

# **Knowledge Transfer and the Sharing of R&D Capabilities at the Japanese Automotive Firms in Asia**

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(Keynote speaker)

## **1. Introduction**

Japanese main automotive firms have established R&D centers at many districts in the world, promoting global innovation activity. In the Chinese market which has accomplished rapid-growth expansion especially by automotive production and sales, and the Thailand market which has long operational experiences historically, Japanese automotive firms are tackling the measures of the design and development adapting to local needs bearing the subject in mind about the volume zone, and a low cost automotive market.

In the automotive industrial policy in China, the localization of R&D function and development of original brand cars are demanded, and the international deployment of the knowledge of Japanese automotive firms and the importance of sharing of R&D capabilities are pointed out. This kind of industrial policy would be followed in Thailand as seen from the recent emphases on R&D capabilities.

That is why; I would like to clarify the present condition and subject from the aspect of capabilities of R&D organization, and the personnel development, to show theoretical and practical implications to the Japanese automotive firms in China and Thailand in this study.

Knowledge is recognized as an important asset, since firms tend to accumulate intangible capabilities in global basis. Therefore, firm's business model that drives its search for innovation activities must be unique and be open in the value chain from products to marketing and services.

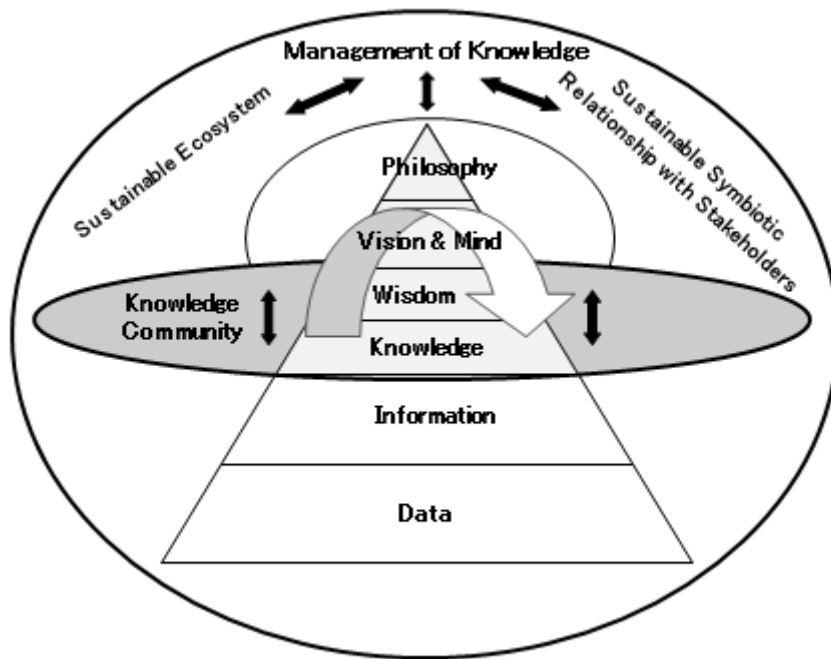
In this study, in order to raise the organizational capability of firms, it is significant to clarify what type of devices firms are doing. It will be presumed that interchange of knowledge is active at the innovated firms. In such type of firm, will it be related to set up sharing management philosophy and the vision inside the organization? In addition, are knowledge creation process and international deployment of best practices also positive in such type of firm? Under these research questions, I would clarify the state of arts from the case studies of the major Japanese automotive firms. Besides, I would also clarify that it is vital for all of the employees to share corporate objectives and values for the realization of creativity by the formation of organizational climates.

With the dynamic “Ba” to which knowledge creation is urged, what is the secret to be explored

from the case studies of Japanese affiliated automotive firms?

We adopt the concept of knowledge in a broad sense as follows; wisdom, and new knowledge such as creation of know-how, business process reengineering and an improvement, problem-solving capability, creative thinking, creation of a brand and a customer's value etc. shall be created in the dynamic knowledge community of practice as dynamic "Ba," which enables the wisdom, the vision & mind and corporate philosophy by sharing data, information and knowledge.

