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## **METHODS OF FINDING BUSINESS PARTNERS OF MANUFACTURING FIRMS IN JAPAN**

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### **Abstract**

This paper addresses new methods of finding business partners for joint development in Japan. These methods create opportunities for a manufacturing firm, which has excellent technology, to find an appropriate business partner. We call these methods the Osaka model. In the model, a company finds a business partner among plenty of companies, while they establish mutual trust and solve higher levels of technological difficulties. The model shares strong points of both spot transaction and conventional co-development. In other words, this model takes advantages of both Western style and Japanese style inter-business relationship. This paper also argues the environment for encouraging the model. The area should be a place where you can obtain many sources of information. Increasing meetings or facilities on specific themes is an effective method to encourage the model in the area. In addition, a database with which each technological seed has been already arranged with their technological needs is beneficial for matching them. If such a database becomes a shared knowledge in the area, the model would be promoted.

**Keywords:** Joint Development, Technology Needs, Matching

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### **1. Introduction**

The Japanese Economy has been becoming better recently, but local economies are not the same. Economies in Greater Tokyo area and in Greater Nagoya area are good. However, economies in other areas are not so good. For example, Osaka faces deindustrialization: Head offices of large companies move to Tokyo and factories move to China. The number of small and mid-size firms has been decreasing.

The Japanese government implemented policies to create clusters in 2000s. Ministry of Economy, Trade and Industry interviewed a great number of companies and researchers. The total numbers of firms and researchers ministry officials visited are 13,300 and 5,100, respectively from the fiscal 2001 to 2003. The ministry also held plenty of seminars, parties and matching sessions for companies and research institutes in 19 areas. The total number of participants of seminars, parties and matching sessions was 230 thousands in the same period (Nikkei Global Journal, 2005). Although these movements gradually encouraged development of new

technologies or products and starting up of new firms, the result of the development was much below the expectation. That means new technologies or products are not easily developed.

This article addresses new methods of joint development in Japan. The methods create opportunities for a manufacturing firm, which has excellent technology, to find an appropriate business partner; a seed for innovative technology is matched with a need for the technology. We call these methods the Osaka model. We discussed the Osaka model in Takahashi and Takahashi (2011). We will develop the argument in this article.

In the model, most of the methods are practiced around Osaka, where plenty of manufacturing firms exist. However, this model is not always related to Osaka's peculiarity. In the model, a company finds a business partner among plenty of companies, while they establish mutual trust and solve higher levels of technological difficulties. Therefore, this model shares strong points of both spot transaction and conventional co-development. In other words, this model takes advantages of both Western style and Japanese style inter-business relationship. Recently, advantage of joint development has been increasing. Besides, interaction of many people and mutual trust contribute joint development. Hence, the Osaka model has high potential for development of new technologies and products. This model would be effective to revitalize local economies.

We also research the favorable environment for the Osaka model. To promote the model, the area should be the place where you can obtain a variety of information easily. Networks of companies or people would encourage such joint development.

This paper is organized as follows. In Section 2, we describe reasons of development of Silicon Valley and lessons from them. Section 3 explains the Osaka model and analyze it. In Section 4, we argue what environment should be created for encouraging the Osaka model. Section 5 concludes the paper.

## 2. Lessons from Silicon Valley

In this section, we describe reasons of development of Silicon Valley in the USA and obtain lessons for creating a cluster. One of the representative products in Silicon Valley is personal computer, whose product architecture is open-modular type. That contrasts with Japanese companies, being good at integral products such as cars and electrical appliances (See Figure 1).

	Integral	Modular
Close	Car Motorcycle Robot	Computer Machine tool Lego (plastic toy)
Open		Personal computer Packaged software Bicycle

**Figure 1. Classification of Product Architecture**

**Source:** Author's preparation based on Fujimoto (2001)

Components of personal computer are easily modularized, and then their specifications are unveiled. Hence, even a small firm can develop a small module. In addition, what kind of and when companies should develop modules is open to the public as road map. If a company successfully develops it, large companies would buy it. Then, owners of the company will obtain huge money and honor through IPO (initial public offering) or M&A. Therefore, some people work hard to develop new modules without sleeping enough. This means fierce competition occurs because of strong incentive to develop new modules.

