

**Supplier Development at Honda, Nissan and Toyota:  
Comparative Case Studies of Organizational Capability Enhancement\***

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## **Abstract**

What factors facilitate and constrain the sustained development and replication of organizational capabilities at suppliers? This question is addressed in a comparison of historical case studies at Toyota, Nissan and Honda in Japan. First, as expected, replication difficulty is overcome by enabling companies to share the practice, rather than the representation, of tacit knowledge. Second, the interdependence in the hierarchy of routines, that constitute organizational capabilities, has led companies to broaden the scope of supplier development over time. Third, this broadening challenges suppliers to accept customer companies' intervention in internal investment decisions, requiring a certain mode of corporate governance. It is argued that the boundary of a capability-based firm may go beyond legally distinct units of financial control when firms are subjected to a cumulative process of capability enhancement.

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Supplier development -- a company's undertaking to improve its supplier's capabilities -- has been taken for granted in the Japanese automotive industry for several decades, and has received attention in the US only recently (Handfield et al 2000). But unlike in the case of new product development process (notably Clark and Fujimoto 1991; Nobeoka 1997), the automaker's organization structure and process for providing supplier development have not been studied systematically. More generally, theories of organizational learning and knowledge sharing rarely demonstrate how tacit knowledge move across firm boundaries. This article fills this gap, by showing that the transfer of organizational capabilities from the customer to the supplier company requires not only financial and resource commitment, but also a distinctive organizational and governance structure that facilitates long-term cumulative learning.

This study concerns itself with both (a) companies' organizational capabilities to develop their suppliers, and (b) organizational capability as a subject taught to suppliers. It sets out to answer the following question: what factors facilitate and constrain a firm's attempt to replicate its organizational capabilities at suppliers, within the intended boundary whilst preventing leakage to competitors? This article sheds light on this question by distinguishing among different types of capabilities, by identifying internal organizational structures that facilitate the transfer of new capabilities, and by linking organizational capabilities to corporate governance considerations. Supplier development may be positioned as a capability enhancing activity that fits neither 'market' nor 'hierarchy'. But without invoking the governance question -- who makes decisions about what resources to commit to what investment -- the notion of organizational capability alone ironically does not give guidance as to what constitutes an organization.

The empirical work reported in this article is based on case studies of three major Japanese automakers, Honda, Nissan and Toyota. Interviews were conducted with key respondents (managers in purchasing and supplier development engineers) in the firms and at some of their suppliers. Both historical and contemporary documents provided by the companies were also consulted. The main aim of comparing the three companies, rather than studying one firm, is to address the question 'why do firms in the same industry differ in their performance?' by focusing on differences in organisational processes and incentives (Nelson 1991). At the same time, survey evidence is used to gauge the differences in the breadth and depth of supplier development activity in Japan, Europe and North America.

Section 1 discusses the organizational capabilities approach in so far as it is relevant to the topic of supplier development. Section 2 surveys the range of supplier development activities at each of the three automakers. Section 3 compares the three companies' structures and processes for supplier development, and discusses the issue of replication of such structures and processes outside of Japan. The paper concludes by drawing broader theoretical implications concerning capabilities, governance and the boundary of the firm.

## **1. Supplier Development as an Organisational Capability and a Mechanism for Replicating It**

Supplier development is a procedure by a company to help improve its suppliers' capabilities. More specifically, it may be interpreted as a firm's attempt to transfer (or replicate) some aspects of its in-house organizational capability across firm boundaries. The ability to replicate such capability is, in itself, also a capability. In the automobile industry, automakers may send their own engineers to the supplier's shop floor to help solve a problem with a specific component in order to meet the product launch date. They may provide training courses for suppliers' employees in techniques such as TWI, Quality Circles, Value Engineering, and simultaneous engineering. They may also ask a supplier to work on a specific production line for an extended period with a view to learning heuristics to achieve cost reduction, inventory reduction or quality improvement.

The organizational capabilities that are being replicated at suppliers consist of a hierarchy of practiced routines that are coherent (Nelson 1991, p.68). 'Routines' refer broadly to the way things are done in an organisation, and may include not only well-specified technical routines, but also 'the relatively constant dispositions and strategic heuristics that shape the approach of a firm to the non-routine problems it faces' (Nelson and Winter 1982, p.15). In so far as such routines involve an important element of interaction and coordination between individuals, organizational capabilities are not fully reducible to individual skills. Knowledge is typically distributed in different parts of the organization.

One important capability in supplier development is continuous improvement (or Kaizen). In a Schumpeterian or evolutionary context, firms may satisfice, in response to an uncertain and complex world. Such satisficing behaviour is dislodged by heightened performance aspiration and by re-igniting learning through continuous improvement (Winter 2000). The practice of continuous improvement amounts to an effort to re-ignite the quest for improvement in organizational routines 'so frequently that the flame burns pervasively and continuously' (Winter 2000, p.993), rather than starts and stops in relation to the identification and solving of a specific problem (Winter 1994, p.103). Continuous improvement is inherently firm-specific in its application and results, and therefore is part of the intangible assets for which no ready market exists. The distinctive and difficult-to-replicate character of such assets is central to the sustenance of a firm's competitive advantage. It also explains why firms differ, even in the same industry in the same country (Nelson 1991).

The organizational capabilities framework makes it possible to classify the content of supplier development programmes along the following two dimensions:-

- (a) *Type of capability*, classified into three levels: first, the most basic level of 'maintenance capability' (i.e. the ability to maintain a particular level of performance consistently), second 'improvement capability' (Fujimoto 1997, p.12)<sup>i</sup>, which affects the pace of performance improvements, and third the highest level of 'evolutionary capability' (i.e. capability for capability building) (Fujimoto 2000, p.246). This last is to be distinguished from 'dynamic capabilities' (Teece and

Pisano 1994) to the extent that the emphasis is less on 'adapting, integrating, and reconfiguring internal and external resources in response to changing environments' (Teece 2002) and more on the sustained accumulation of the other two capabilities. This, then, resembles dynamic capabilities in moderately dynamic markets, rather than in high-velocity markets, as elaborated by Eisenhardt and Martin (2000).

- (b) *Scope of activity*: ranging from supplier development activity focused around a model-specific component, to that for the whole factory or the whole company. The broader scope implies not just an expansion from a specific production line to a larger production area, but also an expansion to non-production areas (such as product development and capital investment decisions).

The most limited aim of supplier development is to intervene in order to teach 'maintenance capability' with respect to a specific component. At the other extreme, the most ambitious aim is for a company to replicate at its supplier a whole set of organisational 'routines' underlying its own evolutionary capability.

In Japan, key suppliers are given a consistent set of *incentives* to learn and acquire organizational capability from their customer companies. Suppliers benefit from relationships that are variously characterized as relational, obligational, trust-based and voice-based (Adler 2001, Dore 1983, Helper 1990, Macneil 1985, Sako 1992). Long-term trading induces investment in relation-specific skills (Asanuma 1989), a joint problem-solving approach adopted in developing 'black box' parts (Clark and Fujimoto 1991, Fujimoto 1997), and a clear rule for sharing gains between the automaker and the supplier (Smitka 1989, Macmillan 1990). Less noted in the literature, but clearly demonstrated in the empirical section of this paper, is that the automaker's transfer of its capability requires not only resource commitment but also a distinctive internal organizational structure. Despite these incentive-structuring mechanisms, there remain at least three obstacles to the replication of automakers' organizational capability by suppliers. Consequently, incentive structuring is a necessary but not a sufficient condition for facilitating suppliers to acquire organizational

capability. Differences in core capabilities to overcome these barriers to replication explain why firms in the same industry differ despite similarities in incentive structuring mechanisms.

