Turning Product Business into Service Business: Performance Contracting as a Challenge of SME Customer/Supplier Networks

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Abstract

Especially in industrial markets very often the business is traditionally focused upon a tangible core, such as a machine or a plant, whereas services are more or less treated as add-on features in hardware-dominated offerings. As tangible offerings are becoming more and more exchangeable in competition, the suppliers put more emphasis on the services in their marketing management. Nevertheless, the activities often lack a sense of strategic direction. Among other shortcomings the necessity to understand the business no longer as a product business but in the way of a service business, integrating the customer into the process of providing an individual solution with lots of customized features in the whole product bundle, is neglected too far.

The concept of performance contracting strictly refers to this point. Such a contracting as a transaction design implies that customers and suppliers establish a contract-based relationship as a frame for several transactions following up. The customer does not buy a complex equipment. Instead, the supplier respectively the supplying network provide the infrastructure for the customer for a long time and the customer only has to pay for performance. Turning fixed into variable costs, the availability of a certain capacity, the opportunity permanent revamping according to the technological state of the art, and the closeness to the customer are substantial reasons why customers prefer contracting solutions in mechanical and plant engineering. Based on a case study dealing with a customer/supplier network, consisting predominantly of small & medium-sized entreprises, the pro's and con's of performance contracting as a means of turning product into service business will be introduced in this paper.

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The emergence of contracting solutions are analyzed in terms of economic theory. Corresponding to the very nature of these arrangements, in particular the transaction cost approach, the resource dependence approach, the resource-based view, and the theories of the functions of the executive represent a promising background in order to analyze performance contracting in theoretical terms. As all the four theories offer specific insights they are compared in order to understand their particular view on the emergence and the problems of performance contracting. The results of the theoretical analysis are confronted with the first results of contracting arrangements in business practice.

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Introduction

A primary goal of modern marketing management is to achieve a higher level of customer orientation and customer satisfaction than the competitors. In the face of the high intensity of international competition in industrial markets, it belongs to the most difficult tasks of the managers of small and medium sized entreprises (SME's) to work out sophisticated ways of customer orientation permanently. One approach among others is about "performance contracting" which implies that the customer does not need to purchase complex equipment any longer and to make use of it by a cost-intensive operation crew. Instead, the supplier or the supplying network makes the equipment (i.e. machine, plant) available to the customer and provides different services all around the equipment. The customer only has to pay for the performance he gets. Understanding the business in such a way implies that the supplier changes the way of the transaction from a product-oriented one to typical service business going along with a high degree of customer orientation.

The approach of performance contracting is neither new to marketing management in general nor to industrial marketing in particular. In some industries contracting issues have been addressed in the 80's as well as in the 90's (cf. Barrett et al. 1992; Goddard/Mannion 1998; Kettner/Martin 1999; Vining/Globerman 1999). Notwithstanding another contracting debate makes sense not only due to the fact that the mechanical engineering industry is to be addressed the first time. Moreover, the particular setting of building and maintaining SME networks needs to be analyzed and the topics of service engineering will be stressed. Service management and service engineering are becoming essentials of performance contracting because otherwise it will not be possible to keep up with the ever-changing customer requirements. Therefore the under-researched but with regard the firm's competitiveness very important topic of service engineering and service innovation will be one of the key building blocks of performance contracting.

It is up to the interdisciplinary research project called "Invest-S"

(1) to highlight the specific background conditions of mechanical engineering,
(2) to examine whether and how far such ways of understanding the business and of providing the services together with other partners are appropriate in order to respond to actual and future challenges of competition,
(3) to discuss the possibilities and limits of reconsidering the make or buy decision.

More generally, the intention of this article is to understand potential payoffs and pitfalls performance contracting arrangements in theoretical terms (transaction cost approach, resource dependence approach, resource-based view, and Schumpeter's theory of entrepreneurship) and to compare the results with the first empirical findings of the research project. The different views could be useful to contribute to a deeper understanding of contracting. In order to avoid terminological confusion, it is necessary to state what this mode of coordination is about: *Performance contracting means that a supplier or a co-operation of suppliers renders a customized bundle of technical infrastructure with several add-on services within a frame-giving and long-lasting contract basing upon the idea that the customer acts a user of the infrastructure, only paying for the performance delivered.* It appears to be true that performance contracting belongs to the typical service transactions and represents an extreme way of performing the service business in terms of the variety of the product elements the bundle consists of.

Problems of the Product-dominated Business in Mechanical Engineering

In many fields of mechanical and plant engineering, manufacturers understood their business just as pure product suppliers for a long time. Recently, industrial services play a more and more important role. They are to be defined as services being provided by suppliers and delivered to organizational buyers before and during the purchasing process as well as during the phase of product use. Beside almost obligate services like consulting, planning, supervising and maintenance efforts they meanwhile include financial engineering, machine/plant optimizing, revamping and recycling up to the complete operation of single machines/plants or even combined processes. Opposite to their impact on competition, industrial services were rendered but did not play a major role in the respective marketing approaches of the suppliers. In traditional business transaction in mechanical engineering, services have been provided by different parties:

- Machinery and plant engineering companies limited their services offerings to a minor degree, often just enough to sell their products and to arrange a loose coupling of the customers. Most services were provided unconsciously, free of charge and first of all without a clear concept of strategic service marketing.
- Services performed by customers themselves first of all enclosed the operation of the aggregates and low-level maintenance.
- Further services – like finance, difficult maintenance and dismantling – often were conducted by special providers of services.

