From product to performance: creating business relationships

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ABSTRACT

This paper elaborates on why and how business relationships develop through an in-depth study of a world-leading industrial tooling company (ITC). The study of the ITC focuses on the development of a "preferred supplier" concept, developed in the UK subsidiary since the mid-1990's. The aim was to capture business volume at customers through greatly increased embeddedness from a legal, technical and social point of view. In brief, the ITC offers greater productivity at the customer plant through productivity analysis using its network knowledge of cutting, milling and drilling operations and the tools involved. This has been codified in a software package. The ICT also offers automated, real-time stock control and consignment stocks.
The case study highlights some important implications of business relationships. It shows that strong ties can be built relatively fast if a working methodology exists and if buyers are willing to give suppliers a greater role. The main driver for the relationship in general, commitment, investments and trust, is the explicit methodology and documentation of achievements in terms of productivity gains and cost savings. It is the network knowledge of the ITC that is exchanged, not the tools themselves but rather the optimization of the activities that they perform. For the ITC, what was previously a fragmented but stable market is becoming a winner-takes-all market, at the customer level. This indicates that increased levels of supplier-customer embeddedness can lead to fierce competition among suppliers.

INTRODUCTION

Strong inter-organizational ties can greatly enhance the efficiency of an activity by mobilizing resources and capabilities external to a single firm. This is evident in the proliferation of strategic alliances, outsourcing and single-sourcing agreements. While the rationale for strong inter-organizational relationships has been demonstrated theoretically and shown empirically, there is still a need to better understand the process of their creation and a need to discuss the concrete benefits and potential disadvantages of such relationships.

This paper elaborates on these issues through an in-depth study of a world-leading industrial tooling company (ITC). The study of the ITC focuses on the development of a "preferred supplier" product and marketing concept, where the ICT is the supplier. The concept has been developed in the UK subsidiary in the mid-1990's, in collaboration with local customers and foreign suppliers. The aim was to capture business volume at customers through greatly increased embeddedness from a legal, technical and social

point of view. In brief, the ITC offers greater productivity at the customer plant through productivity analysis using its network knowledge of cutting, milling and drilling operations and the tools involved. This has been codified in a software package that enables ICT application engineers to re-engineer customers' operations, and to document the cost saving and productivity gains of such re-engineering. In this process, the customers accept conversion to ICT tools where it is cost-effective, but do not pay anything for the re-engineering, which is really technical consultancy. The ICT also offers automated, real-time stock control and consignment stocks, again as a method to increase the productivity of the customer and decrease their costs. In this capacity, the ICT takes on the role of distributor for all tooling requirements, including competitors products.

The case study highlights some important implications of business relationships. While exchange has traditionally been products only, now exchange focuses on productivity per se. It is now the network knowledge of the ITC that is marketed and purchased, i.e. not the tools themselves, but rather the optimization of the activities that the tools perform. This means that what was once a relatively fragmented but stable market is now becoming a winner-takes-all market, at the customer level. Whereas dependence on any one supplier was considered anathema to cost cutting, the cost savings offered more than outweighs the discounting behavior of multiple suppliers. Such features indicate that increased levels of supplier-customer embeddedness can lead to fierce competition among suppliers. Furthermore, the implications concerning the effect of information technology developments and e-business indicate that these can enable stronger, rather than weaker ties.

The next section outlines a theoretical review of business relationships and networks. After that, the case study is presented. Finally, implications for practice and for theory are discussed.

BUSINESS RELATIONSHIPS

Economic organization concerns the combination, allocation and exchange of resources. In its simplest abstraction, economic organization occurs through markets or hierarchical arrangements, with their corollaries of price and authority (Coase, 1937). However, this dichotomy is quite unsatisfactory for theorists and practitioners of

business. Early challenges include Thompson (1967), Richardson (1972), and the so-called interaction approach (Håkansson, 1982). These and other perspectives argue that resources are heterogeneous and interdependent. The value of a resource depends on its combination with other resources and the activities surrounding it. Knowledge about resources is also heterogeneous and distributed. While prices constitute one kind of information concerning a resource or a product, more or less idiosyncratic knowledge about how to produce it and how to use it (Dahlqvist, 1998) usually interact for resource development to occur. Such interaction has been shown to take place in business relationships, which means that a common mode of economic organization includes dimensions both of market and hierarchy.