First, the replication of organisational capability may be difficult due to the tacit nature of the knowledge to be transferred to suppliers. Manuals (i.e. for standardization and codification) may exist, but typically, hands-on instruction must accompany classroom teaching, which makes the process of replication labour-intensive (e.g. sending engineers to spend a significant amount of time on the supplier's shop floor) and expensive (because economies of scale are difficult to exploit). In this study, we may conjecture from the chosen mode of supplier development (e.g. shop floor visits vs. seminars) what the automaker's presumed degree of tacitness concerning that which it is purporting to teach. The more automakers rely on teaching through the practice of routines rather than the representation of routines, the more complete the replication process is likely to be. Moreover, doing and teaching are different things. In a craft skill context, some are excellent at doing but are *unwilling* to teach a trick or two because that would undermine one's power. More noted in the recent management literature on knowledge is the fact that some are excellent at doing but are *unable* to teach because of the tacit and complex skills involved: 'we know more than we can tell' (Polanyi 1967, p.4). How can the amount of 'telling' be increased to match the level of 'knowing'? This study shows empirically that the firm's teaching capability is enhanced when there are opportunities for it to practice in different settings.

Second, replication may be problematic because of a high degree of interdependence among a firm's supplier development process and other processes in the organisation. It has been noted that: 'Recognizing the congruences and complementarities among processes, and between processes and incentives, is critical to the understanding of organisational capabilities' (Teece and Pisano 1994, p.544). Consequently, partial imitation of a few elements in a successful model may yield little benefits (Milgrom and Roberts 1995). For example, the 'lean production' model is essentially interpreted to apply to the shop floor. But 'lean production requires distinctive shop floor practices and processes as well as distinctive higher

order managerial processes' (Teece and Pisano 1994, p.543). This implies that as a cumulative process, there is an in-built bias towards automakers' strategy to broaden and deepen the scope of supplier development, as they extend their activities beyond shop floor improvement procedures.

Third, this strategy to extend the coverage of capabilities in supplier development programmes is at loggerheads with certain modes of corporate governance. A system of corporate governance shapes who makes investment decisions in corporations, what types of investments they make, and how returns from investments are distributed (O'Sullivan 2000). Supplier development involves the supplier company deciding to allocate resources for new physical investments and for learning new skills. But since the voice and the input of the customer company as a teacher are pertinent in such decisions, the notion of the supplier company as an autonomous unit of organizational control is potentially undermined. When supplier development concerns basic 'maintenance capability' for a specific component, the customer company's input tends to be clear, and a rule for sharing gains from a joint performance improvement effort eliminates the need to negotiate each time gains are made. But when it concerns the teaching of 'evolutionary capability' with a wide scope for activity over a long period of time, the customer company's contribution becomes less easy to specify. In such cases, even among innovative enterprises, the notion of the customer company as a semi-insider stakeholder in the supplier company has to be accepted for such supplier development intervention to be considered not too intrusive. In the absence of legitimacy of such customer company role, the replication of organisational processes across legally distinct units of organizational control may be constrained by the fear that suppliers' financial (and more broadly managerial) autonomy may be compromised in the process of replication.

## **2. Case Studies at Toyota, Nissan and Honda**

### **Toyota**

Toyota is noted for two things that mark itself apart from Nissan and Honda. First, its internal organization for providing supplier development is decoupled. Toyota Production

System and Total Quality Control activities are taught to suppliers by different parts of the company. This bifurcated internal structure facilitates suppliers to accumulate their 'evolutionary capability' (i.e. capability for capability building) and lower level capabilities at the same time. Second, through Jishuken Groups (self-study groups), Toyota relies not just on on-to-one teaching of suppliers, but also on lateral learning amongst suppliers through the practice, rather than the mere representation, of capability.

#### *Origin of Supplier Development*

Toyota Motor Corporation's purchasing philosophy is enshrined in the 1939 Purchasing Rules which state: 'once nominated as Toyota suppliers, they should be treated as part of Toyota (as branch plants); Toyota shall carry out business with these suppliers without switching to others, and shall make every effort to raise the performance of these suppliers' (TMC 1988 p.76; Kyohokai 1994, p.18). But the post-war trigger for thinking more concretely about supplier development was the so-called enterprise group diagnosis (*keiretsu shindan*) conducted by the Aichi Prefectural Government during 1952-53 (Kyohokai 1967, pp.24-5, Wada 1991; see also Fujimoto 1997, p.76&p.212; Nishiguchi 1994, p.65). The public sector consultancy chose the Toyota *keiretsu* (in practice Toyota and its 21 key suppliers) as the unit to evaluate along four criteria, namely the existence of a management policy, productivity improvement, quality improvement, and the fulfillment of production plans (Kyohokai 1967, p.24). The consulting exercise resulted in a heightened expectation that Toyota provide assistance to improve suppliers' company-wide managerial capabilities.

In the 1950s, lectures, seminars and training courses for Toyota employees were made available to core supplier employees. For example, a 30 day lecture course on production management, organised by the Japan Management Association, was first held in 1955 for Toyota and supplier employees, and was repeated 20 times until 1967, producing 372 graduates (excluding Toyota employees) (Kyohokai 1967, p.32). These supplier employees learnt from others' factories: 'we made a round of Kyohokai member companies as well as Toyota's internal factories in order to conduct research into improving work methods. Task

improvements helped anticipate repeated pressures for cost reduction. So companies vied with each other to open up their own factory as a study site, and were eager to polish each other's skills' (Kyohokai 1967, p.32). There were also a whole series of lectures and seminars on quality control aimed at top and middle managers of supplier companies in Kyohokai, which eventually established its Quality Control Committee in 1961.

Despite these efforts, when Toyota won the Deming Award in 1965, JUSE (Japanese Union of Scientists and Engineers) pointed out the sizeable gap in quality standards between Toyota and parts suppliers (Nemoto 1983, p.151). Masao Nemoto was appointed to head the Purchasing Control Department (*kobai kanribu*), newly created in 1965, preceding the establishment of Taiichi Ohno's Operations Management Consulting Division (OMCD) (*seisan chosabu*) by five years. While Ohno's mission was to promote Toyota Production System (TPS) among suppliers, his lesser-known counterpart, Nemoto, was to diffuse Total Quality Control (TQC) to the suppliers. This is the origin of the bifurcated responsibilities for supplier development within Toyota (see Figure 1).

It is well understood that TPS, a system relentlessly focused on the elimination of waste, exposes quality problems through line stoppages and forces management to fix the root cause of the problem (Monden 1983, Ohno 1978). Less noted in the literature is the contribution TQC has made to the rapid diffusion of TPS across Toyota factories, not only by educating middle managers in quality control techniques but also by using Hoshin Kanri (policy deployment) to link the shop floor processes to the policies of higher level management. (Mr. Nemoto quipped that lean production is the Toyota way minus Total Quality Control (Shimokawa et al (eds) 1997, p.7). ) By extension, Toyota's suppliers benefited from the synergy resulting from combining TQC and TPS. The teaching of TPS led to suppliers accumulating their 'maintenance capability' and 'improvement capability', whilst the simultaneous teaching of TQC enabled them to make TPS sustainable throughout their operations, leading to a form of 'evolutionary capability'.