As the background of these things, first, firms are well aware of the technological need in the market. Thus, matching of seeds and needs for technology is prone to occur. This brings about strong incentive of technological development.

Secondly, technology marketing by firms is active. For example, a large company in Silicon Valley invites three or four small and medium-sized enterprises to its office in a day and

gets them to make presentation of modules which they have developed. This example shows large companies are always looking for excellent modules and take positive attitude toward joint development with those small and medium-sized enterprises.

Thirdly, anyone who is clever and works hard can succeed in Silicon Valley. Hence, many people gather from all over the world. Inviting excellent people from outside makes the area active.

Fourthly, in Silicon Valley, human networks are important. Route 128 firms in Boston failed in creating a cluster because they lacked human networks. "Silicon Valley's network-based system supported a decentralized process of experimentation and learning that fostered success adaptation, while Route 128's firm-based system was concentrated by the isolation of its producers from external sources of know-how and information" (Saxenian, 1994, p. 9). This means that even if many companies concentrate in an area, it will not become a cluster without human networks.

One of the important reasons why such network was established in Silicon Valley is high mobility of labor. Job tenures of computer professionals in Silicon Valley averaged two years. Therefore, locking information inside a company is almost impossible. When an engineer quits a company, the knowledge, know-how, and experience he or she had acquired also outflow from the company. While every firm individually may see these as problems, they raise the capacity of innovation of the area as a whole.

The continual shuffling and reshuffling of employees reinforced the value of personal relationships and networks, rather than relationships within a company. People relied on trade shows, technical conferences, and informal social gatherings to maintain and extend their professional networks. So reputations spread across the entire community. If you lose your reputation by your terrible behavior, the rumor spreads quickly. In addition, because of high mobility of labor, a competitor one day may be a colleague the next. This creates a regional culture that balances competition and cooperation (Saxenian, 1994; Evans and Wurster, 2000).

Human networks are quite useful in various cases; obtaining new information, checking whether an information is true or wrong, looking for an expert of a specific technology, and checking whether a person is reliable or not. That is, know who is important to your business (Imai, 1984).

Fifthly, in the US society, many entrepreneurs have experienced exit or bankruptcy. In Silicon Valley, it is said entrepreneurs would succeed their business at the third attempt on average. This energetic entrepreneurship contributes fierce competition and swift technological development.

To sum up, the development of Silicon Valley depends on that most products of IT industry is open-modular type. In addition, failure is regarded as a good "asset" in American culture. The essence of Silicon Valley is competition and cooperation, and the area-wide-human network. Silicon Valley itself becomes an organic system and continues to learn and revolve. That is to say, Silicon Valley has spontaneous sociability (Fukuyama, 1995).

### **3. The Osaka model**

As we wrote above, cooperation and the area-wide-human network are keys for establishing a cluster. In Japan, Ministry of Economy, Trade and Industry often hold seminars, parties and matching sessions for companies and research institutes. The ministry expects these events trigger joint development of new technologies or products. Local governments, the Chamber of Commerce and Industry in each region, and non-profit organizations also hold the similar events. As a result, some new technologies or products were developed. However, the number of the joint development is much less than you expected.

Why do not these measures work well? We think that making opportunities of encountering among firms is not enough. For realizing excellent joint development, a company which has a unique and excellent seed for innovative technology has to encounter a company whose technological need fits the seed. That is, you have to create matches of companies which have excellent seeds and needs of technologies. However, most of such companies do not positively participate in those events in Japan.

The authors interviewed several large manufacturing firms in Osaka. They answered they had participated in matching sessions held by local governments or Chambers of Commerce and Industry, but they were not able to find good partners. Now they are not so interested in those events. As a result, the numbers of participants of both large companies and small and medium-sized enterprises have been decreasing.