It is common for business-to-business exchange to be characterized by long-term, stable business relationships. While price is always an important dimension of exchange, even in these relationships, a more important feature is interaction that aims to increase the overall efficiency, through adaptation and the development of the resources and activities that the respective actors are involved in. Studies have shown conclusively that interorganizational relationships are arrangements through which the business process can be effectively managed and above normal rents created and sustained (Levinthal and Fichman, 1988; Zajac and Olsen, 1993; Anderson et al., 1994; Dyer and Singh, 1998). Exchange effectiveness is improved through adaptation between business actors (Hallén et al., 1991), investments in relationship-specific activities for higher efficiency (Dyer and Singh, 1998), establishment of cross-functional communication between business actors (Olson et al., 1995; Ragatz et al., 1997), and enhanced understanding of the production system in which exchanged products are to be used (Mattsson, 1978; Dahlqvist, 1998).

However, stability, in terms of business counterparts, does not indicate a lack of dynamism. Most business actors find themselves in a situation where continuous development in terms of product development, innovation, changing customer requirements, changing supplier offers and new markets etc. are occurring. Thus, the content of business relationships is often very dynamic in terms of development of the resources and activities involved. Business relationships are thus vehicles for interaction, enabling actors to develop products and production processes (Lundvall,

1985; von Hippel, 1988) and exchange information about business opportunities (Ottum and Moore, 1997).

However, even in business-to-business exchange, not all products or services are associated with deep interaction, strong ties and long-term stability. Sometimes, as in the case discussed in this paper, exchange is due to the consumable and relatively standardized nature of the goods and the presence of several competitors with similar offerings; i.e., the price of each exchanged product is relatively low (almost negligible), even in terms of total annual volume. The wide range of specifications allows suppliers to make frequent calls offering the latest versions and, more importantly, the latest discounts. Thus, business exchange is of an almost arms-length character, with price as a major decision-making factor.

However, the resulting situation is sub optimal for both customers and suppliers. By focusing only on the price dimension, customers have little control over their supply base and incur high indirect costs relating to inventory control, logistics and fragmented production processes. Similarly, suppliers are caught in a discounting race that erodes their margins and makes it difficult to recover development costs. Higher levels of interaction can then by used to create closer ties, higher stability and superior performance. The present case illustrates such a process, and also exposes the implications it gives rise to.

Specifically, the paper addresses areas that have not been exhaustively studied. The dominant line of research on relationships has focused on such motivational factors as trust and commitment (Anderson and Narus 1994; Morgan and Hunt 1994; Ring and Van de Ven 1992, 1994), and less on the underlying value created in business relationships. Furthermore, while we know much about why relationships exist, we know much less about how they emerge (Ring and Van de Ven, 1994). The objective of this paper is to further such understanding by an in-depth case study, with an explicit focus on the commercial implications of business relationships.

CASE STUDY

The international tooling company and the preferred supplier concept

The ICT is a leading, global supplier of carbide tools for the machining industry. It has a centuries-long history and has been producing cemented carbide tools since the

1930's. The current product range includes milling, turning, drilling and holding systems, with the bulk of sales coming from cemented carbide inserts. The applications are very broad, from fabrication of metal components (e.g. shafts and engine blocks), to form casting (e.g. for plastics). The company is present world-wide with more than 30 wholly-owned subsidiaries and more than 90% of the turnover is generated outside the home market.

The UK subsidiary is one of the bigger in the group, and has one of three "technical centers" outside the home market. The relative size is in terms of sales and customers, as the subsidiary does not carry out much production activity – production in the ITC is centralized to a few markets, with the bulk in the home market. Over the past seven years, the UK subsidiary has developed a "Preferred Supplier" (PS) marketing concept. The following section outlines the development of the concept, the constituent elements, how it is used and how it is experienced by customers. The section concludes with how the PS concept is being developed today, and how it is being spread in the group globally.

The case study underlying the following analysis was carried out through in-depth interviews with employees from the ICT in 5 countries, in subsidiaries and at headquarters. In total, 18 interviews were conducted with employees of the ICT, including the CEO, managers, development engineers, application engineers and salespersons. Furthermore, 3 customers were visited and representatives from them (construction engineers, purchasing managers and production managers) interviewed. During the case study, the ICT kindly let the author work at their premises and access archive material, meeting memos, presentations and agreement templates. Due to the novel and in some areas, sensitive nature of the case, the ITC has requested to remain anonymous. Also, much information was given in confidence and therefore direct quotes are not referenced to any particular individual.