*OMCD's Diffusion of Toyota Production System*

The Toyota Production System was initially introduced to all Toyota factories in the 1960s. These factories demanded just-in-time delivery of parts, but a real effort to implement just-in-time production within supplier factories did not begin until the 1970s (Kyohokai 1994, p.91). The Operations Management Consulting Division (OMCD), established in 1970 as part of Toyota's production control function, facilitated a seamless transfer of knowledge about TPS between Toyota and its suppliers. Because OMCD is in charge of implementing TPS both within Toyota factories and at its core suppliers, the same methods, procedures, and heuristics are applied to internal and external factories by putting the same set of engineers in charge of both. The OMCD employs around 50 supplier development engineers, who have come up the ranks after in-company training placements in Toyota factories. Within Toyota, Factory Jishuken (*kojo jishuken*) -- an autonomous study group -- takes place as a culmination of education and training for Toyota's middle managers and first-line supervisors. They are considered the most important repository of Kaizen know-how on the shop floor (Ishida et al 1996, Nemoto 1995). Supervisors are given an incentive to make continuous improvements with concrete results, as they are required to regularly present Kaizen ideas in front of factory managers and top management (Ishida et al. 1997).

Jishuken Groups for suppliers to improve their shop floor by refining the application of TPS came about in the early 1970s, but were kept under wraps from external eye for a decade or two. By all accounts, Jishuken seems to have had an informal beginning with some suppliers requesting help from OMCD. By the late 1990s, there were nine Jishuken Groups in all, two for body makers (9 factories) and seven for parts manufacturers (47 factories). The total is therefore 56 factories belonging to 52 enterprises, accounting for 80 per cent of all purchasing spend by Toyota. Interestingly, some of these suppliers also have an OMCD-like operation in-house, cascading downwards the practice of diffusing TPS within the company and to smaller second-tier suppliers (Imai 1985). Toyota has given regard to geographical proximity and the absence of direct competitors in forming these groupings. Such

considerations are deemed important for intensive interaction and sharing of know-how during Jishuken sessions.

Every calendar year, Jishuken activities are carried out within the broad policy direction issued by OMCD (the 1998 focus, for instance, was to adapt to model mix changes and output fluctuations in the age of low demand). Within such a framework, each Jishuken company chooses a specific theme in discussion with OMCD, and identifies a specific factory area for study by the Group (JECO, a medium-sized instrumentation supplier, chose to focus on parts and finished goods logistics). Every year, each supplier company hosts a study over a two months period. The study session begins by setting concrete performance targets in terms of shop floor indicators, such as productivity (in terms of the number of process steps), cost reduction, and inventory turns (for example, JECO's targets were to reduce the inventory to meet order fluctuations by 54% (from 0.65 days to 0.30 days) and to reduce the inventory of rotors by 95% (from 0.67 days to 0.03 days)). The senior OMCD engineer in charge visits a supplier company under study around three times during the two months period and generally makes severely critical observations, whilst more junior OMCD engineers visit the company at other occasions to give more detailed guidance. Jishuken Group members meet once a week to put forward concrete Kaizen ideas. .) A typical Jishuken gathering would consist of around 30+ people, as each supplier company nominates five participants. Most of the ideas are implemented by the host company before the two months are up. (For example, at JECO, 222 of the 248 Kaizen ideas put forward in total were implemented, an implementation rate of 90%. Many of the ideas concerned the use of Kanban and the clarification of rules, for instance, when defects were discovered at the point of shipment. Of the 222 implemented ideas, 85 originated from within JECO, whilst 135 came from other companies within the same Jishuken Group. Some of the unimplemented ideas are taken up by JECO's in-house shop floor study groups, Evidence that Kaizen activity is sustainable within JECO beyond the stimulation given by the Jishuken Group. At the end of the year, all the Jishuken Groups gather in one location to make presentations of their year's

achievements. Written documents of those achievements are compiled and handed out to all participants.

Besides Jishuken, Toyota's OMCD also provides individual assistance to suppliers on an if-and-when-necessary basis. For instance, the purchasing department may request assistance for a supplier with a pre-production problem in fixing its component quality. What are the relative advantages and disadvantages of bilateral assistance and group activities like Jishuken? An OMCD manager gave the following eloquent answer.

Individual assistance is good whenever we are looking for quick results. When a supplier's profits have plummeted suddenly, or when a supplier is not keeping up with the launch of a new model, we send in our trained experts and tell everyone to watch quietly. But this short-term, yet deep, intervention requires a tremendous amount of resources on our part. More likely than not, suppliers feel they have improved by doing what they are told, but do not understand why, and things come to a halt when the experts go home. By contrast, Jishuken is good for developing and training people, both at the suppliers and at Toyota. In order to make improvements towards a set of targets by everyone putting their ideas forward, there are various obstacles to be overcome along the way. It would most certainly be quicker for an expert to take a lead and provide answers, but this would not result in developing the skills of those who are led. The strength of the Toyota Production System lies in creating as many people who can implement and put into practice the TPS on their own as possible. So the most important thing for the survival of TPS is human resource development. But also there is no point in holding study group sessions without concrete results, because then companies would not be profitable. So we do put serious pressure for Jishuken Groups to meet the targets.

Thus, Jishuken is a closely knit gathering of middle-level production technologists from a stable group of companies, who jointly develop better capabilities for applying TPS through mutual criticism and concrete application. The two modes of delivery by the OMCD, namely the Jishuken group activities and individual assistance, are synergistic, in that the

former gives suppliers the space to experiment and explore on their own while the latter provides a top-down quick solution by Toyota experts, which on its own may discourage learning. Jishuken also has the benefit of developing Toyota's own personnel in teaching tacit skills. Both modes of supplier development give Toyota enormous access to the detailed cost structures of its main suppliers. This contributes to the sustenance of Toyota's core capability to engage in target costing, and to the retention of manufacturing know-how for components which Toyota does not produce in-house. Thus, there is a fine line to be drawn between monitoring and learning (Beaudet 1998, Hisatake and Negishi 1996).

#### *The Purchasing Department's Diffusion of TQC*

Like the OMCD, the Purchasing Department also relied on bilateral and multilateral modes of supplier development. In the multilateral mode, the Department has been in charge of the supplier association, Kyohokai, which, despite its ever-expanding membership, remains a forum for imparting and sharing information in the supplier community. They hold regular seminars, study group meetings, training courses, exhibitions and presentations of members' achievements in various matters including cost, quality, delivery and development (Kyohokai 1994, Sako 1996).

More concrete individual guidance is given to suppliers that aspire to obtain the Toyota QC Award, established soon after Toyota won the Deming Award in 1965 to motivate suppliers to adopt TQC (Kyohokai 1994, pp.74-5; Nemoto 1978). As of September 1996, a total of 44 suppliers obtained the Toyota QC Award. The Quality Technology Section of the Purchasing Planning Department offers hands-on guidance in Hoshin Kanri, quality assurance, cost control, Genba Kanri, delivery management and so on. Because of this traditional TQC focus, the Purchasing Planning Department defines supplier assistance to be about capability enhancement (*taishitsu kyoka*, 'the strengthening of one's constitution' in a literal translation). This is necessarily a long-term undertaking, involving assistance in marketing, cost and investment planning, cost control, process improvements, and quality improvement.

More recently, however, an urgent task surfaced with the recession in the 1990s. Whereas in 1988, 57 out of the 77 major suppliers (with 20% or more sales dependence on Toyota) saw their revenues and profits increase, by 1993, only 3 were experiencing increases while 57 were facing declining revenues and profits. Toyota responded by creating in 1993 a Kaizen Promotion Section within the Purchasing Planning Department, staffed by 21 employees (15 of whom came from factory-level production engineering sections, while the rest had cost and accounting expertise). The main task of this new section is to help suppliers secure profits in the short run by various means including cutting pay and freezing investment. In effect, the Purchasing Planning Department's supplier assistance is two pronged, one aimed at the short-term recovery of loss-making suppliers and the other for longer-term capability enhancement regardless of profitability problems.