This fact shows just making an opportunity of encountering is not appropriate. Therefore, we need to create the opportunity where a unique and excellent seed for innovative technology is connected with a need for the technology. This opportunity will promote co-development. Additionally, as we wrote in the last section, if needs for technology are open to the public, the direction of development is clear for many companies. Hence, many technologies will be developed toward the needs, and then matches of them will happen. Therefore, you have to create the mechanism that technological needs will be transferred to other companies and be connected to technological seeds. Now we explain the five methods of the Osaka model. In this model, companies encounter each other and connect their technological seeds and needs.

### **3.1. Opening Technological Seeds to the Public on Websites**

OMRON Corporation, which has its main research institute around Osaka, opens its technological seeds to the public at its websites since 2000. The firm looks for business partners of joint development using these technological seeds. As a result, OMRON is implementing joint research with some companies now. Release of such detailed technological seeds is sometimes done by universities, public research institutes or small companies, but rarely by large firms like OMRON.

OMRON releases the contents of technologies, that is, what can be done with the technologies. The company does not make public how to realize the technologies except patents. Strictly saying, this may not be opening technological seeds to the public. Nevertheless, it takes courage to put technological seeds to the public. This is because the release allows other companies to know that there is a method to realize the technology. In developing a technology, it is important to have known that there is a method to realize the technology. What is more, it takes several years to develop a product using the technology, so you must be worried that other companies may go ahead of you.

One of the large reasons why OMRON does the release is that this company is mainly a manufacturer of parts, not final products. Parts manufacturers have to get your potential customers to be aware of the advantages of their products, and then those companies will become their real customers.

Tens of thousands people access to OMRON's website every month and many companies offer joint development to this company. After OMRON receives an offer of co-development, it takes a long time to determine whether their technological seeds and needs are suitable for joint development. Finally, only a small number of offers are realized to be joint researches. Therefore, OMRON is never easily able to find a partner with the release of technological seeds.

However, this release has plenty of advantages. OMRON does not have to look for partners. Its website is accessed by people in all over the world. A more important advantage is that OMRON can make a relationship with a company which OMRON has not dealt with before. Engineers in other firms who are interested in OMRON's technology directly contact OMRON. Even if OMRON cannot start joint research at that time, OMRON may conduct co-research in another case in the future. Therefore, we expect this release of technological seeds will produce large results in the long run.

It is said that small and middle-sized enterprises in Osaka hope to find partners of joint development, but they do not want to show inside of their factories to other small and middle-sized enterprises. Actually, a company will not succeed in joint development without sharing its technology with others and discussing. So OMRON's method is suggestive for co-development.

### **3.2. Business Matching by Matching Navigators**

Business Innovation Center Osaka, which is managed by an extra-departmental body of Osaka Municipal Government, conducts Business Chance Doubling Project. In this project, fifty experienced engineers, who have retired from large companies, are named “matching navigators.” They visit small and medium-sized manufacturing enterprises in Osaka City and interview technological seeds, technological needs, and issues related to the business. At monthly meetings, matching navigators report their information about enterprises’ technical seeds and needs and look for those enterprises’ business partners for deals or joint development by taking advantages of all matching navigators’ knowledge and personal connections.

This project started in 2002. Navigators have visited 4,715 enterprises by March 2015. As a result, worth 110 million dollars of trade were realized. In a case, two enterprises, both of which navigators have visited, started a new transaction. In another case, a navigator introduced a small enterprise to a large company and they started a new transaction. The more enterprises navigators visit, the more data they accumulate. So efficiency of matching has been going up.

What small and medium-sized enterprises lack most are information, planning ability, and connections. Some small and midsize enterprises have excellent technologies but do not know how to put them into practical use. In addition, it sometimes happens that a stale technology in an industry is useful in another industry. Matching navigators assess enterprises’ technologies and intermediate between them and other firms. Nowadays, the speed of technological development has been increasing, so it is very difficult for companies to develop all products by themselves. Therefore, companies are interested in excellent technologies of small and midsize enterprises. This means that matching technologies is important not only to small and midsize enterprises but also to large companies.