PS concept: triggers and development

In the late 1990's, several concurrent developments occurred which prompted the development of the PS concept. In 1997, a large customer (car manufacturer) announced that it would be moving all of its tooling supplies to an integrator. For the ITC and other suppliers, the alternatives were to either supply the integrator or lose the business. This move, which came without consultation, prompted an analysis within the ITC. They

realized that they were not as strong in the marketplace as they had thought and that they could quickly loose significant volumes. They were also in danger of becoming distanced from their customers as integrators and wholesalers became middlemen.

At the same time, the ITC was looking closely at the behavior of such integrators and at one in particular. The integrator was not an explicit competitor, as it did not produce anything itself, but as it was close to the customer and shipped competitors' products, the ITC could not ignore it. The motivation for customers to use integrators was mainly to regain control of their tooling supplies in terms of inventory control, standardization and more efficient transactions (orders and invoicing). The ITC would have to offer similar services to stem the flow of business going through integrators.

Two key customers were also critical of the development of the PS concept. The first was a company that was on the brink of bankruptcy and urgently needed to reduce costs. The hectic pace of bringing down tooling costs made them a pilot site for the greater role of the ITC in their production process and tooling control. However, the problems were too great for this company and it closed down. As a pilot site, though, it contributed greatly to the development of the PS concept.

The second influential customer was a plant of a major US first-tier supplier to the automotive industry, with global sales exceeding 12 billion USD. The plant had just been acquired and new management put in place when a tooling standardization program was launched. At the time, the plant spent almost 1 million USD annually on tools. There was a great variety of standard tools and many suppliers, with consequent high costs of ordering and large, uncontrolled inventories. All major tool suppliers were invited to investigate a part of the plant for a month, and come up with a specific and a general proposal that would increase the control of tooling. The ITC had virtually no business in the plant at the time, but were invited since the customer had a good business relationship with them in the Benelux region. Coming up with the most holistic approach, the ITC got the assignment and subsequently won the customer's award for "Most innovative supplier in Europe".

Inside the UK subsidiary of the ITC, the rethinking had led to a decision that traditional marketing was not sustainable. Too much time was spent on customer calls, offering the latest product and competing by offering increasing discounts each year. The business

was volatile as sales efforts led to piecemeal volumes that could be priced away by competitors or integrators.

The solution, they thought, would be to offer more services to customers in return for a preferred supplier agreement. The basis of the service would be the ITC's superior competence in tooling and its impact on the production process. A team was appointed, which developed a software package named PCA (productivity cost analysis). This software would enable application engineers to improve the productivity of the customers, thereby taking on a greater role in the customers' production process than merely supplying the tools. It took the UK subsidiary of the ITC 2 years to fully develop the PS concept, with much of the development and fine-tuning taking place at customers sites, but without aid from other ITC units.

PS Elements

The PS concept is a marketing concept and the ICT only receives revenue from their products, not their services. The PS concept can be seen as having three main elements: a commercial element; a productivity analysis element; and, a stock element. The elements are in turn composed of a variety of tools and techniques. The ITC does not require that a customer incorporate all elements in order for a PS agreement to be established, but this is the norm.

The commercial element

The ICT is primarily a product-driven company and for any customer relationship, the product is the key to get the business. The commercial element relates to the product offering and discounts associated with the higher volumes that the PS concept entails. However, if much technical support is needed, discounts will be lower, with the argument that the customer does not pay anything for the support. As mentioned previously, the PS concept is intended to move competition away from day-to-day discounting all together.

The ICT provides tools for milling, turning and drilling, as well as tool holding systems. The industrial machining applications these tools are used in are very demanding in terms of precision and quality. The tool often comprises several components, basically a tool holder and inserts. The tool holder is connected to a CNC machine and onto it an insert is fastened. Since the only limiting factor of CNC operations is material

availability and cutter (inserts) wear, the tools are a small but critical input in the manufacturing process.