The account so far leads to a question about how the OMCD relates to the Purchasing Department when dealing with the same set of core suppliers. The nature of coordination between the OMCD and the Purchasing Planning Department is informal, based on personal networks. No organisational procedures exist for informing each other's work. According to an OMCD manager:

When we go into a supplier, we do not put the purchasing function at the forefront. We can see everything at the supplier company including the detailed breakdown of costs. If rationalization is for the sole purpose of passing on the gains to the purchasing department, suppliers would rather not make any improvements. So we do not let the purchasing department know how much productivity improvements a particular supplier has made as a result of our intervention.

Similarly, a Purchasing Planning manager was confident that most suppliers are reassured of the absence of a direct link between supplier assistance and price negotiations:

No supplier would do Kaizen if such a link is made. Within Japan, we tell the suppliers, don't worry, there is no need for such fear. If improvements were made with OMCD assistance, the OMCD would never pass on to purchasing the information with a view to reflecting it in component prices.

A supplier, participating in Jishuken and receiving assistance from the Purchasing Planning Department, reinforced this view:

There are occasions, like with VA, when Toyota says let's split the gains where they relate directly to markets. But we feel that Toyota provide guidance, quite consciously bringing our attention to other aspects from which we can gain for ourselves regardless of Toyota. They tell us from time to time to direct our Kaizen effort to these aspects.

In effect, the supplier in question is allowed to keep the gains from an OMCD intervention.

To summarize, Toyota's OMCD has a separate existence from the Purchasing Department, facilitating a smooth transfer of know-how between internal factories and supplier factories, and giving suppliers an incentive to enhance their 'evolutionary capability' for the long-term rather than to seek a quick fix for commercial advantage. The OMCD and the Purchasing Department, separately, emphasize the need for both short-term fixing of problems and long-term capability enhancement. The resulting array of supplier development channels, from group-based activities to individual assistance, enables Toyota to ensure that both explicit and tacit knowledge is communicated to its core suppliers (Dyer and Nobeoka 2000). Moreover, suppliers, by being taught TPS and TQC at the same time, are able to exploit the synergy in sustaining continuous improvement.

## **Nissan<sup>ii</sup>**

Like Toyota, Nissan's Yokohama plant received an enterprise group diagnosis in 1953. The diagnosis revealed that many of the owner-managers of Nissan's subcontracting firms came from technical backgrounds, and lacked interest in management issues. The diagnosis report recommended that Nissan provide guidance for its suppliers in 'clearer management direction, better organization structure, managerial planning and scientific management principles, improved time management, and more attention to production management' (Ueda 1997, p.226). In reality, however, Nissan's assistance was initially restricted to developing 'maintenance capability' on the shop floor, and it was not until the

1980s that broader managerial processes (including TQC) – amounting to ‘evolutionary capability’ -- were taken up seriously as a topic for supplier development. As described below, the history of Nissan’s supplier development activity is marked by (a) significantly early starts in adopting new techniques, but also by (b) discontinuities in initiatives for Nissan’s internal factories and those for its suppliers.

### *Discontinuous History of Diffusing Synchronized Production and TQC*

Synchronized production (*doki seisan*) is Nissan’s own philosophy and method for a demand-pull low-buffer production system, dating back to the early 1960s. As a management philosophy, it sought to exploit the existing imbalance between the firm and the environment as an opportunity for making continuous improvement. This philosophy was to be implemented in three stages: (a) through line balancing to improve the efficiency of machinery and manpower; (b) through balancing production processes with processes which precede and follow production; and (c) through synchronizing the production system with a future management vision (Takarakai 1994, pp.116). Juzo Wada, heading the purchasing department in the 1960s, is credited with devising the idea, and effected a ‘synchronization experiment’ in 1963 to spread this production system to core suppliers through the supplier association, Takarakai (Nissan 1965 p.388; Takarakai 1994, pp.116). The experiment eventually faded away, and Nissan’s purchasing function re-started supplier development with a focus on APM (Action Plate Method) in the 1970s and 1980s, and on Capability Enhancement Activity in the 1990s. The mid-1990s also saw Nissan establish a Synchronized Production Promotion Department in order to diffuse synchronized production – called NPW (Nissan Production Way) from 1994 -- internally to Nissan’s factories. Thus, unlike at Toyota, the function responsible for diffusing synchronized production internally is separate from that for suppliers.

There is a similar de-linking between Nissan’s internal efforts and actions for suppliers in the area of TQC. Nissan was awarded the Deming Prize as early as in 1960, and used the supplier association, Takarakai, as an organ to provide education and training on

TQC to member suppliers (Udagawa et al 1995, p.86). But Nissan tended to treat the Deming Award as an end in itself, and did not continue to nurture internal expertise nor diffuse TQC to suppliers. In fact, it took Nissan 22 years before it established the Nissan QC Award for members of Takarakai in 1982. In the meantime, Nissan provided individual assistance to suppliers in quality control techniques, putting an emphasis on product quality. With the start of the teaching of company-wide TQC to suppliers, just over 30 suppliers obtained the Nissan QC Award, but only 6 years on in 1988, the award was suspended. In the 1990s, Nissan took a renewed interest in improving product quality, and newly established a TQM Promotion Department to revive TQC within Nissan.

#### *From Group-based to Individual Supplier-based Assistance*

Nissan, like other automakers, has classified its component suppliers using multiple gradations. Initially, the core group was Nissan's main supplier association, Takarakai, consisting of around 100 member companies throughout its history (1958-1991). In 1966, a second supplier association, Shohokai, was formed as a looser gathering of bigger and more independent suppliers. In 1969, Takarakai introduced a distinction between activities for all members (e.g. lectures and QCC conferences) and 'autonomous activity' by six newly formed committees, each consisting of 10 or less select member firms producing similar products (Takarakai 1994, p.58; Udagawa et al 1995, p.88). These committees were very active in sharing information and ideas through mutual factory visits and study groups. Nissan's purchasing function was in charge of promoting supplier association activities by providing direction, advice and expertise.

In 1983, Takarakai's organization was restructured again by creating (a) a joint committee to seek common themes across the six committees, and (b) five specialist functional committees (in TQC, education, logistics, health & safety, and the promotion of Nissan cars) (Takarakai 1994, p.92). Thereafter, the locus of activity shifted from the six committees to the specialist functional committees. Takarakai activities were streamlined further, as members felt that Takarakai had run its course. The most active part of Takarakai

that remained was a Specialist Committee for Capability Improvement (*taishitsu kaizen senmon iinkai*), whose origin lay in the TQC committee of the 1980s (Takarakai 1994 p.111). When Takarakai disbanded itself in 1991, this committee was also disbanded, and the Capability Enhancement Promotion Committee was established under the auspices of Nissan's Engineering Support Department. In order to be member of this Committee, suppliers had to be more than 20% owned by Nissan, over 30% of the supplier's sales turnover go to Nissan group companies, and the total annual sales to Nissan must exceed 20 billion yen. Although the 25 suppliers that met these criteria are expected to learn from each other, Nissan's assistance is largely on a one-to-one basis (see below).

#### *Broadening and Deepening Supplier Development Activity*

Nissan has two foci of supplier development activity, namely component-based assistance and factory-wide assistance. The former involves the teaching of various techniques to improve cost, quality, delivery and development, and is captured most recently by Saimal Activity. The latter, factory-wide assistance, is known as Capability Enhancement Activity, and incorporates synchronized production, TPM, and Genba Kanri.<sup>iii</sup> In the mid-1990s, it consisted of a three year programme to implement synchronized production. The aim in the first year was to improve the use of direct labour, in the second year to improve indirect labour, and in the third year to cut overheads. Starting initially with three factories from three supplier firms, there were 40 factories from 12 companies participating in this programme by 1997. Typically, a supplier specifies a model factory, which is diagnosed and improved with intensive help from Nissan engineers; 3-4 engineers visiting the factory 4 times a month is a guideline, and it is known for a Nissan engineer to be resident at the supplier for 3 months. Beyond this stage, the supplier receives a visit from a Nissan engineer twice a month. Not only is the supplier expected to expand the scope of his activity within the model factory (from direct to indirect labour, etc), it is also expected to apply what has been learnt at the model factory to another factory.