This way of conducting business goes along with some problems. For the buyer of machines and/or plants there are enormous co-ordination expenses for combining the rendered services. The search process and the valuation of the supplier's side are complicated by service specific

characteristics such as intangibility and customer integration/participation (Freiling/Paul 1996; Marion 1996).

The technical handling of the overall process becomes more and more difficult because of the higher complexity that results from an increasing degree of machine- and plant integration. As a result of this process, many of the services rendered by the customer up to now can no longer be conducted without external support. Therefore the purchaser is frequently not able to manage business in a purposeful way.

Furthermore the rising competitive cost pressure in international markets causes some outsourcing activities of the customers in respective industries. First of all, the services not belonging to the core business of the enterprises are concerned by these developments.

On the supplier side the possibilities to gain advantages of differentiation to stand out against competitors by technical innovations or high quality of the core product are very limited. In such a surrounding the creation of improved services by originally hardware-oriented machine and plant manufacturers seems to be a suitable opportunity to lower the resulting cost pressure by the exhaustion of differentiation potentials. Especially in segmented markets manufacturers should intend to provide specific market segments with requested service packages. They also should be able to react dynamically to occurring changes in markets. Therefore, in innovation activities it is necessary to put more emphasis on services than on hardware. But especially service engineering must still be seen as an important gap in actual research.

Invest-S: Service-oriented Networks as a Response to Weaknesses of the Product Business

Because of lacking in empirical evidence in this area the research project “Invest-S” is intended to examine whether it is possible to solve the above mentioned problems and to arrange competitive advantages for suppliers by networks consisting of machinery and/or plant engineers, special service providing companies and customers. There is a wide range of services that can be rendered by these networks and there is a variety of transaction designs that have to be taken into consideration. Therefore, first of all, it is necessary to structure this new way of conducting business. Especially for small and midsize enterprises, it is important to position themselves according to their actual supply of services and to extend their range of services step-by-step.

A step-by step-approach that enables suppliers to position themselves according to their actual services and to expand their range of services step by step is the result of a feasibility study of

the network partners. The ideal shape of the step-by-step-approach comprises the following steps (services mentioned on each step should be seen as an addition to services on the previous level):

- pure production of tangible goods with just obligatory services included,
- maintenance, modernisation and preventive services,
- operative training plus software development and internet/e-commerce offers,
- finance and financial engineering,
- complete operation of the machine or plant by the supplier network.

Because of the diversity of the services, which have to be provided, it seems very unlikely that one single supplier is able to perform the whole range of services on his own. This assumption is supported by the multitude of outsourcing activities of the customers in the last decade.

In such a surrounding network, consisting of several suppliers from different industries to combine their resources and services seems to be a solution for providing suitable service packages to the respective market segments and to develop them to gain long-term competitive advantage. Performance contracting which is examined inside the project Invest-S is a very extensive way of the co-operative rendering of services. The project partners signalled an increasing interest in contracting solutions reaching from the “simple” extension of their range of services up to the offering of complete operation of whole processes including all necessary services. The success of diverse contracting solutions in some other industries - for example in huge plant engineering, especially power plants, and in the US health and education sector (Barrett et al. 1992; Goddard/Mannion 1998; Kettner/Martin 1999; Vining/Globerman 1999) – supports this interest in checking the possibilities of performance contracting in the examined sectors of tool machine manufacturing and machine/plant manufacturing for the beverage industry.

But what exactly is performance contracting looking like? One concrete definition of performance contracting appears to be quite difficult because of the wide range of contracting solutions in different branches. Nevertheless as a working definition for this paper we define performance contracting as characterised by the following aspects:

- The **range of services included** in performance contracts includes at least the extent of full-service contracts (full service contracts are defined as contracts including all usual maintenance efforts, delivery of spare parts and further more services for generating an operation of the machines/plants without any breakdowns - nevertheless further services especially after sales can be included as well).
- The **way of service production** is characterised by customer integration. The services are not rendered autonomously by the supplier but in close co-operation and with deep integration and participation of the respective customer.

- The **way of payment** of contracting solutions is **paying** only **for performance**.
- Performance contracting is **based on contractual frameworks** but in this context contracts should rather be seen as a complement to trust than as an opposition (see Goddard/Mannion 1998) .
- Relationships of contracting partners are **long-term co-operations** due to the substantial mutual adaptations.

Performance Contracting - An Economic Perspective

In order to understand correctly what performance contracting in mechanical engineering settings is about, it appears to be useful to make use of insights of *economic* theory. This is due to the fact that mainly problems of coordination are to be analyzed. Apparently, the approaches of economic theory are usually in a position to address such problems in a sophisticated way. These insights of a theoretical analysis could prepare the ground for on-going empirical research. As the characterization of performance contracting indicates, there are some major aspects to be discussed: First, contracting solutions can only be established if an adequate way of coordination will be arranged and if it is possible to reduce the sometimes substantial amount of uncertainty. A transaction cost analysis of performance contracting responds to this kind of problem. Second, performance contracting implies pooling resources of different firms in order to compensate resource gaps. One supplier standing alone will not be in a position to get all the problems of contracting fixed. The dependence of external organizations can frequently be addressed by the resource dependence approach. Third, it is not enough to create a resource network consisting of assets of different firms. It is necessary to trigger off synergies among the respective firms. The emergence of network competence, the processes of organizational learning and even the adaptation and transition processes from one state to another are subject to a resource- and competence-based view on performance contracting. Fourth, performance contracting can only be a promising alternative to other ways of providing services in a customer-oriented way if a more or less continuous renewal takes place. New services have to be developed. However, service innovations can only make sense if it is possible to integrate them into a promising strategic marketing approach taking future developments into account. Keeping the background of economic theory in mind, especially the theories of entrepreneurship are able to highlight these important facets of performance contracting. It is argued that among these theories of entrepreneurship especially the Schumpeter approach is useful in order to develop a compromise between inside out- and outside in-oriented topics of marketing management. The following sections will take these aspects into account. To avoid confusion, it is to be pointed out explicitly that every theoretical approach sheds some light on the problems of performance contracting. However, there is no integrative approach covering all the relevant aspects of the topic in a single framework. Moreover, it is neither useful nor possible to connect all the theoretical insights within a "metatheory" because of lacking compatibility of the cited approaches. As a