**Figure 1 Concept of Knowledge Creation and Ba**



Source: Hideo Ueki (2011)

## 2. Preceding Literatures

When the modern firms build the competitive advantage continuously, and creating practical knowledge globally and transferring it internationally, just a transfer of knowledge, which becomes ownership-specific-advantages nature is not enough. That is, it becomes important to make it unite with the emergent factors of autonomous knowledge peculiar to the best practices.

Thus, the mechanism which transfers and shares practical knowledge across the border, and the problem solving capabilities shall be examined, making full use of the networking of intra-corporate organizational resources through the effective use of practical knowledge by which the best practices

are carried out in the context of the tacit knowledge and know-how distributed in the world.

The main preceding literatures relevant to the theme of this study, the evolutionary theories are summarized as follows.

## **2-1. Resource Based View**

As a VRIO framework shows by RBV(Resource Based View), Economic value (Value), scarcity (Rarity), difficult and costly imitation (Inimitability), and organizational capabilities, (Organization), are the critical management resources of a firm for the continuous competitiveness (Barney, 1986).<sup>1</sup>

Thus, in the position of the RBV, it is necessary for the firm to acquire competitive advantages continuously, to turn one's eyes to firm's specific resources rather than competitive environment. Therefore, it is thought that heterogeneous resources with difficult imitation inside a firm are the fountainhead of firm's competitive advantage (Wernerfelt, 1984).<sup>2</sup>

Furthermore, they are "the method of the core competence which produces a competitive advantage is a group learning in the organization, and adjusting various manufacturing techniques, and unifying multiple technological flows" (Prahalad and Hamel, 1990).<sup>3</sup>

Thus, the RBV implies the process of theoretical evolution which turns eyes into knowledge and the acquired learning (Watanabe 2010).<sup>4</sup>

## **2-2. Dynamic Capability Theory**

A Dynamic Capability (DC) theory is developed in the context of a strategic theory and developed mainly in the opinion of the RBV; i.e. "management resources peculiar to an organization bring about a continuous competitive advantage peculiar to a firm."<sup>5</sup>

The DC theory presented the new viewpoint that it not only transforms internal resources according to outside environment, but a competitive advantage could be borne by making these resources coordinate with other firms.

The form includes acquisition of the management resources which leads not only an innovation but also an entrepreneurial activity by M&A and a strategic alliance.<sup>6</sup>

Furthermore, Teece asserts the necessity for the organization design over a firm boundary called a firm's ecosystem to work actively on the firm's external environment, and insists that the organization design which crosses a firm boundary should be realized.<sup>7</sup> That is, the importance of the promotion not only beyond the closed innovation based on the independent management of a conventional type but also a firm's boundary of opening innovation is pointed out (Chesbrough, H. W. 2003).<sup>8</sup>

As mentioned above, in the viewpoint of the DC, it is asked how the capability inside a firm is

adapted to external environment, thereby whether what we do with the learning which makes the conventional core capability change.

### **2-3. Knowledge Based View**

According to Spender (Spender, J. C. 1996), it was shown that the Knowledge Based View (NBV) has transcended manufacturing activities and the RBV of a firm, and it serves as a base of a firm's view evolutionary and dynamic for the creation of knowledge or its application as an independent theory.<sup>9</sup>

Nonaka (2008) has presented the knowledge conversion SECI process model through a different subject between the knowledge types that tacit knowledge differs from explicit knowledge, and an individual and a group. He has emphasized the process and event to understand the dynamism of a firm and individuals.<sup>10</sup> Whereas, Spender has asserted not only knowledge creation but also the application of knowledge to acquire broad and specific knowledge.

By RBV, it turns out that the fountainhead of the competitive advantage of a firm is started from management resources based on a VRIO framework. However, the business environment is changing every day, and if the fountainhead of a competitive advantage would be compelled to be also changed accordingly, RBV will stop at a static argument. On the other hand, the KB V which has newly appeared in the position of standing against RBV, the fountainhead of the competitive advantages is caught from the viewpoint of the dynamic changing process.

In this paper, management resources were argued that it has become difficult to hold continuous competitive superiority, because the business environment of the firm changes rapidly.

Therefore, it has been interpreted by KBV that dynamic process of knowledge creation and the application has been emphasized.