Nissan's Capability Enhancement Activity places great emphasis on evaluation and diagnosis. The thinking here is that without concrete evaluation measures, Nissan cannot provide effective assistance, nor would suppliers feel convinced of the need to make improvements. Since the mid-1990s, Nissan has developed a whole series of measures for suppliers concerning (a) their financial performance, (b) data on quality, cost and delivery, and (c) evaluation of systems governing components, factories, and companies. For example, component-based evaluation involves benchmarking 90 component types of 200 Japanese companies, along six criteria, namely quality (e.g. in-process defect rate), reliability (e.g. equipment breakdown), flexibility (e.g. die change time), speed (e.g. cycle time), economy (e.g. output per time unit), and continuity (e.g. the proportion of processes which are continuous).

Since 1995, up-to-date performance measures of the 25 core supplier companies are displayed in a showroom located within the Engineering Support Department. Moreover, there are three meetings every year for the 25 companies, one at the company president level and the other two for manufacturing directors. The meetings have the purpose of sharing information about evaluation data and of creating a consensus about future directions. The sensitivity of the information and the presence of direct competitors within the group of 25 suppliers require much care and attention in the way it is handed out. But on balance, Nissan's Engineering Support Department believes that the disclosure of evaluation data has a beneficial effect of stimulating healthy rivalry for improvement. Besides the meetings of the 25 suppliers as a whole, there are other smaller group meetings of suppliers located in specific geographical areas, when suppliers make presentations of Kaizen examples from their factories. These are fora for exchanging ideas about successful results, but not where joint studies and problem-solving (a la Toyota's Jishuken) are carried out by supplier groups.

Saimal Activity (Saimal standing for 'simultaneous' in simultaneous engineering) is a 1990s programme to help suppliers improve the component development process. The timing coincides with Nissan's drive to adopt simultaneous engineering as a major corporate vehicle to improve its performance (Okurasho 1997, p.71). The component technology group of

Nissan's Engineering Support Department is in charge of developing a number of tools (such as the Saimal Job Plan spelling out detailed steps in developing a part for a new model) and evaluation measures to assess suppliers' capability in managing the component development process. Saimal Activity has targeted specific components, particularly (a) components which tend to have unstable interface quality, such as lamps and weather strips; (b) components which suffer from many design changes before Job 1, such as harnesses, carpets, seats and door trims; and (c) expensive components whose costs are difficult to reduce, such as metal pressings, air conditioners, door locks, air bags, steering wheels, and engine and transmission parts. The Engineering Support Department evaluates whether the Saimal Activity has taken root at the supplier companies, by monitoring and appraising not only outcomes (in terms of quality, cost and delivery) but processes. The latter involve such things as whether the Saimal Job Plan has been adhered to or not, whether in-company education system is adequate at the supplier, and whether the supplier takes an initiative to make suggestions to Nissan. Only if a supplier scores highly on both outcomes and processes would it graduate from the stage of receiving regular visits by Nissan engineers.

To summarize, as at Toyota, Nissan's supplier development activity has broadened and deepened considerably over time, starting with teaching 'maintenance capability' in the 1960s to replicating higher level capabilities in broader areas (e.g. component design and development). Nevertheless, significant differences exist between Nissan and Toyota. First, Nissan's supplier development is much more individual company based than at Toyota, relying less on lateral inter-supplier learning. Second, Nissan suppliers share ideas and achievements through presentation meetings, but not through the practice of joint problem-solving. Consequently, less tacit knowledge is shared between Nissan suppliers. Third, at Nissan, there is a de-coupling of the function to diffuse capabilities within Nissan's own operations and the function to teach the same capabilities to key suppliers. This means that the replication of internal capabilities at suppliers may not be as smooth as at Toyota. But Nissan has strengthened its unified structure for providing supplier development programmes through its Engineering Support Department, doubling its size in the 1990s from

around 40 to over 80 engineers, and incorporating activities hitherto carried out by other functions such as quality and logistics. Nissan operates on the belief that a single point of contact for suppliers promotes a consistent set of development activity starting from the comparison of suppliers' technological standards, the setting of improvement targets, the implementation of programmes, and the reflection of improvements made in the next round of supplier selection.

## **Honda**

### *Honda's Philosophy of Supplier Relations*

Honda espouses free competition, equal partnership, and suppliers' managerial self-reliance as three fundamental principles in purchasing. These principles arose out of necessity and experience of being a motorcycle firm that entered the auto sector late in the 1960s. Free competition means that as a matter of policy, Honda is to buy products from anywhere in the world as long as they are good and cheap. Equal partnership means the avoidance of heavy-handed tutelage that has typified the relationship between Toyota and many of its long-standing loyal suppliers. Supplier's self-reliance implies balancing responsiveness to Honda's needs with a sufficiently diversified customer base.

Honda places its supplier development activity in the context of this purchasing philosophy. Its purchasing department sees its history of supplier development as reflecting a shifting balance between cooperation and competition, with equal weights in the 1970s, in favour of cooperation in the 1980s, and back towards competition in the 1990s. This seesaw began after 1973 when some of Honda's smaller suppliers found themselves at risk with a large reduction in Honda's orders. The recession since the 1990s poses a similar risk for some suppliers, but before Honda feels able to throw them out to face global competition, it is devoting resources to bring them up to world-class level of competitiveness.

### *Multiple Channels of Supplier Development*

Honda's supplier development activity may be traced back to the formation of study groups in the aftermath of the first oil shock in 1973. By this time, Honda had nurtured a core group of suppliers with either shareholding or heavy trading linkages with Honda, in order to cope with a sixteen-fold increase in car production in its initial ten year history. Suddenly, with no growth prospects for the auto industry, Honda realized the need to cut costs to survive. Since 50-60% of Honda's purchased parts costs were in materials, attention naturally turned to cutting the costs of materials. This material-focused activity eventually extended to examining production processes and capital equipment. At first, a team of seven Honda engineers from the Purchasing Department identified a group of 8 supplier companies, and started implementing changes, starting with cleaning the shopfloor and changing the factory layout. This activity came to be known as SBP ('Soft Best Position') as part of the Maru A Plan (1974-79).

Typically, a model line was chosen at a supplier. At first, the Honda team made essential changes and showed what could be done, so as to convince the supplier that making those changes were worthwhile. According to a leading member of this initial team, talking about a typical supplier's shopfloor:

It was dirty, it was messy and there were so many problems. The starting point was what to do with all these problems. Honda realized that changes had to be made to compete globally, and that its affiliates were not keeping up with the competition. Once the main action points were listed, it became clear that suppliers would not be able to implement them if they were just told what to do. There was no choice but to work together. So we started by asking a supplier company to form a joint Kaizen team with Honda engineers.

Once such a joint team was formed, the Honda engineers were fully active in implementing shopfloor improvements, starting with 3S. Moreover:

We chose to work on the thing that would have the greatest impact on profits or quality. The issue was how to make suppliers' top management realize that the

changes made would lead to greater profits or better quality, because once they realize this, things would run on an automatic pilot. We therefore had to work together to increase performance, and when that was achieved, Honda did not take away the fruit of the achievement. We entrusted this capital gain to the supplier management.

During the Maru A Plan period, a 50-50 sharing rule came into effect, and has been strictly adhered to ever since.