Most matching navigators are in their late 50s or early 60s and former directors of R&D or production departments of large companies. They have strong knowledge of a specific technological field and connections with many large companies. Plenty of navigators cooperate and take advantages of their personal relationships. As a result, they succeed in matches of technological seeds and needs. Many Japanese municipalities are now imitating this method. So matching between an enterprise in Osaka City and an enterprise in another municipality occurred.

Another activity to raise the efficiency of matching is implemented by a local government. In Ota Ward, Tokyo, matching sessions for small and midsize enterprises are held twice a year. Beforehand, the stuffs of the sessions grasp technological seeds and needs of companies and organize appropriate their meetings. Recently, some companies started matching business. Additionally, Ministry of Economy, Trade and Industry conduct matches of manufacturers and distributors. Those activities are also hopeful.

### **3.3. Salons of Specific Themes**

Robot Laboratory, managed by an extra-departmental body of Osaka Municipal Government, is a multipurpose facility for robots: consulting, meeting, lectures, presentation of technological seeds and needs, and parties. Meetings of companies are often held there. Several projects about robots are also implemented there.

This facility is a kind of salon. That is, anyone or any firm who is interested in robots can come and exchange freely. They expect the exchange give birth to unique ideas or something. Robots are complex of various technologies. So the place for exchange of many firms and engineers are needed.

This facility promotes matching in two reasons. First, the theme of the facility is robots. Hence, visitors of the facility have definite technological needs and seeds. So matches of them occur easier. Second, this facility offers a space where anyone can come freely. Small talks or exchange of various ideas may give birth to unique ideas. They also create base of trust. Therefore, the salon’s existence itself is important.

### **3.4. Transactions Promoted by Government-Sponsored Joint Research Projects**

A joint research project regarding semiconductor was conducted for five years from fiscal 1999 in Kumamoto Prefecture, Japan. Kumamoto Prefecture Government organized this project and several companies participated in it. The central government granted two billion Yen to the project. The reason we pay attention to this project is that participating companies started transactions after this project finished.

In Kumamoto Prefecture, there are more than 300 semiconductor firms. So the Prefecture Government chose semiconductor as the theme of joint research project. The Prefecture Government nominated Professor Tadahiro Ohmi at Tohoku University for the head of joint research. Then, some large firms in Tokyo participated in this project, because Professor Ohmi was a world authority on semiconductor. As a result, researchers at Kumamoto firms had opportunities of joint researches with those at Tokyo firms.

Generally speaking, firms do not want to put their technological needs in the public. This is because if a company puts its technological needs to the public, rival companies would be aware of its strategy. However, as each firm's engineers met many times, they would know each other's technological needs from their conversation. What is more, the establishment of trust between them would make the transfer of the information easier. Those interchanges caused transactions of firms afterward. A Kumamoto firm started supplying a product to a Tokyo firm. This means that Professor Ohmi ultimately resulted in playing a role of coordinator of transferring large firms' technological needs to small and medium-sized companies.

We obtain some lessons. First, a government-sponsored joint research project made opportunities for exchange of engineers of companies. And then, each other's technological needs transferred to others. Afterwards, they had transactions. This means that making opportunities for exchange is important. Second, the Prefecture Government took excellent companies and people from other area, and they ended in transactions with local companies.

### **3.5. Release of Technological Needs**

Matsushita Electric Industrial Co., Ltd. invited presidents of thirty small and medium-sized companies to its head office in Osaka and held a meeting in 2005. At the meeting, Matsushita explained what kind of technologies they needed. The aim of this meeting is speeding up of innovation by introducing excellent technologies of small and medium-sized companies or looking for new suppliers. Therefore, small and medium-sized companies had chances to sell their technologies to Matsushita.