consequence, there is a certain competition among the theories in order to explain the most relevant facets of performance contracting.

A Transaction Cost Perspective on Performance Contracting

The transaction cost approach (Coase 1937; Williamson 1985) addresses the economic coordination of activities in the face of uncertainty, asymmetrically dispersed information in the market process, and the possibility of opportunistic behavior of exchange partners. In order to respond to these challenges of the market process, economic actors – behaving bounded rationally (Simon 1976) – try to develop transaction designs. Those transaction designs are useful in order to control the transaction efficiently. A well-fitting transaction design provides safeguards against the numerous threats of the market process. Those safeguards can be based upon i.e. contractual agreements and trust. However, this protection is a costly matter, as the set up of such designs causes transaction costs of the different kind (Williamson 1985; North 1990). Therefore, finding out appropriate transaction designs matching the situation of the business environment is one topic which needs to be analyzed before the discussion of performance contracting can take place.

Among the different surrounding conditions of the business environment in the respective market segments of the mechanical engineering industry, the following aspects relevant to transaction cost theory need to be stressed:

- The pace of technological innovation is still high. However, this technological dynamism does not go along with chances of the supplier to create long-lasting competitive advantages. Sometimes the market settings are close to the notion of "hypercompetition", as put forward by D'Aveni (1994): In the face of a high intensity of competition, competitive advantages are often quickly eroded over time. This implies that there is a substantial threat for non-movers to be outpaced in competition. All in all, a high degree of technological uncertainty can be observed which causes problems of making the right decision with regard to customers as well as concerning suppliers.
- Due to the complex tasks of coordination, the customer/supplier relationships are usually quite close. Consequently, there is a substantial degree of dependence respectively interdependence implying behavioral risks.
- The network of firms representing the supply side as well as the customer need to make investments which are usually partner-specific. Such specific investments are necessary in order to make sure that a customized solution will be provided. The specific investments itself generate quasi-rents (Klein/Crawford/Alchian 1978). This opens up the door for opportunistic behavior of the other party. However, opportunistic behavior is less probable if *both* parties need to make specific investment. A state is possible where the specific

investments of the supplier are equal to those of the supplier. Trying to appropriate the other party's quasi-rent does not make much sense in this constellation.

Keeping this context in mind, the topic of relevant criteria to establish a well-fitting transaction design needs to be addressed. As Williamson (1985) points out, there are three important criteria of transactions, with significant impact on the level of transaction costs: (asset) specificity, uncertainty, and frequency. According to the particular importance of the three dimensions, a transaction design on the "scale" between market and hierarchy (Williamson 1985) has to be chosen. Especially Richardson (1972) points out the relevance of "coordination by cooperation" as an intermediate type between the two extremes.

Analyzing the demand conditions when specialized machine parks are to be bought, a transaction design quite close to hierarchical coordination seems to be appropriate at first glance. However, a closer analysis is necessary. The traditional way of buying is organized as follows:

- The first part of the transaction is about *delivering a special machine*. Consequently, there is a higher degree of interaction between customer and supplier due to the bargaining process. A contract is usually an important means of coordination. Moreover, the interaction process continues as the delivery of the machine and some particular services needs to be arranged. In sum, there is a moderate degree of uncertainty and even specificity. However, the situation is far away from idiosyncrasy.
- The often neglected second part is about the *usage process* of the machine. As the customer buys the equipment and employs a specific operation and maintenance crew, this part is about vertical integration in terms of transaction cost theory. It offers an almost maximum degree of control and a safeguard against opportunistic behavior of potential exchange partners.

In the face of recent developments in the mechanical engineering industry, especially in case of customers demanding full service offerings (Stremersch/Wuyts/Frambach 2001), the question arises if the traditional way of coordination is still appropriate and why performance contracting could be useful.

(1) With regard to the criteria of the transaction cost approach, those transactions in the mechanical engineering industry go along with a level of specificity higher than the transaction of selling a machine with some additional services and lower than in case of hierarchical coordination. The transaction requires partner-specific investments of both the customer and the supplier because otherwise the required adaptations (Hakansson/Gadde 1997) between the two parties cannot take place.