The inserts are made from carbide powder that has been pressed, sintered, sharpened and (commonly) coated. The inserts are the main business, since they wear out and need to be replaced (the world market consumes more than 500 million inserts annually). Inserts are manufactured primarily in the ITC home market, while some tool holders are produced locally and to customer specifications.

For the PS concept to be viable, the product range needs to be extensive. Converting to the ITC range, within the confines of the PS agreement, requires that the ITC can offer similar or better products with minimal or no investment cost for the customer, at least in the first phase. The ITC has been carrying out an expansion strategy of green-field investments and acquisitions to complete its overall product range, most recently in drilling and tool holding systems. While this strategy is unrelated to the development of the PS concept, it has probably helped the latter.

Without a competitive product, the PS concept could not work in its present form. The UK subsidiary is thus highly dependent on the home-market ITC units, with more than 90% of purchasing volume originating from sister units. It is also highly dependent on the home-market ITC for R&D and product development, although the subsidiary has a technical center and can carry out application testing locally.

In terms of logistics, most of the product flow goes from the producing unit (in the home-market or a sister subsidiary) to he European distribution center in Belgium, and straight to the customer. As the value-to-weight ratio is high for inserts, transport can be swift and the ITC offers 24-hour delivery to most of its customers.

The productivity analysis element

At the core of the PS is the productivity analysis element. This element is basically the PCA software and its application at the customers' plants. The software has been developed in-house at the UK subsidiary and is a simple program that incorporates a variety of factors influencing the productivity, tooling life and overall costs of a specific operation. The software does not constitute any new or complex knowledge, but can handle a large variety of factors and greatly enhances the speed with which calculations can be made. Engineers can and have done similar estimations with "pens and spreadsheets", but many time-consuming activities are automated with the software.

The PCA is applied software; i.e. it must be calibrated to specific operations. As such, PCA starts with benchmark measurements of a specific operation making a specific component. It is akin to 'scientific management' (stop-watch measurements), but of the machine rather than the operator. Taking into account materials, feed rates, tool changes etc., the PCA software indicates how a change in tooling affects the bottom-line productivity in terms of speed and component costs. When it comes to speed and efficiency, this is quite straight-forward, but cost analysis rests on some assumptions that need to be agreed upon with the customer. While this is seldom a problematic area, ICT application engineers often find that their customers' knowledge about the real costs of an operation is low.

The productivity analysis establishes benchmarks for existing operations ("Phase 1") and then goes into "Phase 2", where productivity is enhanced by altering operation parameters and substituting existing tools for the ITC product range. This is an essential part of the PS concept: by applying their knowledge and software, the ITC can enhance their customers' productivity and, in the process, build business volume, substituting competitors' tools for their own. There is also a "Phase 3", which is a more comprehensive redesign of an operation to further improve productivity. This last step is dependent on the ability and willingness of the customer to invest in an operation.

The PCA also ensures that the whole process is documented, a key issue for both customers and the ITC. Since the PS concept entails an implicit understanding of cost-savings for the customers, it is crucial for the ITC to be able to show the bottom-line effects of their activities.

This is the most time-consuming part of the PS concept, and the reason that its application has sometimes met resistance in the ITC itself. An application engineer can spend a lot of time at one or a few customers, which limits the time available for building new relationships or courting potential customers. Champions of the PS concept, however, argue that this is a start-up cost and is more than compensated for by the subsequent increase in business volume.

The stock element

Tools come in a large variety of dimensions and qualities, and need to be replaced frequently. To control tooling, in terms of logistics and inventory, is a big challenge, especially if many suppliers are involved. The stock element of the PS concept entails