Kanagawa Prefecture Government held a meeting at which small and medium-sized companies in the prefecture introduced their technologies to Sony Corporation, which had already made to the public what field of technologies they needed. Toyota Motor Corporation conducts the similar approach on its website and accepts offers of technologies. These releases of technological needs do not easily create new transactions. However, these releases would be new methods of joint development.

### **3.6. Comparison with Conventional Inter-Business Transactions**

We have described the five methods of the Osaka model: The activities of joint development and finding new suppliers. They have several things in common. First, companies look for technological seeds or needs which just fit their own technological needs or seeds. To find such partners, they implement effective methods such as opening their technological needs or seeds to the public, using matchmakers, and making opportunities or places for engineers' meeting.

Second, they look for business partners in a long perspective. The above activities may not achieve good results in a short term. However, we expect that continuation of these methods will help companies to find good partners.

Third, companies look for partners in wide areas: not only their local areas but also other areas or foreign countries. They take advantages of economic globalization. Above all, the first point is significant in the Osaka model. In the model, it is essential to own unique and excellent

technological seeds and to opening technological seeds or needs to the public. Therefore, keys of the model are confidence in your strong points and the attitude of open mind.

		Product architecture	
		Integral	Modular
Inter-business Relationship	Closed	Conventional joint development (e.g. The Japanese automobile industry)	
	Open	Osaka Model	Spot transaction

**Figure 2. Classification of Inter-Business Transactions in the Manufacturing Industries**

Source: Author's preparation based on Takahashi and Takahashi (2011)

How unique is the Osaka model compared with conventional inter-business transactions? Figure 2 explains the uniqueness. In conventional joint development such as design-in or cooperation between large companies, firms choose your partners at the beginning, and then from the beginning, they conduct joint development with intense cooperation based on trust. This is characterized as closed inter-business relationship and integral product architecture. Its typical example is the relationship between Japanese automobile manufacturers and suppliers. In contrast, on spot transaction, "Open-style part procurement networks can be a source of competitiveness" (Nobeoka, 2002, p.180). This means that open inter-business relationship encourages competition among plenty of companies, so you can buy high-qualified and cheap components and modules.

Contrary to these inter-business transactions, the Osaka model is unique in some points. In the model, firms look for your business partners in wide areas, and they aim to solve high-level problems corporately based on mutual trust. That is, they keep open inter-business relationship with many firms. At the same time, they create intense cooperation with each firm, and then conduct joint development of integral-type products mainly. Therefore, the Osaka model is the third-type inter-business relationship, having advantages of both conventional joint development and spot transaction. In other words, this model takes advantages of both Western style and Japanese style inter-business relationship.

#### 4. The Environment to Encourage the Osaka Model

In this section, we discuss what kind of environment should be created for encouraging the model. As modularity has spread among the electronics industry in 1990s, Japan has lost a comparative advantage in the industry. So Japanese firms increasingly adopt modularity to their products now (Suematsu, 2002). However, Japanese companies have had superiority in integral products. They should use integrality in wider phases from components to final products (Fujimoto, 2002).

To understand that the production styles of integral goods have been changing these days, we take up a case of the microlithography industry as an example. Microlithography is a typical integral product. Japanese firms such as Nikon or Canon have had large shares in the industry until late 1990s. ASML of a Dutch company becomes conspicuous now and Japanese companies have tough games (Chuma, 2004).

ASML conducts only system design and relies for R&D on other firms such as Carl Zeiss, Philips, and IMEC. To make joint development easier, ASML adopted a clear-at-a-glance design of basic structure. The design improved the efficiency of communication between engineers among inside and outside of the company, and then contributed co-development. This experience shows when the level of complexity goes beyond a threshold, a firm feels the limitation of depending on small number of excellent engineers. To break through the situation, the firm

adopted a system that they input much manpower into the project and combine their information processing abilities. The range of manpower goes beyond the company. The necessity of trans-company input is especially high for science-based industries where the speed of innovation is extremely rapid (Chuma, 2004). In summary, as complexity of a product increases, R&D by a single company faces a limitation, so joint development has become more advantageous.