(2) Concerning technological dynamism, the customer faces the risk of rapid maturing of the machine if there is no continuous contact to the supplier. Performance contracting shifts the responsibility of technological adaptations in case of technological improvements, especially breakthroughs, to the supplier. Every once in a while the supplier will start a revamping procedure increasing technical abilities instead of erosion processes taking place slowly. Technological risks will be reduced this way.
(3) Performance contracting implies that the supplier provides a tailored solution with customized hardware and service offerings. The full service concept which is typical in case of performance contracting can only be implemented if parts of the supplier crew act more or less exclusively for the particular customer. As this (at least) partial exclusiveness is a long-lasting state due to the respective contracts, this clearly indicates the high degree of specificity. The quasi-permanent availability of the supplier's assets reduces some important uncertainty of the customer. On the other hand, it clearly indicates that performance contracting can only work in case of an absolute reliability of the supplier respectively the supplying network.
(4) Performance contracting goes along with a significant degree of (mutual) dependence. In addition, from the customer's point of view the reduction of transaction specific risks provides some background in order to explain the decreasing price sensitiveness of the customer.
(5) As mentioned above: Performance contracting is based upon a very high degree of specificity. However, this is not a state of idiosyncrasy. Therefore, the opportunity for the supplier exists to make use of a particular asset set not only in one customer relationship but even in others. This offers at least some room for realizing economies of scale.

To sum it up, performance contracting responds to several challenges of the market process. Especially, it offers the opportunity to reduce the risks of the transaction in a customer-oriented way. Moreover, the specificity of the solution allows a high degree of effectiveness as well as transaction cost efficiency. All in all, in the mechanical engineering industry a setting can be identified where very close customer/supplier interaction, as we can find it in performance contracting solutions, makes sense.

A significant limitation of the transaction cost approach is about the limited opportunities to address the different production costs of single transaction designs. Another weakness of transaction cost economy is about the fact that hierarchical coordination seems to be over-estimated. Especially network coordination, as one particular mode of "coordination by cooperation" (Richardson 1972), could exceed the possibilities of vertical integration. However, this cannot adequately be addressed by the transaction cost approach.

A Resource-Dependence View on Performance Contracting

The resource dependence approach was put forward in particular by Van de Ven (1976), Pfeffer/Salancik (1978) and Gils (1984). The leading argument is that firms cannot survive if they only rely on internal resources. Outside the firm there are several critical resources a firm depends on. Therefore, one major problem of management is about establishing relationships to the respective resource owners and to make arrangements in order to get access to such critical resources the owners control. This clearly indicates the dependence of every single firm. In order to arrange a certain autonomy in making decisions, the management has to find ways to control such situations.

Analyzing the circumstances of performance contracting, a resource dependence analysis makes sense with regard to the supply side as well as concerning the customer. In this section, a supplier perspective will represent the background. First of all and according to the marketing concept, the supplier depends on the critical and scarce resource 'demand'. Second, the challenges of performance contracting are very tough so that it does not make sense to provide all the elements of the total product bundle by a single firm. Especially financial resources and industry-specific know how need to be pooled in a way that it exceeds the possibilities of one firm. This applies to small and medium-sized firms in particular. This matter of fact exerts substantial pressure on a firm to find out well-fitting partners. Therefore, this argument clearly stresses the necessity of building a supplier network based on the resource dependence approach. However, to be dependent on other parties is a critical state which needs some managerial action in order to avoid a critical loss of autonomy.

According to Pfeffer/Salancik (1978), the resource dependence approach offers some options to respond to these challenges:

- First of all, vertical integration can take place. In the particular setting of performance contracting this would only make sense in some very specific situations when a substantial degree of control is necessary. A total integration approach would contradict the network logic as described above and could not be implemented as usually vertical integration implies a transaction where the integrating firms has to give resources in a takeover transaction in order to make integration real.
- Second and even more relevant in case of performance contracting is cooperation. Cooperation can take place in various modes (Thompson 1967, p. 34-36). It is possible that *contractual agreements* represent the basis of cooperation. They are useful to stabilize interorganizational relationships by creating a 'negotiated environment'. A second mode is about *co-optation* resting upon personal interconnections and entanglements. Co-optation can be necessary if the threats of dangerous third-parties have to be neutralized. The third alternative is about *coalitions* (i.e. cartels, joint ventures, alliances). Coalitions

are able in order to reduce uncertainty. On the other hand side, coalitions can go along with a loss of autonomy.

Performance contracting in terms of the resource dependence approach represents a way of cooperation which could make sense due to the opportunity to access external resources which can be critical in the face of actual and future developments. The resource dependence view indicates that contracting solutions can, in particular, consist of the following elements:

- Contract elements – every kind of performance contracting needs a certain 'contractual infrastructure'. However, it remains open how far the different parties make use of this option.
- Co-optation – performance contracting implies that the supplier respectively the supplying network could get access to the personnel of the customer. Especially the operation and maintenance crew is a critical resource because of the embedded knowledge. Inversely, the customer gets access to employees of the supply side who act more or less exclusively for the customer and get permanently in touch with his problems.
- Coalitions – the ties between firms which are not necessarily based on contract but even based on trust and commitment (Morgan/Hunt 1994) are useful in order to manage the problems of power-based threats of external parties.

Based on this, it is worth mentioning that a resource dependence analysis is not only able to explain why performance contracting arrangements emerge. Moreover, some important conclusions can be drawn concerning the way how to handle this mode of coordination.