The shopfloor Kaizen activity on a chosen model line was followed by 'autonomous activities' by suppliers themselves. The activities focused on two extensions: applying what was achieved on the model line to other production lines in the supplier company, and forming a study group with other suppliers in the same sector to take turns to improve a model line at one of the suppliers. The Maru A Study Movement consisted of 68 suppliers, later rising to around 100. They were grouped into sectoral categories such as pressing, welding, plastic moulding, casting, forging, diecast, machining, and assembly. Honda's initial focus on materials, then on capital equipment in the form of HBP (see later), made the choice of this sectoral organizing principle seem natural. An alternative organizing principle of dispersing direct competitors in different group, as for Toyota's Jishuken, has the advantage of minimizing barriers to sharing know-how amongst direct competitors. But Honda's group arrangement has the advantage of focusing on sector-specific technology. 'There is no point in talking to the machining group about plastic moulding. The machining group must discuss what has to be done to become No.1 in the world of machining, while the plastic moulding group discusses what it takes to be No.1 in that sector', explained Honda's purchasing manager.

#### *From Soft BP to Hard BP and SSP: Broader and Deeper Supplier Development Intervention*

The core supplier development activity at Honda has been BP. BP, when the term was devised in the mid-1970s, stood for Best Position, although later in the 1980s it came to be various things, including Best Practice, Best Process, Best Performance, Best Profit and so on,

particularly when applied to Honda of America Manufacturing (MacDuffie and Helper 1997). Within BP, there is also a distinction between SBP and HBP, which is very well known within Honda and the community of Honda suppliers. The two may be distinguished as follows.

1. Soft BP is achieved through changes that can be made without spending money (e.g. 3S), while Hard BP is achieved by making new capital investment.
2. Soft BP involves changes made after Job 1, while Hard BP starts from pre-production stage, around 2 years prior to Job 1.
3. Soft BP results in *kaizen* (small improvements), while Hard BP results in *kaikaku* (larger jumps in performance improvement). For instance, a stamping press speed is made faster these days by relying on two speeds in a stroke, a fast speed until the press is close to the metal, and a slower speed when the press actually touches the metal sheet. A large jump in performance was achieved when new investment was made to incorporate this two-speed stamping idea.

SBP originated in the post-1973 oil shock effort, while HBP became popular after the 1985 yen appreciation and the ensuing investment boom. HBP started towards the end of the Maru B Plan (1984-86), when Honda demanded a 15% cost reduction from its suppliers over the three years. Since there were limits to how much changes one could make after Job 1, attention turned to Hard BP before the start of production. The HBP Campaign in Japan was formalized by setting up study groups of suppliers and Honda factories. Capital investment, particularly in labour-saving automation using specialised transfer lines, was regarded as a solution to productivity bottlenecks. While rapid capital investment was a general trend in the late 1980s bubble economy, Honda's own philosophy concerning its production system – particularly the idea of increasing line speed and shortening the lines by relying on specialised functional robots (Amikura 1989, 1992) – also fueled this tendency. With the benefit of hindsight, BP Campaign in Japan is therefore regarded as responsible for the expensive over-reliance on capital investment in Honda's supply chain.

During the 1990s recession, Honda shifted its emphasis away from Hard BP back to Soft BP, and sought less expensive improvements in work organisation, process layout, and

problems with second-tier suppliers. In this vein, Honda announced a new initiative called SSP (Slim and Solid Production) as part of its Fifth Medium Term Plan. SSP marks a departure from previous supplier development programmes at Honda in extending the scope of development from a production line to the entire supplier company. A three step development is envisaged, first efficiency improvements in the production line, second in the product development system, and third in the management system so that it can expand sales and invest overseas. One Honda supplier development engineer is in charge of 3 SSP suppliers, and spends full-time guiding these three firms. Each SSP supplier appoints a LPL (Large Project Leader) and a PL (Project Leader), who are involved in setting performance targets that become part of the supplier's management plan. Linking the supplier's improvement activities to a company-wide management plan at the supplier may be seen to be the replication of Honda's own practice of linking supplier development programmes to its medium-term (three year) business plans.

Honda's expansion in the scope of supplier development has been facilitated by changes in internal organization structure. 1974, the year when Honda formally began its supplier development activity, also saw the establishment of a supplier development support team at the HQ Purchasing Department, which later became the Purchasing Technical Centre. The HQ Purchasing Department incorporates the Purchasing Quality Centre and the Purchasing Technical Centre, the two centres taking a lead in supplier development. The Purchasing Technical Centre (initially with 7 engineers in 1974, increasing to 58 engineers by 1997) corresponds to Toyota's OMCD and Nissan's Engineering Support Department. Since the early 1990s, these centres are located at Honda's Tochigi site, which also has the product development function, just like at Nissan Technical Centre, in order to intensify coordination between purchasing and the design and development function. Maru I Study Group, a supplier forum for promoting concurrent engineering and the use of on-line links as a tool for management decision making, is predicated on such close cross-functional coordination.

To summarize, one may conjecture that little supplier development would follow from Honda's purchasing philosophy of open competition and equal partnership, if taken at

face value. In reality, however, Honda's supplier development activity started after the 1973 oil shock, and looks similar to Nissan's and Honda's in using both individual-based shopfloor assistance and study groups. Moreover, the content of Honda's supplier development activity has broadened and deepened over time, ultimately addressing the supplier's company-wide capability. This is evident in the progression from Soft BP to Hard BP, and the setting of SSP performance improvement targets as part of suppliers' business plan.

### **3. Comparisons and Discussion**

Figure 2 summarizes the main supplier development activities at the three Japanese automakers, by juxtaposing them along two axes identified in Section 1, namely the type of capability taught to suppliers and the scope of activity. This section discusses three things with reference to Section 1's framework: (a) similarities among the three companies' organizational capability in supplier development, (b) how the three companies differ in this respect, and (c) the issue of replication of such supplier development systems outside of Japan.

#### *Common Features of the Three Companies*

- (1) *Multiple channels of supplier development are offered, in order to transfer both explicit and tacit knowledge.* Each automaker has an array of supplier development programmes, ranging from individual assistance to group-based assistance, from classroom teaching to joint-problem solving in concrete settings. Different programmes also have different aims, ranging from short-term fixes to instill 'maintenance capability' to the long-term development of 'evolutionary capability'. Multiple channels satisfy two aims. First, they ensure that both explicit and tacit knowledge are transferred to suppliers. All three companies expend a considerable amount of resources (50 – 80 engineers) to teach suppliers in a hands-on manner, reflecting their belief that tacit knowledge can be replicated only through this mode of teaching. Second, multiple channels help to achieve a balance between self-learning (or mutual learning amongst suppliers) and more heavy-

handed assistance for immediate tangible results. Toyota has achieved this by making the OMCD and the Purchasing Planning Department separately responsible for supplier development, and by complementing individual assistance with Jishuken groups.

Nissan and Honda also give individual assistance and facilitate study groups for their suppliers.

- (2) *The scope of supplier development activity has become broader and deeper over time. Starting with the enterprise group diagnosis at Toyota and Nissan in the mid-1950s, the automakers were expected to nurture their suppliers in a holistic manner. This meant not just teaching a toolkit of shopfloor Kaizen techniques but teaching suppliers a modern management control system, most tangibly in the form of Total Quality Control. Even at Honda which did not attempt to spread TQC to its suppliers, the linking of performance improvement targets to business plans (esp. in HBP and SSP) has ensured a company-wide commitment at the recipient supplier companies. In practice, all three companies started with assistance in shopfloor improvements. But the case studies show that over time, their activities extended to areas outside the shopfloor, into product development processes and management systems (see Figure 2). This broadening of the scope of supplier development is due to the complementarity in the hierarchy of organizational processes, notably between TPS and TQC, or between pre-production and post-production processes in simultaneous engineering.*
- (3) *Corporate governance at supplier companies has been able to sustain the voice of customer companies as legitimate semi-insiders and the appropriation of gains from learning new capabilities. As Toyota, Nissan and Honda broadened the scope of supplier development from shopfloor improvements to addressing suppliers' company-wide business plans, they generally encountered no barriers to suppliers opening their books for advice. Suppliers' trust of customer companies lay in the latter's competence as teachers, but also in devising a clear set of rules for sharing specific gains from short-term intervention, and for letting suppliers appropriate wider gains from long-term capability enhancement.*

### *How Firms Differ and Why Differences Matter*

The three broad similarities listed above skate over some significant differences among the three automakers. These differences matter to the extent that they affect the nature and sustainability of the mechanism for transferring capabilities to suppliers. In particular, Toyota differs from Nissan and Honda in at least two ways.