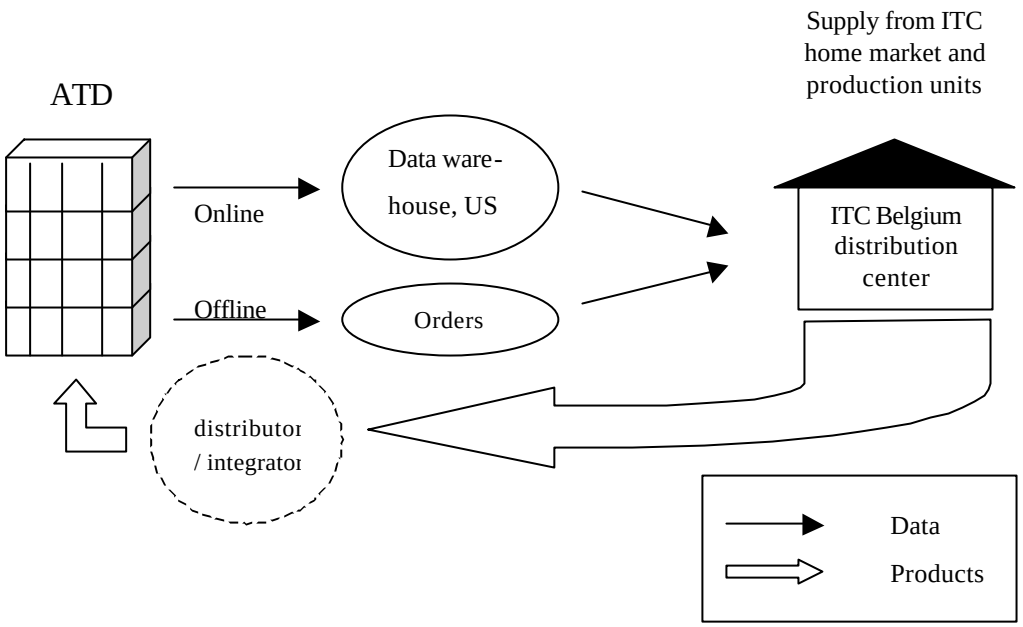
the offer of consignment stock and/or automatic tool dispensers to the customer. For some customers, the stock element is the main reason for entering into the PS agreement.

Consignment stock means that ITC products are stored at the customer plant, but while the tools remain in stock, the ITC retains title to it. Only when an operator takes a tool from the stock is the customer charged for it. Consignment stock has two main benefits for the customer: capital is not tied up in tools not in use and control of tool usage is enhanced. However, for the ITC, this means more capital tied up in stock, which has prompted them to search for stock-control solutions. This is done by traditional instruments, but increasingly a new technology can meet this objective.

Automatic tool dispensers (ATDs) are manufactured by a US company and have become very important to the ITC. ATDs look like vending machines and their functionality is much the same. A machine operator has a smart card that he or she swipes in the machine and punches the code for a particular tool, which is then dispensed. This action is logged so that the inventory is always precise. The ATDs come in two versions, an online model or one connected to a PC or local network. In the online case, the data is transmitted at regular intervals to servers in the US, belonging to the ATD manufacturer. This data is then processed in accordance with prearranged parameters and is forwarded to the ITC central warehouse in Belgium, which, in turn, ships the required products via DHL straight to the customer (or in some cases to a distributor who handles the restocking). The ATD manufacturer charges a subscription fee for this service, depending on the transaction volume. If the ATD is offline, it generates reports at regular intervals that are then manually transmitted to the Belgium warehouse (Figure 1). For bulkier tools, a locker system with a barcode scanner can be integrated into the system and placed adjacent to the ATD.

ATDs thus have several advantages. The amount of stock is minimized and stops in the production process due to tooling shortages are eliminated. The ATDs are small and can be placed next to machining cells, reducing the time it takes for an operator to access the tools. Furthermore, customers note a change in the behavior of operators: "*They realize that tools have a value. When they know that we know who is using a tool, suddenly they realize that it's not for free. There's no 'squirreling', we don't pay for the tools until we use them*".

Figure 1. ATD stock, data/product flow



From the ITC point of view, stock control in general and ATDs in particular, give them indications of high-volume tools that should be prioritized for conversion to their product range, thus quickly building up sales volume.

Stock control also gives early indications of anomalies in the production process. Since the tooling use is logged in real time, an increase in the use of a particular tool indicates that something may be wrong. By comparing tool use with production activities, the fault can quickly be identified. In one case, for example, the consumption of an insert rose rapidly. When the production manager looked into it, he found that the purchasing department had switched steel suppliers due to a lower offering from a Russian supplier. The cost saved on the raw material, however, was more than offset by the increased tool consumption: "*I took it to the purchasers, and showed them the bottom line. The [ATDs] gives us a much more holistic view of production.*" As one PCA team member expressed it: "*The ATDs closes the loop. It gives us control. Real control*".