The Resource- and Competence-based View and Performance Contracting

The resource-based view as developed by i.e. Teece (1982 & 1984), Rumelt (1984), Wernerfelt (1984), Barney (1986 & 1991), Grant (1991 & 1995), Dierickx/Cool (1989), Amit/Schoemaker (1993), Peteraf (1993), Hamel (1994), Sanchez/Heene/Thomas (1996) assumes that every firm is characterized by a unique resource endowment. This uniqueness is based upon idiosyncratic management decisions over time which causes a firm-specific trajectory. As every firm acts in a particular surrounding, idiosyncratic knowledge will be gathered over time and embedded within the organisation. The state of uniqueness is a permanent one because no other party in the market is able to follow an absolute identical path of organisational development. As a consequence, not only distinctiveness can be conserved. Moreover, every firm is able to make use of and to activate the so-called "isolating mechanisms" (i.e. Rumelt 1984, Dierickx/Cool 1989, Teece/Pisano/Shuen 1990, Barney 1991) protecting the competitive advantages of firms vis-à-vis its competitors. Those elements of isolating firms from imitation and substitution efforts of competitors are in

particular tacit knowledge, social complexity, asset mass efficiencies, time compression diseconomies, and causal ambiguity (i.e. Dierickx/Cool 1989).

Asymmetrical resource endowments between firms are the reason why firms are engaged in interfirm collaboration in general and in performance contracting in particular. Sanchez, Heene, and Thomas (1996, p. 7) use the term "firm-addressable resources" in order to stress that there are important assets outside the firm "which a firm does not own or tightly control, but which it can arrange to access and use from time to time". Those firm-addressable resources are relevant to explaining the up-and-coming contracting solutions in mechanical engineering, as it will be explicated below. Moreover, they are able to explain the limitations of hierarchical coordination and the network superiority which can often be observed in recent market settings:

- The customer is able to accumulate substantial know how over time due to employing a operation and maintenance team. However, the work of his personnel depends on a close interaction with supplier's experts because otherwise there are often knowledge gaps of the customer's crew with regard to recognising the substantial technical opportunities, up-to-date machines are offering. In resource-based terms the situation is about substantial intraorganizational know how and well-working routines (Nelson/Winter 1982, Langlois/Robertson 1995) within the firm of the customer. Organizational routines are according to Grant (1991, p. 122) "(…) regular and predictable patterns of activity which are made up of a sequence of coordinated actions by individuals". Cohen/Bacdayan (1994, p. 554) add that routines are "(…) multi-actor, interlocking, reciprocally-triggered sequences of action". The problem of the traditional product business is that customer's and supplier's knowledge as well as routines need to be interwoven but they are too often standing alone. Therefore synergetic effects cannot be triggered off in an effective way. Performance contracting, instead, rest on at least close interaction between customer's and supplier's expertise and personnel. More subtle ways of contracting imply that parts of the customer's operation and maintenance crew will switch and be employed by the supplier. As a consequence, the customer will concentrate himself on his real 'core business' whereas the supplier respectively the supplying network will stand to gain much from the knowledge which will be transferred this way. By analyzing the situation in different industries, in particular in the markets of power plants, very many customers reported that this opportunity is maybe the basic reason why they made use of performance contracting. Indeed, the resource-based view appears to be useful to explaining this important facet of contracting transaction designs.
- One single supplier is often unable to pool all the know how of different industries relevant to delivering up-to-date machinery parks. In detail, the business of selling machines is based upon pooling different knowledge such as software engineering, mechanical engineering, sometimes plant engineering, and very often financial

engineering. One single supplier, especially in case of small and medium-sized firms, is not able to respond to the different challenges of the complex business in a competitive way. In the face of the fact that supplying collectives (Astley/Fombrun 1983) are able to pool the required expertise and as they are in a position to improve collaboration over time by mutual organisational learning, this gives rise to the impression that strategic networking is a superior way compared with more or less loose ways of interfirm cooperation respectively acting autonomously. However, this state indicates that the supply side should be engaged in building network competence, as introduced by Gemünden/Ritter (1998), in order to make use of firm-addressable resources in a more effective way.

