STRATEGIC RELATIONSHIP BETWEEN QUALITY MANAGEMENT AND PRODUCT INNOVATION

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This article investigates strategic linkages between quality management and innovation. It also defines their role in companies' value chains, and consequentially, in their competitive strategy. It attempts to formulate the relationship between quality management and innovation in strategic management terms and indicate areas of application of this relationship in practice.

INTRODUCTION

Quality management and assurance have for a long time been considered part of manufacturing (operations) strategy. Some time ago, researchers began to view quality as a set of activities interlinked with the overall strategy of an enterprise. They indicated that manufacturing strategy should not be formulated and implemented in a strategic vacuum but rather should specifically strengthen the strategic position of the company (e. g. Parthasarthy & Sethi, 1992).

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Since Deming, there has been a strong thrust towards regarding quality as a long-term, comprehensive, and continuous process. This view replaced the old understanding of quality as a definite, one-time occurrence resulting in spectacular technological and/or organizational breakthrough improvements. The concept of quality which is dominant now emphasizes that processual continuity, long-run vision, and comprehensibility should extend to all dovetailing functions of the enterprise in the process of value creation. This concept is strikingly similar to the modern concept of innovation which is also considered a continuous, strategic, functionally complex, interactive and value-creating process rather than a one time event.

A deeply rooted and well documented opinion indicates that quality creation should not be treated as a process confined to the organizational boundaries of an enterprise. Rather, this process should extend vertically backwards, towards suppliers and even onwards, to customers. The proposed system of quality, with respect to suppliers undoubtedly inspired by the Japanese manufacturing practices, results in a highly integrated quality pyramid where suppliers have their own quality supplies (Cusmano & Takeishi, 1991). In its onward direction, the system induces companies to create advantages of educated users coping well with the technology embodied in the product.

During the organizational process execution measures targeted at innovation and these targeted at quality must somehow dovetail or interact. Despite the inevitability of this occurrence, the exact areas on which both processes appear together, the most important features of their common occurrence, as well as the consequences of their linkage have not yet been identified or properly analyzed. This article attempts to fill this gap in the management theory.

THE GENERAL ROLE OF QUALITY AND INNOVATION IN BUSINESS STRATEGY

General and utilitarian view on technology development indicates that technical advances do not automatically mean progress understood as a move of large societal groups to a higher level of efficiency. This view emphasizes that such a move occurs only if additional value is created and then shifted to wide societal groups (Marx, 1987). Real innovation and/or quality improvements are such technical or organizational advancements which represent an increase of value and provide for a mechanism to shift it to the customer. Thus, they qualify as mechanisms through which societal progress occurs. From this standpoint, value increase is also a qualifier that makes it possible to distinguish between a genuine innovation from other, non-innovative technological improvements (Nowak, 1996). In comparison, since not all quality increases represent genuinely new solutions, innovativeness of quality enhancement and real outputs of this enhancement can be used in measuring the depth and the quality of a change introduced through application of quality enhancing measures.

Value increase is the bottom line qualifier of the real quality improvement and innovation. However, from this point of view, it is imperative to make a

distinction between quality creation and quality assurance (maintenance). The former is focused on enhancing the customer value. Thus, it is similar, or even represents an integral part, of innovation. Quality assurance represent a wide range of activities focused on maintenance of the already achieved level of value embodied in the product or service.

Having in mind this basic distinction, it is worthwhile to evaluate the role of innovation and quality creation system for the strategic posture of the company.

QUALITY MANAGEMENT AS A STRATEGIC ISSUE

According to a widely spread concept, from the consumer's perspective, quality represents compliance with his expectations perceived in terms of appearance (æstetics), operation, reliability (Stevenson, 1990), and safety (Fearson et al., 1979). An impressive wave of technological breakthrough innovation which has taken place in last 20 years resulted in a substantial broadening of the concept of quality. According to this newer concept, quality can also be measured by expendability, upgrade ability, recyclability, or ease of assembly of the product (Sisodia, 1992). Researchers indicate that quality can affect an organization through *reputation and image* (associated with both cost and quality), *liability* (legal recourse customers may take in the case of damages or injuries resulting from either faulty design or poor workmanship), *productivity* (where quality of material, components, semiproducts, machinery, equipment used in the production process impacts its speed and quality), and *costs* (Stevenson, 1990).