The ITC of course prefers the customer to buy ATDs, but this is not compulsory and consignment stock without them is still an option. With ATDs, the ITC minimizes its capital tied up in stock at customers, but even so, the ITC has seen an increase in the amount of stock that it, rather than the customer, owns. Further use of ATDs is a method to reduce this.

In fact, ATDs may become a business in their own right. The ITC is negotiating with the American manufacturer for the ITC to gain an exclusive license for European sales. The ATD manufacturer has been very successful with similar machines dispensing pharmaceuticals and envisages a similar expansion into the tooling industry. As such, it is conceivable that the ATD can become a stand-alone offering, but in the UK, it is mainly used in conjunction with the PS concept. Some units have been shipped to other ITC subsidiaries that do not use the PS concept. This is likely to increase as ATDs become accepted by the ITC HQ.

Summary

Each element on its own is a vehicle for building a business relationship, but their interactive nature means that the offering is significantly strengthened if combined. However, customer needs differ; an aerospace supplier making thousands of more or less customized components does not require PCA, since this builds around volume manufacturing, but may still be interested in standardization of tooling and consignment stock. The current development of the PS concept focuses on catering for varying needs.

PS Agreement and implementation

The PS agreement is not a detailed contract, but rather an indication of intent. The agreement stipulates that the ITC will device a methodology (the PCA) and initiate like for like conversion to ITC tools, and that the customer will undertake to use ITC products where they can supply an equal or better cost effective product/machining solution. The decision parameter is thus holistic; it does not focus on the price of the individual tool, but rather on the cost effectiveness of the operation that can be deduced from how the tool is used. Where the ITC can show higher or equal productivity using their product, the customer will switch to it.

The agreement further stipulates that the ITC is available to solve machining problems of a tooling nature, on-site if necessary, and, that their technical center is available for testing parts and machining methods. Training of customer employees can also be provided by the ITC. A discount structure is attached to the agreement, but it does not explicitly state the overall cost savings in tooling. However, there is always a verbal agreement on a certain level of cost savings, depending on the state of the customer's plant. The agreement runs for two years, with a termination period of 90 days after consultation.

The actual work is then carried out on-site. An account manager and application engineers from the ITC, work together with a tooling champion, a manufacturing process engineer, a purchasing and logistics manager and machine operators of the customer. Initially, as the ITC team moves from cell to cell, the workload at the customer is heavy. The ITC team often has its own office in the plant adjacent to the shop floor. In fact, most of the ITC's application engineers/salespeople work full-time at customer sites and do not themselves have an office at ITC buildings. The boundaries between the companies are thus blurred; ITC personnel are a common sight on the customer's shop floor, passing in and out of the building as any other employee.

PS Customers

In this study, three customers with which the ITC had a PS agreement were visited and production and purchasing managers were interviewed. The objective was to get the counterpart view of the business relationship, and also to see how the PS works in practice. All three customers are in the engineering sector, although they vary greatly in terms of size, products and customers. Customer 1 is the company mentioned above as the pilot site for developing the PS concept (a subsidiary of a US first-tier supplier in the automotive industry). The plant in question (which has the PS agreement with the ITC) manufactures mainly rear axles and differentials. Customer 2 is a British company with long traditions, producing telescopic cylinder tipping hoists. Customer 3 is a company that has switched (foreign) ownership twice in the last decade, and manufactures brake systems for trains. Table 1 summarizes the motivations of the customers for entering into the PS agreement, the PS elements present, where the key emphasis of the relationship lies and the expressed "success factors" for the implementation and sustenance of the relationship.

Table 1. Summary of customer relationships

	Customer 1	Customer 2	Customer 3
Motivation / Trigger	New owners – "tooling standardization program"	Cost pressure and downsizing; new management	Reorganization; new owners and management
Elements present	PCA, ATD	PCA	PCA, ATD
Key emphasis &	Productivity increase,	Documented productivity	Stock control, trust

success factors	documented cost savings, stock control, trust	increase, cost savings, trust	

Motivation / trigger

The ITC did not have a close business relationship with either of the customers prior to the PS agreement, except for being one of many suppliers of carbide tools at arm's length. Common to all customers were that they were looking for a better solution regarding tooling supplies, which was most pronounced with Customer 1.