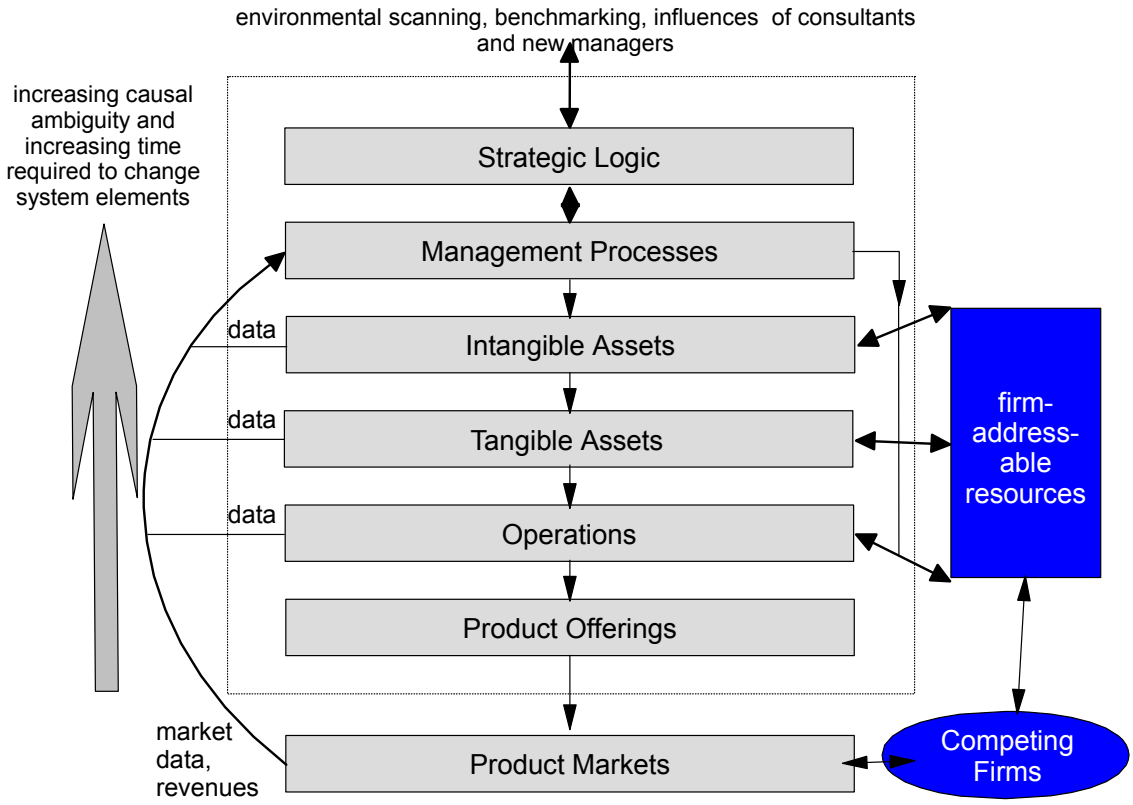

Figure 1: The Open Systems View of the Firm (Sanchez/Heene 1997, p. 17)

- Given that the resource-based view is able to highlight the necessity of accessing firm-addressable resources, the success of networking activities, as they are typical for performance contracting, depends on the so-called "absorptive capacity", as put forward by Cohen/Levinthal (1990). Absorptive capacity means the "(...) ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen/Levinthal 1990, p. 128). Therefore, if topics of accessing firm-addressable resources are to be considered, the notion of absorptive capacity is helpful in order to understand the integration process according to figure 1 in a better way. Concerning

contracting arrangements, a firm needs to be alert in order to *identify* well-fitting network partners with an asset profile complementary to the own asset endowment. Among the partners even customers with a respective resource and competence profile play a role. This kind of alertness depends on the knowledge accumulated over time. Moreover, the second step is about the *integration* of external resources, in particular external knowledge. To do so, the firm needs to build up routines as mentioned above. The routines represent in a certain way a knowledge repository enabling the firm to find new resource structures in order to provide the required services. Last not least, the absorptive capacity also incorporates the ability to *apply* a restructured and reinforced resource net to commercial ends. That means that the common resource infrastructure of a customer/supplier network needs to be adapted to the market needs. The total absorptive capacity, consisting of the three different elements, increases over time and depends on the accompanying deployment of routines. This prepares the ground for setting free asset mass efficiencies (Dierickx/Cool 1989) by making use of a much broader asset base and by connecting the corresponding asset stocks and flows in a synergetic way.

All in all, the resource-based view focuses upon building up intra- and interorganizational routines. Those routines are basic in order to develop organizational competencies. The argument here in this section clearly underlines the impression that the resource-based view does not offer a pure inside out-oriented perspective. Instead it is becoming clear that the value of any asset depends on the relevance to product markets. In this particular setting, competitive advantage is not (only) bound to a single firm but to a network of suppliers.

Performance Contracting and Schumpeter's View on Entrepreneurship

Schumpeter developed a framework of the dynamic entrepreneur which focuses upon the development of new products. It is possible to state that Schumpeter's argument is based on tangible products. Services do not play an explicit role. This is not very surprising because Schumpeter did not live in the "service economy". Nevertheless, his way of thinking also applies to service innovations. This is the reason why it could make sense to address his theory of entrepreneurship in this paper.

Schumpeter does not pay too much attention at inventions because in his view inventions only add some more options to the enormous variety of already existing options (Schumpeter 1934). What is even more important to him is the innovation process itself with all its obstacles to overcome. He states that the core of entrepreneurship is nothing else but to recognize and to implement new business opportunities (Schumpeter 1928, p. 483). His innovation process consists of five different steps:

1. generating and implementing new technical products respectively new product qualities,

2. finding out new ways of production,
3. establishing new organizational solutions,
4. building up new product markets,
5. finding out new supply sources and purchasing markets.

Abstaining from fundamental criticism of Schumpeter's point of view for a while, he proposes a comprehensive model which is obviously relevant to explaining the development of new service offerings, too. Developing new service offerings and to implement a service-driven solution are in a certain way nothing else but the two sides of the same coin: The entrepreneur recognizes the chance to increase his profits by new services. However, in terms of modern strategic management a fit between the new "product" and the way of marketing is necessary. This implies new ways to organize the transaction process (step 3 in Schumpeter's innovation process) and to offer the solution to target customers (step 4). The reason why Schumpeter's view offers new insights concerning performance contracting is that he sheds some light on the other steps of his innovation process which seem to be neglected so far.

Schumpeter's entrepreneur is able to earn superior profits as long as the imitators fail to copy the web of innovations which are closely intertwined. Despite the fact that this view deals with the neoclassical notion of a market equilibrium which does not fit to the particular setting of performance contracting in mechanical engineering and which represents an inconsistency in his argument: this notion is useful in order to understand why many firms try to be engaged in developing new offerings in this market. Therefore it helps to explain the diffusion process of performance contracting. Moreover, it stresses that the development of services in performance contracting relies upon persons behaving in an entrepreneurial way and performing the functions of an executive. This gives rise to the impression that Schumpeter's theory could be an important cornerstone if performance contracting should be analyzed in theoretical terms.