Besides, from the DC theory which has been borne and developed from the RBV, it has been stated that the construction of a competitive advantage, the acquisition of knowledge, and the importance of practical use beyond the boundary of the firm were vitally important so that the way of thinking of the open network should be considered by changing the perspectives of conventional closed internalized networks.

### **2-4. Knowledge Creation and Organizational Learning**

Firms create practical knowledge systematically and share through the international transfer and organizational learning.

Knowledge creation includes radical as well as incremental innovation, business process reengineering, and problem-solving leading to the enhancements of customer value and brand power. Such broadly defined knowledge creation spans all firm units not just production. Different authors

have emphasized different aspects. Senge (1990) points out that this process cannot be static but must be based on continuous improvement of capabilities.<sup>11</sup> Argyris (1993) views organizational learning as long term acquisition of knowledge leading to performance improvement through double-loop learning.<sup>12</sup> One of the key issues for management is to create what is known as a 'learning organization' with high capabilities for creation, acquisition and transfer of knowledge (Garvin, 1993).<sup>13</sup> Authors like Ulrich (1998) point out that a firm's capability to learn quickly is a key competitive advantage that is very difficult to copy. In this capability, the role of human resources development plays a crucial role.<sup>14</sup>

## **2-5. Deployment of Best Practices**

As Teece (2007) noted that implementing best practice may help an enterprise become or remain viable, but best practices that are already widely adopted cannot by themselves in a competitive market situation enable an enterprise to earn more than its cost of capital, or outperform its competitors. Likewise, invention and innovation by themselves are insufficient to generate success.<sup>15</sup>

However, deployment of best practices is effective for the first step of knowledge creation. Carla O'Dell and Grayson, C. J. (2002) wrote in terms of transferring internal best practices.<sup>16</sup>

Every organization takes advantage of the tremendous untapped reservoir of knowledge in their own backyard to reduce costs and increase revenue, speed, and customer satisfaction. For instance, (1) Internal transfer is a people-to-people process; relationships seem to precede and be required for meaningful sharing and transfer. (2) Learning and transfer is an interactive, ongoing and dynamic process that cannot rest on a static body of knowledge. Employees are improving, inventing, and learning something new every day. (3) A personal and organizational willingness and desire to learn are keys. A vibrant sense of curiosity and a deep respect and desire for learning from others may be the real keys.

## **3 . Research Method and Case Studies**

### **3-1. Research method and background**

The field interview studies were conducted based on the semi-structural interview questionnaires for the automotive firms in China and Thailand in September 2013 and March 2014. The interviews were conducted to the corporate executives and R&D professionals (the engineers, and personnel trainers who take charge of design and development function) for both Japanese expatriates and local managers at the Japanese affiliated automotive firms in China and Thailand.

In this study, the knowledge transfer and the creative activities would be analyzed from the view point of organizational capabilities and human resources development in charge of design and

development function of Japanese affiliated automotive firms in China and Thailand. Therefore, it would be clarified what are the enabling factors, and the relations of knowledge creation and sharing in the organization with organizational culture and human resources development to deploy emergent innovation.

Furthermore, the traditional studies of innovation have focused on the upward innovation, the innovation whose target is to develop high-end products. In the recent studies of innovation, however, the downward innovation, rather than the upward one, is drawing attention, as developing countries like China and Thailand grow rapidly. The approach called glocalization that the established industrial manufacturers have adopted for the last decades-developing high-end products at home and adapting them for other markets around the world will not be sufficient, as growth slows in the developed countries. To take opportunities in emerging markets and pioneer new segments in developed countries, firms must learn reverse innovation, developing products in countries like China and Thailand and then distributing them globally (Sakakibara, 2012).<sup>17</sup>

### **3-2. Case studies of Japanese affiliated automotive firms in China and Thailand**

In this speech, due to the limitation of time and space, some of the case studies such as Honda and Nissan of China, and Honda R&D case in Thailand would be shown in the presentation materials.

#### **(1) Dongfeng Nissan new original brand development” Venusia”**

According to the "Nikkei business" April 28, 2014 issue (10 - 11 pages), Nissan Motor expressed putting the small-size car "R30" of the budget prices below 50,000 yuan (850,000 yen) on the market by the brand name of Venusia (啓辰) by the Beijing automotive show.