As described previously, Customer 1 approached all its suppliers and offered them an opportunity to propose an action plan for tool standardization in return for a partnership. The ITC won this "bidding war" by expressly avoiding a price focus. In the case of Customer 2, severe cost pressure and downsizing (from 1200 to 240 employees in a couple of decades), and a new, younger management, made them open to a novel approach. Besides the ITC, their largest supplier at the time was asked to provide a comprehensive tooling strategy, but failed to do so and thus lost the business. In the last case, a tooling wholesaler/distributor suggested to the new purchasing manager (appointed after a major restructuring and change of ownership) that the ITC was working with the PS concept. Customer 3 then approached the ITC for more information and also approached their biggest suppliers at the time to come up with counter-offers. As in the other cases, the holistic focus won the business for the ITC.

At the ITC, the view was that customers with new management on the lookout for new solutions were more receptive to the PS concept. *"We're selling a vision, and this vision must match theirs*". Furthermore, the shortage of production engineers at the customers, due to downsizing and to a general labor market shortage, meant that the competence required to undertake control, standardization and productivity-enhancing measures was lacking. At none of the customers was there a clear-cut case of outsourcing; the activity had not been present in a systematic way in-house previous to the PS agreement.

Key emphasis and success factors

The key emphasis refers to an analysis of what the customer representatives tended to stress as well as what the application engineers saw as prioritized in each case. These factors are related: e.g., stock control results in cost savings, which results in increased productivity (if this is measured as output/cost). However, the different emphasis

indicates the slightly differing rationales for each customer, with implications for relationship development and sustainability. Emphasis on productivity increase places more stress on time-consuming PCA to enhance output and free-up machines. Cost savings stress conversion to standard tools. Emphasis on stock control entails conversion and setting up an efficient flow with the help of ATDs, with initially high but decreasing time-demands.

At Customer 1, application engineers had prioritized projects, but were on a daily basis interrupted by problem areas. Due to the high costs associated with any stop in the production process, ITC employees were present or on-call around the clock. At Customer 2, they moved from one machine cell to the next, optimizing the current operation using the PCA. At Customer 3, installing ATDs and conversion to standard tools was prioritized.

The different priorities entailed different demands in terms of application engineers' time - time that could be spent developing other customer relationships. One engineer was so occupied with a customer – and had been for more than a year – that virtually no other contacts had been established. As the ITC does not charge for this time, it can be seen as a loss – at least, some engineers felt that ITC compensation schemes treated it as such. On the other hand, the close contact not only builds business, but increases the dependence of the customer on ITC's competence. Although all customers visited were content with the relationship and did not consider abandoning the PS agreement, the less the involvement of ITC application engineers, the lower the feeling of commitment. It is conceivable that after systems are in place, optimization and conversion to standard tools has been made, a customer could switch back to a price focus.

The close contact and frequent interaction between application engineers and machine operators was also very important for the perceived success of the implementation. The customers stressed that building high levels of trust early had been crucial to the development of the relationship. At the managerial level, the ITC was appreciated for a "*realistic*" approach, and "*concern for our production process*" – i.e. the expressed deviation from a price focus emphasizing instead specific analysis (and time). Customers felt that they were a priority and that the ITC tried to understand their specific operations and circumstances, rather than forcing their products on them.

Resistance from the operators could be detrimental as benchmarks would be inaccurate and conversion would be slowed down. At the operator level, ITC application engineers were appreciated by all customers since they were out on the shop floor, rather than in the office. The engineers also emphasized continually that the measurements they were taking were not of the operators, but of their machines. They also encouraged input and suggestions from the operators: *"It's their machines. I try to explain to them that if they help me, then I can improve their machine. I can help them do more, not by working harder but by working more efficiently."*

However, frequent interaction alone could not develop trust. Trust was predicated on the commitment to optimize operations and convert tooling, using a measurable and documented method. The PCA was crucial not only as a tool for the ITC application engineers, but also as a reference point. The explicit and easily understandable nature of information in the PCA established shared views on the cost savings that had come about with the PS agreement. The PCA helped operators to understand their machines better and to see the effects of changed behavior that would otherwise have been difficult to discover. At the managerial level, the documentation produced by the PCA was highly valued – bottom-line cost efficiency at the component level became explicit in an unprecedented way, in turn facilitating planning and budgeting.