Empirical Observations

The question arises whether the theoretical insights correspond to the first empirical observations. As performance contracting is an innovative topic in the particular field of mechanical engineering, it is not possible at the moment to start a representative survey. However, it seemed to be useful to confront the respective firms, being project partners in the “Invest-S” research project, with the concept of performance contracting in order to get impressions concerning the perceived opportunities and threats. Therefore, several in-depth interview with the 9 partner firms were started. It is up to this section to give an overview of the most important findings of the interviews. The intention of this part is to contribute to a

deeper understanding of the issues of performance contracting in mechanical engineering and to estimate the strengths and weaknesses of this transaction design.

Firstly, the perceived opportunities and threats of the customers will be discussed. Among the project partners, there are two firms to be regarded as customers. Table 1 offers an overview of the risks and motives and tries to indicate how far it is possible to link the impressions with the theoretical approaches as introduced in the preceding chapter.

Demand Side							
TAC	RDA/RBV	Entr.Th.	Motives	Risks	TAC	RDA/RBV	Entr.Th.
		X	concentration on core business	loss of know how		X	
X			reducing uncertainty	dependence		X	
	X		integration of external know how	bad supplier selection			X
	X		better allocation of limited resources (e.g. personnel, liquidity)	Economic Risks (Lack of Controlling Instruments)			X
	X	X	increased flexibility	conduct			X
		X	improved performance				
		X	reducing cost pressure				

Abbreviations

TAC = Transaction Cost Approach
RDA = Resource Dependence Approach
RBV = Resource Based View
Entr. Th. = Theory of Entrepreneurship by Schumpeter

Table 1: Motives and Risks of Performance Contracting – A Customer Perspective

Customers in industrial markets are (by definition) enterprises purchasing goods in order to provide solutions to be marketed at the next step of the value chain. Because of the high level of competition in these markets those enterprises have to focus on the core activities of their business without neglecting the other activities that have to be rendered to stay in competition. Co-operation in performance contracting networks appear to be one possible way to provide these services without bonding critical resources in activities that do not result in competition advantages.

Outsourcing efforts - including performance contracting - bear the important risk of losing internal know how. On the one hand side the erosion of know how leads directly to dependencies on special suppliers because it takes lots of time to recreate the respective know-how and in most cases other suppliers cannot be chosen because of the multitude of adaptations necessary between customer and supplier. On the other hand side the risk of

forward integration by the supplier increases because of important knowledge he gathers during the cooperation.

Furthermore adaptations may have different impacts. As long as both partners have to adapt their resources (i.e. personnel, processes) there is a mutual dependence. But if only one side has to conduct adaptations the other side will be able to behave in a strategic way. These reflections are based on ideas concerning game theoretical measures. Further examination towards this direction is necessary to find mechanisms to avoid strategic behaviour from both sides.

But exactly these external resources the customer acquires bear some important potentials. First of all the customer is free to concentrate on his core business as long as a supplier provides services that cannot be neglected though they are not belonging to the core activities. Internal resources having been used in activities and processes not belonging to the customer's core business before then can be allocated to more efficient and effective areas. As a result performance contracting with a specialised partner may lead to cost reduction and/or a better performance of the overall product because of an increased resource allocation. Beside this the customer's uncertainty is reduced because the risk of capacity shifts from the demand side to the supply side. Especially the reduction of uncertainty is a factor of major importance for customers to enter in contracting solutions.

Potentials for improved flexibility can best be identified by a comparison of the customer's payments between the purchase of a machine/plant and performance contracting. If the customer makes a buying decision, capital is bond and liquidity will be reduced. Contracting solutions on the other side offer the possibility to pay for performance; in an ideal case this means that the customer first earns his profits and then he pays for the provided services. By this new way of conducting business, fixed costs turn to variable costs.

On the supplier's side contracting solutions provide some important potentials for improved performance in competition but nevertheless a few risk have to be taken into consideration. In table 2 we present the motives and risks we identified on the supply side.

Supply Side							
TAC	RDA/RBV	Entr.Th.	Motives	Risks	TAC	RDA/RBV	Entr.Th.
		X	developing markets	economic risks			X
		X	increasing the degree of customization	lacking resources (especially personell)		X	X
X		X	bonding customers	measurement/controlling			X
		X	differentiation advantage	performance risks			X
		X	leeway for price increases	managing supplier networks	X	X	

Table 2: Supply Side's Motives and Risks of Performance Contracting

One of the major problems for the supplier in performance contracting is the calculation and the handling of increased volume of risks he has to bear. In common ways of conducting business the customer had to bear the capacity risk but contracting solutions imply a shift of this risk towards the supplier though his influence on the overall output and on the demand is very limited most times. On the cost side the supplier is lacking in information concerning the services which are to be provided. In particular, the volume of time that has to be spent for maintenance efforts cannot be calculated at the moment because only the customer has got the necessary information. This problem increases if not only calculation of time but calculation of overall maintenance costs is to be done. The reason why this problem exists are limited opportunities of service controlling instruments. Beside this unforeseeable technical innovations hamper exact cost planning because revamping or even the construction of totally new machines/plants might become necessary if technical standards will be improved. There are important problems as to the sales situation, too. The supplier provides the infrastructure to render the demanded services - that means considerable financial assets are bond. However, quite often he is uncertain as to the expected sales volume of the contracting project.