Venusia was developed at the Hanato plant of Guangzhou as the 2nd brand of Dongfeng Nissan following the first original local developed brand in 2012. (This case is explained in detail in the speech.)

#### **(2) Sundiro Honda Motor cycle in China.**

In order to oppose a flood of the cheap product of a copy motorcycle in China, Honda dared to establish the joint venture with the local copy maker, and also performed technical guidance of the local supplier. Moreover, the supplier networks of the spot were taken in and the organization which makes cheap supply sourcing was completed. (The detailed story is presented in the speech.)

According to the data of Honda, that whose number of sale in China was 95 about 1,600,000-set share per year 24% fell to 99 800,000-set share per year 7%. Thus, Honda dare to took partnership with a copy maker's Kainan new Sundiro .The two-wheel operating department of the existing joint

corporation Tianjin Honda and Kainan new Sundiro was specifically merged, and a new joint corporation and new SundiroHonda were established (capital of about 11,350 million yen, 50% of Honda investment).

While new Sundiro Honda put an operating start and a 125-cc two-wheeled vehicle on the market for 5500 yuan (Japanese yen of about 80,000 yen) in 2001 and entered into the local city and the farm village part market, he began to for Japan export a 50-cc scooter.

This strategic scheme was successful, the share which was falling steadily reversed it, and new Sundiro Honda was suddenly ranked as the 140th place (a Japanese firm the 17th place) in foreign affiliated firm ranking in 2002 (sales of 2,581,710,000 yuan).

Furthermore, Honda Motorcycle R&D China was expanded in Shanghai to develop the original R&D capability in 2003.

### **(3) Honda R&D in Thailand**

Honda R&D in Thailand is functioning as a hub of R&D operations in Asia and Oceania area. Recently, it is collaborating with Indonesia and India R&D facilities of Honda for the joint design and engineering through dispatching technical expatriates from Thai to Indonesia and India.

In Indonesia, they have developed new model low cost green car “urio Satia” to the governmental request and local needs to widen the 3 line seats for the big family based on Thai made Asia strategic car”Brio.”

Whereas, Thai Honda R&D developed new diesel engine car for India “Amaze.” In the engineering process, they have short cut trial production process by using programming simulation, which has not been implemented in Japan as yet. This process innovation might be reversely transferred to Japan in the near future.

(This case is explained in detail in the speech.)

### **(4) Global Networking of R&D and Reverse Innovation**

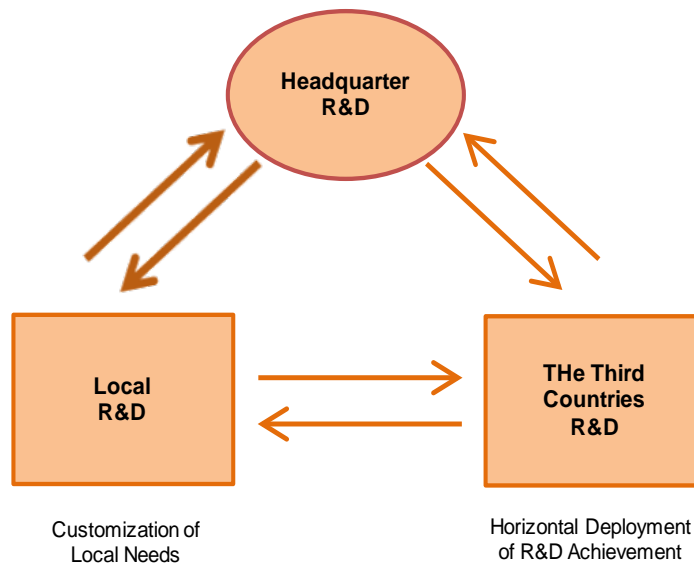
Global deployment of the R&D activity of a firm is shown by Fig. 2.

By performing R&D activity intensively in its home country head office conventionally, although the model that application development of the locally modified model which was adapted for local needs is carried out has become common in the overseas subsidiary. The examples where horizontal deployment of the R&D activity of an overseas subsidiary is carried out are now also increasing in the third country.