Quality processes are executed within two fields: quality assurance and quality management. Quality assurance is concerned with the entire production process, beginning with product or service design, continuing through the transformation process, and extending to service after delivery (Stevenson, 1990). Quality assurance is divided into two major areas of evaluation: quality of design (referring to the intention of the designer embodied in certain features of a good or service) and quality of conformance (referring to the degree to which goods and services conform to the intent of design). Quality management is a more comprehensive process aimed at value creation. It involves all functions within the value chain of the enterprise. Quality management strives to organize these functions in such a manner which would make them focused on quality, understood not only as a result of action but also as means to achieve these results.

Quality benefits shifted to customers measured in terms of *design* (embodying the wants and needs of the customer, as well as production and service capabilities) and *conformance to design*, should be somehow enhanced and balanced internally by the enterprise. This enhancement and balance must occur through adequate *consumer education* (which is making the product and its functions clearly understood for the ultimate user), and *service after delivery* (Stevenson, 1990)

Quality management emphasizes widening boundaries of thinking about quality to all functions of the enterprise (Góralczyk, 1996). It requires consideration of the enterprise in the entirety of its activities and outcomes of these activities in connection to the firm's specific quality objectives. In this view of quality, consistency of distinctive elements of the company management system with objectives set forth for this system is strongly emphasized (Niegowska, 1996).

W. Edwards Deming's ideas regarding quality management include adopting a long-term perspective, demanding quality from vendors, maximizing quality instead of maximizing output at the cost of quality, and proper training of employees (Deming, 1981). Widening limits within which people think about quality and a long-term strategic consideration for all core activities of the company indicate a dominant strategic view on the function of quality as such.

According to one of these strategic views, quality has two basic "intangible" areas of influence on strategic posture of the company. One area is enhancing strategic assets, which are assets underpinning a firm's costs or differentiation advantage in a particular market and which are imperfectly imitable, imperfectly substitutable, and imperfectly tradable and which tend to be market specific. Another area where quality has a major strategic function is the area where core compentences are created and sustained. Core competences represent a pool of experience, knowledge, systems, etc. that exists in the corporation and that can be deployed to reduce the cost or time required either to create a new strategic asset or expand the stock of an existing one. The concept of the strategic function of quality emphasizes the role of asset improvement, creation, and fission as the most important manners of achieving and sustaining competitive advantage, at least in diversified businesses (Markides & Williamson, 1994). In terms of this concept, quality improvement and innovation can be regarded processes leading to strategic asset accumulation. These processes are based on combining tradable inputs with existing asset stocks and learning by doing (Dietrickx & Cool, 1989).

Both quality and innovation enhancing quality are elements on which the competitive strategy of differentiation can be based and through which it can be nurtured (Porter, 1985). Both quality and innovation can also be used as a measure (means) to achieve cost leadership which can also be associated with differentiation. In the case of high concentration on technological innovation-intensive products, they can also enhance the strategy of focus. Irrespective of the choice of competitive strategy, quality creation potential should always be created, sustained and enhanced through creation of conditions for effective management of quality and innovation.

STRATEGIC IMPORTANCE OF R&D IN INNOVATION AND QUALITY MANAGEMENT

Quality management has a lot to do with innovation. It has much in common with incremental innovation. Interorganizational requirements for mak-

ing quality and incremental innovation effective processes are the same for both of them and they appear at tactical and operational levels. Despite their tight connection with the tactical or operational activities of the enterprise, they both have strategic importance. Barrier (1994) once wrote that "what counts ultimately is not a simple innovation—a 'magic bullet' that immunizes a company against the competition—but a climate of innovation that leads to one small triumph after another and makes possible the occasional real breakthrough" (Barrier, 1994).