Finally, stock control was a success factor, particularly for Customer 3. The effects in terms of the reduced cost of capital, a more efficient transaction process and speedier logistics were critical for them. This indicates that a PS agreement without the PCA component is a viable offering for some customers.

Summary

Customers seemed content with the PS agreement and they all foresaw a continuation. A holistic approach, documented cost savings, tooling control and close interaction building trust, appeared to be the main factors for quickly building strong business relationships. For the ITC, the implementation of the PS agreements has translated into better performance through increased volumes: sales increased 83% in 2001 in the PS accounts, in a recessive market.

IMPLICATIONS AND FURTHER RESEARCH

Business relationships and networks emerge and evolve over time in a process that restricts and enables companies to achieve their objectives. While much research has focused on the incremental and rather slow processes of relationship development, this case exposes a more conscious and rapid process. While trust has been a crucial factor for the relationship to work, primary factors have been formal commitment, investments and documented achievements – trust builds on the underlying value achievements of the relationship.

Since business volume was very low or non-existent in the surveyed relationships, the case shows how a company can move purposefully and change structures. This move was dependent primarily on an extended scope of exchange and active relationship building. The ITC offered not only the product, but also their knowledge on how to apply the product. Business exchange moved from a 'simple' product/price dimension to a more holistic approach including tool handling and application knowledge. The knowledge about how to apply the product and to offer it in such a way so as to build strong relationships quickly, was in this case dependent on two conditions.

First, the ITC has been able to mobilize its network knowledge and linkages to specific relationships. Knowledge about how products are applied is build-up by experience of numerous applications across industries and markets. Application engineers witness a multitude of solutions at customers and in test centers, and their application knowledge commonly surpasses that of customer production managers and operators. This can be related to theories of learning and knowledge that stress the importance of communities-of-practice and multiple identities (Lave and Wenger, 1991; Brown and Duguid, 1991). Furthermore, the linkage to the ATD manufacturer, distributors and logistic firms enabled the ITC to offer the PS concept. The capabilities of the ITC can thus be said to include its network linkages (Chen and Chen, 1998).

An important implication of this observation is that large demands are placed on the internal organization in terms of competence levels and development. The more relationships a company has, in varying contexts, the greater the service that can be offered to the customer, *if* there are working knowledge sharing routines in the company. Knowledge transfer thus becomes a critical issue, especially as application engineers spend most of their time at customers. The focus on application knowledge

also places new demands on employees' competence and incentive schemes. In general, competence levels must be higher than before, as the salesperson must not only have knowledge of the product being sold, but also of how the specific customer uses it. Also, more functions need to be active at the "boundaries" interacting with counterpart companies. Incentive and compensation schemes must reflect the high initial costs (in time and personnel) of relationship building, which then generates stable revenues; i.e. a long-term view of compensation

The second condition for building business relationships relatively fast is the codification of application knowledge. Such codification is evident in the PCA software and in the ATD hardware. These not only enable a faster and more efficient conversion process, but also provide control and documentation. Such control and documentation has been critical to achieve comparable measures, a common understanding and thereby to build trust, especially at the managerial level. It is interesting to note that codifications are IT-based tools, implying that there is a need to be careful about generalizations concerning IT.

The case also shows one example about how business relationships emerge. Here, both buyers and the supplier were active in seeking a more comprehensive tooling strategy. It is illustrative that in all customers surveyed, management had recently been changed. In competition with other tooling suppliers, the ITC were given the business and the license to replace competitors' products with their own. In this case, strong business relationships emerged quite rapidly using a conscious methodology. .

This has some implications for competition. In cases where the competitive arena moves from product to performance (and thereby tighter business relationships), competition can become fiercer. Even though day-to-day price competition between suppliers is reduced at a particular customer, as competitor products are phased out and replaced, the competition for the relationship itself becomes more important. In these cases, the existence of strong business relationships is not evidence of a lack of competition.

Of course, there are limits to what one case study alone implies for theory. However, this case, like many others, show that in order to understand a company's capabilities, the opportunities and obstacles it faces, we must look at the direct and indirect relationships in which it is embedded. In production, cost efficiency in the production

process is a crucial capability. As we have seen, such cost efficiency may be dependent on the interaction and cooperation between many companies – and that is only in one dimension, tooling. A network perspective, taking into account the specific direct and indirect activity and resource ties between actors is fundamental for understanding business.

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