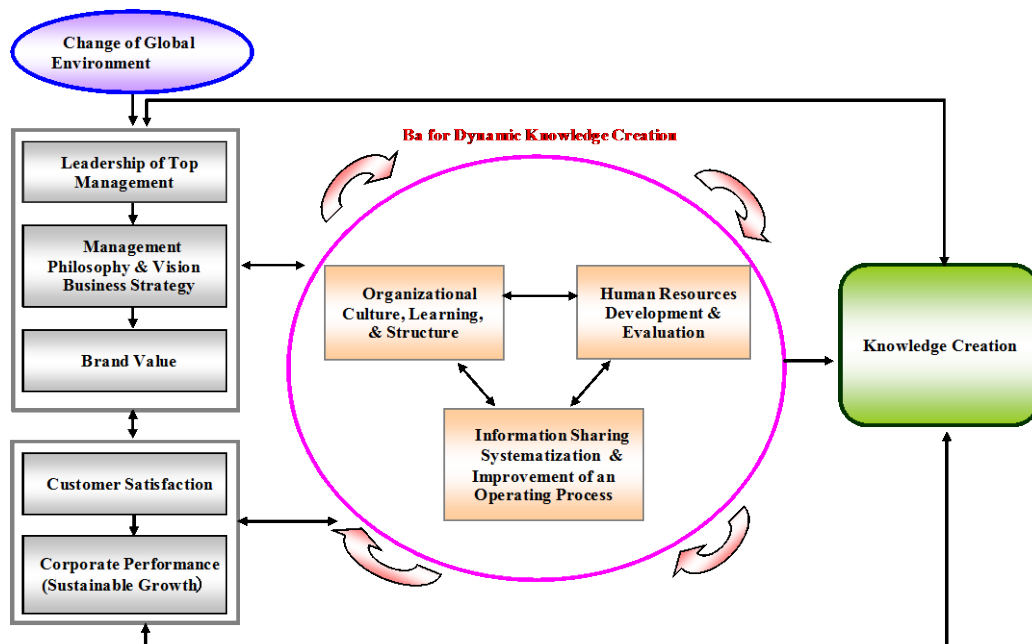
Moreover, the reverse innovation which Govindarajan, C. T. (2012) advocate is shown as a business model with a new adverse current phenomenon of an innovation.<sup>18</sup>

A reverse innovation is an innovation borne by the new solution from a developing country.

Besides, five big gaps called performance, an infrastructure, sustainability, regulation, and liking are original needs with an emerging market, and the needs of a developed country are different things. In the time until the gaps of the needs of a developed country and a developing country is lost, a reverse innovation from developing country flows backwards toward an upper part of a river.



**Figure2. Global Networking of R&D and Reverse Innovation**



**Figure 3 Management Model enabling Knowledge Creation**

Source: Ueki et al. (2011) *Knowledge wo Souzousuru Keiei (Knowledge Creating Management)*, Tokyo; Bunshindou co. p.35.



## **4 . Conclusion and Implications**

By the previous literatures, although there are studies on production technology, or labor and sales management, accumulation of the investigations on the localization of R&D organization and sharing of R&D capabilities are very few as yet.

Moreover, there are few empirical studies about the knowledge creation and human resources development in charge of innovative R&D function at the Japanese affiliated automotive firms in China and Thailand.

Thus, it can be said that this study has a significant meaning for the practical and theoretical implications for the knowledge transfer and the sharing of the R&D capabilities of Japanese affiliated automotive firms, although the motivation factors of leadership and knowledge creation process would be a little different from the function such as manufacturing and sales division.

From the case of Sundiro Honda Motorcycle Co. in China, developing a two-wheel firm in China, we knew that it tied up with the Chinese local firm which manufactures and sells copied products.

As for the Japanese firm, it was very weak on competition to have manufacturing and selling the product for lower class customers to be called volume zone, in order to make related deployment to the upper high-end market.

By a two-wheel maker, it has been a subject how the volume zone customer segment of the low cost segments in a newly emerging country and BOP market including China is secured.

About the ability of the trial of the reverse innovation in such a two-wheel motorcycle firm, it has been attracting attention for the deployment of four-wheel cars at the Japanese automotive firm in Asia.

R&D of the Japanese automotive firms has established the Central Research Laboratory and Development center in Japan to concentrate the fountainhead of core capability from the conventional globally centralized hub type, and has carried out the imitative transfer those knowledge and technology at the overseas development unit.