- (1) *Toyota has a distinctly different internal organizational structure for delivering supplier development from Nissan and Honda, relying on decoupling the teaching of Toyota Production System and Total Quality Control.* Toyota's OMCD is in charge of diffusing TPS, whilst the Purchasing Department is responsible for diffusing TQC to suppliers. This bifurcated structure proved to be advantageous in giving suppliers the opportunity to learn about TPS as though they were extensions of Toyota's internal factories, shielded in part from the Purchasing Department's commercial negotiations. At the same time, TQC helped diffuse TPS within each supplier company, contributing to the self-sustainability of capability-enhancement activity. By contrast, the establishment of Nissan's Engineering Support Department and Honda's Purchasing Technical Centre led to the incorporation of supplier assistance in various arena (including quality, logistics, product development, etc.) within the purchasing function. The centralized unified structure has the advantage of making suppliers have a single point of contact for consistent guidance, but is accompanied by the potential danger of creating a barrier between learning within Nissan's or Honda's internal operations and learning by suppliers.
- (2) *Toyota has the most systematic institution for inter-supplier sharing and learning of tacit knowledge, in the form of Jishuken (self-study) Groups.* Although all three companies created small groups of supplier companies to engage in joint study at different times, Jishuken Groups, each with several supplier participants, truly share the know-how in the practice of problem-solving, while those at Honda and Nissan tend to share successful solutions mainly through presentation meetings and factory visits. The focus on the latter assumes that much can be communicated through the representation, rather than

the practice, of routines. At Toyota, Jishuken Groups contain no direct competitors, whereas Honda and Nissan group suppliers according to their component sector. Know-how sharing is more likely to take place among suppliers in the absence of direct rivalry in business.

These two differences between Toyota on the one hand and Nissan and Honda on the other are reinforced by differences in the companies' policies towards suppliers. Toyota and Honda lie at the two extremes in the spectrum of purchasing philosophy, from organizational commitment to market competition, with Nissan hovering in-between. One of the manifestations of this difference in purchasing philosophy is that Honda does not have a supplier association, in the way Toyota and Nissan do. The supplier association constitutes a relatively stable group, and represents the entire population of recipients of supplier development assistance of some shape or form (Sako 1996). However, within this group of long-term suppliers, each automaker clearly distinguishes between the inner core of suppliers to which *processes* for 'capability enhancement' are taught in a hands-on manner, and the rest who are mainly given *incentives* to make improvements through long-term customer commitment. This distinction ensures that tacit knowledge is shared only with the inner core. This inner core ranges from 25 companies at Nissan and 52 at Toyota, up to 63 at Honda (see Table 1 for a summary).

The inner core group of suppliers may be regarded as within the boundary of the focal capability-based firm, in so far as common language and processes promote knowledge sharing within that boundary (Kogut and Zander 1992). At Toyota, OMCD ensures that Toyota factories transfer capability and learn from each other, and the inner core suppliers of Jishuken Groups learn from each other in the same fashion. Here, the long-term integration into Toyota's production network, rather than share ownership *per se*, is the key to establishing shared goals between the automaker and the suppliers. Toyota has been able to establish the most stable set of inner core suppliers to which the same teaching (of Toyota Production System) has been applied over three decades. Toyota's capability to sustain such cumulative effort in supplier development, as compared to a more discontinuous starts and

stops in development efforts at the other two automakers, must be in part a consequence of the greater organizational integration of inner core suppliers into Toyota than at Nissan or Honda.

*Replication outside Japan?*

The organisational capabilities perspective points to the root cause of the difficulty in replicating the Japanese automakers' supplier development capability outside of Japan. Apart from (a) differences in historical trajectories and (b) tacit and difficult-to-codify knowledge contained in what is taught to suppliers, the enlarged scope of supplier development activity renders the replication of the whole system more difficult and unlikely. This is a serious point, indicating a deeper current that goes against the more superficial trends in convergence towards 'partnership'-based supplier relations in North America and Europe (Helper and Sako 1995; Sako, Helper and Lamming 1995).

The IMVP supplier survey<sup>iv</sup>, conducted by the author in collaboration with Helper, asked suppliers how their customer company would react if a competitor offered a lower price for a product of equal quality. An increasing proportion of suppliers said their customers would 'help them to match a competitor's effort' (from 39% in 1990 to 81% in 1994 in the UK, 33% in 1990 to 53% in 1994 in the rest of Europe, and from 34% in 1989 to 53% in 1993 in North America). Japanese suppliers that expected their customers to offer help, by contrast, declined from 45% to 40% of the total. But 18.7% of Japanese suppliers continued to receive long-term supplier development assistance ('customer company provided personnel who worked two weeks or more on suppliers' shopfloor to improve its processes'), while the proportions were 9.6% in North America and 6% in Europe. This is one indication that when suppliers answer 'customers help match a competitor's effort', they mean different types of help. Some help is for the long-term development of a supplier's capabilities. Others are more of a quick fix. An example of the latter is General Motor's PICOS programme, a one week shopfloor Kaizen workshop which is rarely repeated for the same supplier. Thus, even with the diffusion of stable supplier relationships, supplier development in North America and

Europe may continue to have a less ambitious aim to improve suppliers' maintenance capability and perhaps their improvement capability, but rarely their evolutionary capability.

This less ambitious aim in supplier development is intricately related to differences in corporate governance between Japan, North America and Europe. In particular, key customer companies in North America and Europe do not have the same degree of legitimacy as in Japan, to act as semi-insiders that have a voice in how their suppliers might invest their resources. Moreover, suppliers in North America and Europe may distrust their customer companies' intention, to appropriate gains from short-term assistance through immediate price renegotiations. By contrast, in Japan, to a varying degree, suppliers are governed by mechanisms for customer-induced learning that are separated from shorter-term pressures for commercial negotiations. Honda's distinction between SBP and HBP provides a concise illustration of this point. In Japan, Honda initially targeted SBP, then moved onto HBP which required Honda to be intimately acquainted with its suppliers' investment and management plans. In the US, Honda of America Manufacturing (HAM) began to implement SBP in earnest in 1987, but faced suppliers' reluctance to disclose financial and other information to HAM particularly when it came to HBP (e.g. involving capital investment in new plants) (MacDuffie and Helper 1997). In the UK, also, HBP was said to be difficult because it was considered too intrusive for supplier companies' managerial autonomy. Some supplier company managers told Honda UK that they needed shareholders' approval for capital investment Honda recommended, an assertion that underlay their belief that shareholders were more legitimate than Honda as insiders to the supplier company concerned. A senior Japanese purchasing manager at Honda UK asserted: 'Various activities have started here, and UK managers have begun to understand the need for HBP in form, but not many have really felt the need under their skin as they continue to pay attention to shareholders.' Thus, corporate governance influences the breadth and depth of supplier development activity, through the customer company's status as 'insider' or 'outsider', and through the presence or absence of understanding about the appropriation of gains from learning by suppliers.