On the production of modular products, joint development is implemented more actively. As we described in Section 2, personal computer is a representative open-modular type product. You can make a personal computer even if you do not design it and just rustle up several components. Several years ago, Haier Computer of China imitated the Dell model: assembling most advanced components into personal computers and selling them on the website. However, Haier Computer failed in the business. The reason is that Dell has top level innovation ability, and the company chooses thirty top firms in the world as strategic partners and conducts joint development with them by providing with Dell's research finding. This means that the essence of the Dell model is Dell's supreme R&D ability and joint development (Yasumuro, 2003).

The above examples show that joint development has become more advantageous on both integral and modular architectures. So Japanese large companies should pay more attention to outside knowledge and human resources and joint development occurs by cooperation, not between departments, but between persons based on mutual trust. Exchanges between researchers or engineers of different fields are effective for promoting innovation. In other words, for companies to increase the ability of innovation, "they have to establish flexible but close inter-business relationship with many companies" (Nobeoka, 2002, p.194). Accordingly, the Osaka model is significant and potential methods.

Now we discuss what kind of environment should be created for encouraging the model. The basic answer is that we need to promote competition. The Osaka model has not spread among Japanese companies, especially among large companies. According to comparative institutional analysis, "when we think the process of evolution or transition, what we emphasize most is dynamism inside the system. Dynamism is generated by discovery and imitation of new system through competition" (Aoki *et al.*, 1996, p.13). This means that dynamism through competition changes old system or custom.

Additionally, as we described above, the essence of Silicon Valley is competition and cooperation. Not only Silicon Valley but also "many cluster advantages rest on external economies or spillovers across firms and industries of various sorts. A cluster may thus be defined as a system of interconnected firms and institutions" (Porter, 1998, p.213). So you have to create firms' cooperation as well as competition. The Osaka model is promoted by the product development race and cooperation of firms. If successful cases of the Osaka model increase, that will stimulate many firms, and in turn encourage product development race and cooperation of firms.

What should we do, then, to promote product development race and cooperation of firms in an area? The area should be a place where you can obtain many sources of information. "Even in today's world, where we increasingly manage in electronic space, geographical proximity remains a powerful tool to foster communication. This is particularly the case in the course of developing a complex product such as a new car model, with its thousands of parts" (Haour, 2004, p.40). What is more, the quality of knowledge created in the space is decided by how the space is strategically or autonomously organized or what kind of interaction is done in the space (Kokuryo *et al.*, 2003). Therefore, increasing meetings or facilities on specific themes is an effective method to encourage the model in the area.

In addition, databases of technological seeds promote joint development. A simple database is not so useful. A database with which each technological seed has been already arranged with their technological needs is beneficial for matching them. To make such a database, we need experts of each technical field. It is difficult for governments to pay much reward to those people. Retired people fit the part. As mentioned before, wages of matching navigators of Business Innovation Center Osaka are not high, but they enjoy their work because they can create new business. If such a database becomes a shared knowledge in the area, the model would be promoted.



As we mentioned before, demerits of putting technical seeds or needs in the public may help rivals. So companies release their technical seeds or needs only when merits of release are larger than demerits. This would be realized if many sources of information go to the companies and then joint development easily occurs. Networks of companies or people would encourage joint development.

## 5. Conclusions

This article described the five methods of the Osaka model. In the model, a company finds a business partner among plenty of companies, while they establish mutual trust and solve higher levels of technological difficulties. The model shares strong points of both spot transaction and conventional co-development.

The idea behind the Osaka model is that a key issue on the increase of joint development is the change in culture in the Japanese society. To win R&D competition, firms need not only to increase R&D expenditures, but also to find new business partners. Japanese firms are often reluctant to start joint development with firms which have not traded with. They have to change this culture. In addition, it is desirable that human networks exist in an area. For creation of human networks, people and companies have to establish mutual trust through their long-term exchange. If the strong mutual trust is established, joint development occurs frequently in the area.

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