study an exploratory one. Thirdly, our investigation remains only as interpretations. We need to elaborate the framework for implementing effective collaboration strategies by associating specific activities of the initiatives of ASCOS with collaboration aims to generate collaboration patterns or strategies. All these drawbacks or limitations are our future research agenda.

ACKNOWLEDGMENTS
This study was supported by the grant by Japan Society for the Promotion of Science in 2015 (Code: 26380524 and 15K03669) and review team whose constructive comments have significantly improved the paper. We sincerely express our gratitude to the Society and review team for the support.

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