However, with global business deployment or the development request of a host country in recent years, Development Center is founded and expanded in the main districts in the world.

Therefore, a move of adjusted federation type R&D organization which stands on a viewpoint of global R&D, and the support organization of the head office are important.

In the R&D center (TMEC) in the Jiangsu, southeast development division of Toyota newly established in November 2010, maintenance of organization, such as development of the hybrid car in the Chinese market and new development of the improvement in other fuel consumption, is advancing.

Incidentally, the concept car "Yundong" which carries the hybrid system under development by this TMEC was exhibited by the Beijing auto show (April, 2012).

It is as the relevance of enhancement of the stage theory of economic development of management and technology transfer, the maturity of organizational learning, and a R&D executive organization form being shown in the following chart.

That is, in connection with the development stage of management and technology transfer progressing high order, the maturity of organizational learning will follow the process of creative innovation to 守 (Basic Learning), 破(Adaptive Learning), and 離(Co-Creative Learning)..

And as for the executive organization form of R&D, evolution in a transnational type is assumed through an adjustment federation type from the centralized type of power.

**Table1. The Development Stages of Knowledge Transfer, R&D Organization, and Organizational Learning**

Development Stage of Knowledge Transfer	Evolution of R&D Organizational Management	Maturity of Organizational Learning
1 Imitative Learning	Centralized Hub Type	守 Basic Learning
2 Localized Improvement	Centralized Federation Type ↓ Coordinated Federation Type	破 Adaptive Learning
3 Indicative Creative Innovation	Transnational Type ↓ Global Collaborative Network Type	離 Co-Creative Learning

Source: Bartlett, C. and Ghoshal, S. (1986), Ueki, H. and Ueki, M. (2008) H. Ueki (2013)

Furthermore, it follows on progress of a global innovation so that it may be seen by development of EV vehicle from now on, The role of external cooperation, such as an alliance, is evaluated positively, without using the existing base of its firm as the only base, and it is thought that it evolves into the "meta-National" model which thinks a dynamic state collaborative innovation process as important, and global-networking progresses.

Thus, the importance of R&D talented people's training is converted into Know-What and a Know-Why type from Know-How with evolution of the global business of a firm.

As the example of Tianjin Ichiki-Toyota considered, Know-Why type development talented Engineers' training becomes important.

Moreover, localization and the delegation of power of R&D organization become conditions for such knowledge creation and know-why typed personnel training.

That is why, it is vital importance for the global business model strategy by the head office, and it is important to take a HRM measures and the fusion measures of a open networking of global operations.

## Notes

- 1) Barney, J. B. (1986) pp.1231-1241.
- 2) Wernerfelt, B. (1984) pp.171-180.
- 3) Prahalad and Hamel (1990) pp.81-82.
- 4) Watanabe, N. (2010a), p88.
- 5) Watanabe, N. (2010b) p.72.
- 6) The definition in early stages of a dynamic capability is called "capability of the firm which performs integration, construction, and rearrangement of the competence wardrobe of an inside and the exterior, and copes with rapid environmental transformation." According to Helfat, C. E. (1997), a dynamic capability clears the possibility of a strategy and a course new for a firm by changing the resource base of an organization. That is, a dynamic capability is the capability for an organization to create, expand and correct a resource base intentionally (Teece, D, Pisano,G., and Shuen,A., 1997) .
- 7) Teece, D. J. (1997) pp.1319-1330.
- 8) Chesbrough, H.W. (2003).
- 9) Spender, J.C. (1996), p.59.
- 10) Spender, J.C. (1992), pp.389-410. Nonaka, I., Hirata, T., and Toyama, R. (2012).
- 11) Senge , P.M. (1990)
- 12) Argyris, C. (1993)
- 13) Garvin, D.A. (1993) pp. 78-91
- 14) Ulrich, D. (1998) pp. 124-134.
- 15) Teece,D. (2007) p.1321.
- 16) Carla O'Dell and Grayson, C. J. (2002) pp. 601-618.
- 17) Sakakibara, K. (2012) pp.19-27.
- 18) Govindarajan and C. T. (2012)

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