Furthermore, deficits were identified in some critical resources, especially concerning qualified personnel. Most companies reported to have a very limited pool of service experts or even had no qualified service personnel at all. The corresponding gaps can be closed in the short run neither by recruitment activities in the personnel market nor by internal development programs. Therefore, this problem appears to be even more important than any other. However, the firms are sure that it is absolutely necessary to find a way to qualify service experts in the long run.

Last but not least, other important problems arise if there is not only a single supplier rendering the whole range of services but if the services are generated by a network of companies. The diversity of services to be provided makes it necessary to cooperate but the

network organisation bears some further risks and problems which have to be taken into account:

- Finding a goal for the whole network's and for each partner's success is a first threat which can hardly be over-estimated. The overall network success is uncertain, if there is no agreement concerning the overall goal or if the partner's are behaving in a too opportunistic way. Negative influences on synergy effects, on product quality and on adaptation advantages can be evoked by selfish acting of single partners. A special problem in this way of conducting business is that one supplier is allowed to take part in several separate networks. Therefore it is very important to create a compensatory and flexible system of incentives and contributions, because contracts are often incomplete and cause a high degree of transaction costs.
- To safeguard a flexible response to changing customer needs, in recent years a lot of companies have turned to establish highly flexible decentralised structures. This way of co-ordination includes the risk that decentralised units create solutions being excellent for the respective area, but these solutions can be combined as service packages only by high co-ordination expenditure or even cannot be combined at all. Especially coordination of single competencies and activities seem to be an important strategic factor in networks consisting of several partners coming from different industries. To link coordination advantages of centralisation with the flexibility of decentralised structures, a combination of both ways of coordination might be chosen. Within this combination, a central office coordinates the activities of sub-networks internally. Structural problems always concern the strategic level of the company or network.
- On the same level one can find the question how the customer is to be integrated into the network. According to empirical studies especially in high technology areas customers can contribute significantly to the success of innovations by generating important ideas or even by developing new products (von Hippel 1986 termed these customers as "lead users"). Furthermore the customer's reference potential can play an important role to the selling and (directly linked) success of service packages. Considering this background a close cooperation with customers seems to be an adequate strategy. Again, it is not completely clear which kind of network structure increases efficiency and effectiveness. The arising problems can be compared with the problems the suppliers have one beneath the other. A decentralised organisation supports the interactive exchange of information, but on the other hand side it is combined with high coordination expenses. The advantage of a single partner to speak to is offered by the choice of a centralised structure, but the risk is included that important information gets lost on the way through different levels of communication. Furthermore a central office protects the network against loss of information towards the customer if the customer reaches for backward integration. Because of the multitude of single services, that have to be provided and the combination of those that kind of downwards integration is highly unlikely.

As a counterpart of the dangerous risks combined with performance contracting important opportunities can be identified. First of all, these innovations of organising business processes offer possibilities to realise “first mover advantages”. These advantages can occur on different levels:

- Suppliers (as well as customers) being first to the new markets face a situation where they have a high potential to create the shape of those markets according to their purpose. When a certain structure of the market as well as particular standards are established by first movers, these institutions can represent entry barriers to newcomers.
- In new markets often extraordinary profits can be earned by first-to-market suppliers. Because of the advantages, performance contracting offers to the customers, it appears very likely that this innovation bears the potential to be established beside the common ways of conducting business. Suppliers being able to serve the customer’s needs as early actors in this new markets can earn extraordinary profits before a decrease of prices starts by the entry of further enterprises.

The customers needs of a combination of high-quality machines/plants and high-performance services can only be served by very a few specialized qualified suppliers or supplier networks. Suppliers being able to build respective machines/plants and to provide the demanded services can improve the customer’s benefit. On the one hand side, this increased customer benefit might result in closer relationships and long-term profits. But it appears to be of major importance to avoid a feeling of inflexibility for the customer by long-term contracts. Especially relational contracts (in contrast to classic or neoclassic ones; Williamson 1983) fixing a certain legal frame for the collaboration while offering enough leeway to react on changing circumstances appear to be an appropriate means to guarantee a successful long-term cooperation. On the other hand side, increased benefits of some customers can lead to improved potentials for acquiring new customers. Successful cooperations often become generally known in the respective industries. Therefore, successful suppliers/supplier networks gain positive reputation facilitating them to acquire new customers more easily.

Beside these potentials of acquiring new and tying actual customers, it appears to be possible for the supplier to price up service and to get rid of providing them free of charge, as it is common practice in recent business. A bundle price, based on the ‘pay for performance’ principle of performance contracting includes all services being provided without giving to know the customer the single price of each single service. The customer just has to compare the overall price he has pay to the supplier with his overall cost when he purchases the machine and provides the necessary services himself or gets them separately from the supplier or special service providers.

Conclusion

Facing the changing conditions of competition, performance contracting is a feasible new way of conducting business to overcome the arising problems. Entrepreneurs

- willing to offer performance solutions as a further option beside their actual range of products/services and
- being able to acquire suitable partners as well as to organise themselves in successful networks

face important potentials. On the other hand side customers, have multiple chances to improve their situation. But nevertheless some risks and barriers which have to be taken into account before firms participate in contracting solutions.

Quite obviously, theoretical considerations and empirical observations fit together well. However, there is much more conceptual and empirical work to be done. A next step is about examining the first projects of performance contracting as to the following topics:

- criteria of the customer to make a choice,
- determinants of customer satisfaction in this particular setting,
- measuring the performance effects of contracting solutions,
- relevance of customer's and supplier's obstacles to make use of performance contracting.

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