In conclusion, the contrast made in the current study is not so much just between short-term adversarial vs long-term cooperative supplier relationships, or between buying-in from a lean supplier vs creating one. Even with an apparent shift towards longer-term committed relationships, there remains an essential difference between a relationship in which the automaker is just a good source of information on 'best practice' and a situation in which the automaker actually teaches the know-how to enhance the supplier's organizational capabilities.

#### **4. Conclusion**

Social scientific research on supplier relations has been intricately linked to attempts at developing a valid theory of the firm that addresses both its internal governance and the boundary decision. From the supplier relations perspective, the theorizing was very much taken in two steps; first, firms decide over whether or not to make or buy (the boundary decision), and second, they decide over what sort of relations they wish to have with suppliers (arm's-length or relational). Transaction cost economics (TCE) was used for the first decision (Williamson 1975), whilst TCE was increasingly supplanted by other theories (e.g. on trust) to account for hybrid modes that lay between market and hierarchy (Adler 2001). This marriage of TCE with other theories has been uncomfortable, not least because TCE is primarily a static theory that has little to say about innovation and the internal governance of firms.

As a better alternative, the organizational capabilities perspective adopted in this article focuses on how firms can best draw their boundaries so as to enhance their capacity to accumulate their competence or capabilities. Accordingly, the boundary of the 'firm' is defined, not by law (and the share ownership patterns) nor exchange (i.e. calculations of transaction costs), but by considerations over the production of capabilities. As shown empirically, within the capability-based organization boundary, 'routines' exist for tacit knowledge to develop and replicate easily. This boundary, however, may go well beyond

legally defined corporate entities, if a buyer firm providing supplier development is allowed to take part in suppliers' investment decisions. Thus, the replication of organizational capabilities is not just a matter of collective-cooperative learning, by shielding actors from 'high powered' market pressures. It is also a matter of corporate governance.

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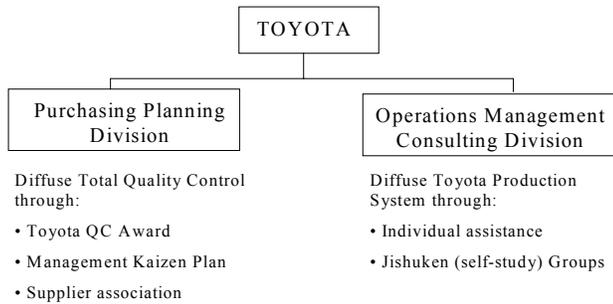
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**Table 1: Categorizing Suppliers at Toyota, Nissan and Honda in the 1990s**

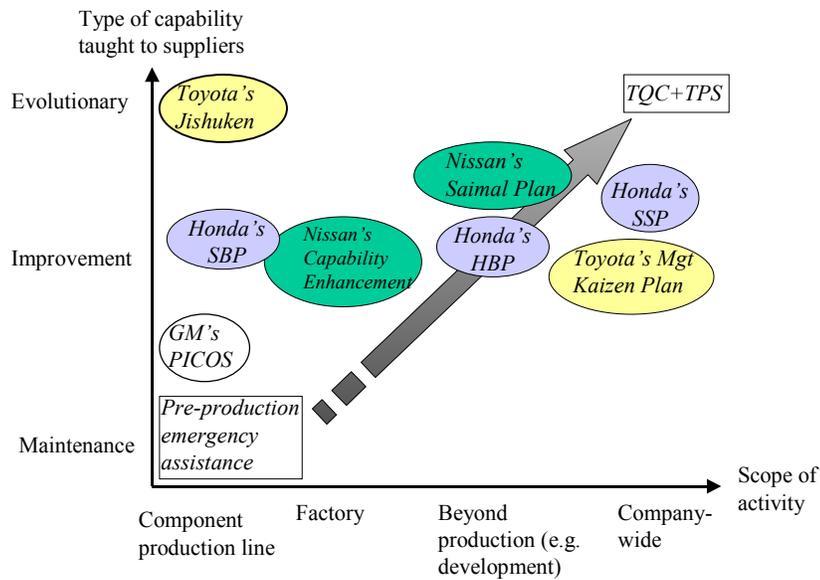
	<b>Toyota</b>	<b>Nissan</b>	<b>Honda</b>
<b>Number of key parts suppliers</b>	Approx. 350	Approx. 350	Approx. 300
<b>Supplier association</b>	Kyohokai	Takarakai Shohokai (merged in 1991)	None
<b>Member suppliers</b>	229	174	
<b>Recipients of core supplier development</b>	52 (Jishuken Groups)	25 (Capability Enhancement)	63 (Slim and Solid Production)
<b>Supplier development engineers</b>	50 in Operations Management Consulting Division	80 in Engineering Support Department	58 in Purchasing Technical Centre

Source: Sako (1996), and author interviews.

**Figure 1: Bifurcated Structure for Supplier Development at Toyota**



**Figure 2: Typology of Supplier Development Activity**



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## Endnotes

i In making a conceptual distinction between maintenance and improvement capabilities, we assume that the daily management of production requires a conscientious application of the standard work methods. However, as Nemoto points out, there are two meanings of standardization, one referring to absolute standards for safety or compatibility, such as British Standard or JIS, and the other to the process of improving any points which are found to be deficient by following the standard work methods (Nemoto 1985, p.63). In the latter meaning, standardization is not an end but the beginning of making improvements (see also Adler 1993, MacDuffie 1997). In this sense, maintenance capability is intricately linked to improvement capability.

One common 'routine' for 'improvement capability' (but not for maintenance capability) is policy deployment (Hoshin Kanri) in Total Quality Control, which involves the setting of objectives for improvement to be achieved within a specified period of time. The term, Hoshin Kanri, was coined in 1965 by the tire maker, Bridgestone, when it was preparing for the Deming Award in 1968. The company felt the need to coin a new term that focused on processes, because the known technique of MBO (management by objective) tended to become too results oriented (Kogure 1988, p.162).

ii This sub-section describes the situation at Nissan prior to Renault's equity participation in 1999, to benchmark subtle differences among the three companies within a broad Japanese pattern. Thereafter, Nissan's supplier relations became quite turbulent. Carlos Ghosn, as the COO of Nissan, made it his top priority in the Nissan Revival Plan to return Nissan to profitable growth and to reduce its net consolidated debt of 2.1 trillion yen in 1998. Sales of assets tied in securities, real estate and affiliates (including suppliers) helped reduce this debt to 8.6 billion yen in 2003, whilst the establishment of Renault Nissan Purchasing Organisation (RNPO) in 2001 to manage 40% or more of the combined global annual purchasing spending contributed to reducing Nissan's purchasing costs by 20% during 2000 and 2002. Thus, Nissan responded to a pressure to switch to a more market-based approach to supplier selection, within the context of sharing a global supplier base with Renault. In response, some smaller suppliers lost business within Nissan, and amongst those that continued to trade, some suppliers merged with each other (as in the case of Calsonic Kansei) or were sold (e.g. to Hitachi in the case of Unisia JECs). Nevertheless, activities to spread the Nissan Production Way (NPW) to suppliers continue.

iii Nissan has put much emphasis on educating both its own employees and suppliers about

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Genba Kanri. The internal education is the responsibility of the Personnel Department, while the responsibility for spreading it to suppliers resides with two experts in the Engineering Support Department. The Genba Kanri course for suppliers consists of the teaching of NTWI (Nissan's version of Training-within-Industry), and a five-day practice course involving a competition among 3 teams of 7 participants each over solutions to building a plastic car model. Each team contains participants from several different supplier companies, and is potentially a forum for suppliers to learn from each other.

iv Questionnaire surveys were sent to first-tier suppliers in North America, Japan and Europe in 1993 and 1994. Response rates were 55%, 30%, and 16%, with valid samples of 675, 472, and 262 in North America, Japan and Europe respectively. See Sako, Lamming and Helper (1995) for details.