Both basic and applied R&D seems to be critical to channel all specific resources available to the company in the process of creation of additional value. The organizational linkages of R&D function with other processes is equally critical because it is expected that they all create a mechanism within the company which will make it possible to enhance the additional value and move it towards successful commercialization.

Within the value chain, R&D can be viewed as the trigger of quality and innovation processes, and as the initiator of quality proliferation within the value chain. The latter role of R&D should involve widening some R&D activities or processes throughout all elements of value chain in order to accumulate knowledge and skills already developed in other components of the value chain and to transfer it forward, towards commercialization. As a result, the bottom line function of R&D is to accumulate and somehow logically integrate skills and knowledge through the value chain wide learning process and provide a feedback at all stages of quality improvement or innovation processes. This theoretical presumption has some body of evidence in the already conducted empirical research, which considers quality creation or innovation iterative, probe-learning processes (Franko, 1989; Cusmano, 1988; Kash, 1987; Porter, 1985).

A processual or systematic embracement of quality and innovation in technological and organizational change through widely understood R&D is confirmed by empirical research (Stobaugh, 1988). The research indicates that techno-organizational change is executed within a certain organizational framework which is based on knowledge and skill accumulation and which is essential for technological improvements in either quality or innovation area. Accumulation of skill and knowledge has the form of learning and moves along learning curve. As a result, innovation implementation consequentially has quality enhancing effects, and *vice versa*. The "learning" is expressed through improvement of efficiency of operations and can involve development and commercialization of completely new processes of manufacturing the product, expanding economies of scale, and integrating vertically toward the market so as to limit the open market available to any would-be entrant (Stobaugh, 1988).

Product innovation is often defined in terms of transformation or integration of knowledge and skills which leads to its new, tangible application. For example Stobaugh views production innovation as a set of activities that starts with basic knowledge and ends with a new commercial product of acceptable

quality and available for sale in a quantity and at a price intended to yield profits. Stobaugh (1988) emphasizes that these profits are of monopolistic character.

R&D does not make an organizational distinction between quality management and innovation. In order to perform its integrative function, R&D must be conducted on a specific organizational platform. This platform is an organizational mechanism of organizational learning, retaining knowledge and skills, integrating them, and accumulating so that later on the so accrued potential can be released in a creative effort in value creation processes.

ORGANIZATIONAL PLATFORM FOR INNOVATION AND QUALITY MANAGEMENT

From the point of view of quality and innovation, R&D represents exploration and development of new or different designs for products or different equipment, materials, processes, methods, or packaging which have the potential for yielding quality improvements. Since R&D is targeted also on innovation, it very often links quality and innovation efforts organizationally and functionally. Such a unique role of R&D within the enterprise results in multiplication of objectives set forth for various projects executed within this function. This multiplication very often makes quality and innovation objectives interwoven with each other. This relationship between quality and innovation is consistent with concepts which indicate that objectives of innovation should comprise and conform objectives of quality. Lower cost, higher quality, superior performance, additional performance or new performance are pointed out to be objectives of innovation (e. g. Kash, 1989).

A tight connection of goals and objectives pertaining to innovation in the area of quality improvement in real projects seems to confirm the higher than average possibility of achieving undoubtedly innovative outcomes in the process targeted mainly at quality improvements. An analysis of actions undertaken during the execution of a respective project indicates that, within the vague area where quality and innovation dovetail on one organizational platform, there are three groups of activities relevant for quality and innovation: (a) these targeted at and supporting quality (which can be referred to as *quality-oriented*), (2) these targeted at and supporting innovation (which can be referred to as *innovation-oriented*), and (a) these supporting, channeling or directing both innovation and quality (which can be referred to as *system-oriented*).

Quality-oriented activities focus on achieving maximum compliance with customers' expectations with respect to design, operation, reliability, and safety in the most effective and efficient manner. These activities are nurtured and enhanced within the value chain. They do not necessarily involve specialized or specific resources. Therefore, they can be imitated or substituted by competitors with a greater ease than innovation.

Innovation-oriented activities engage specific and very often specialized resources in order to enhance the value of outcomes of quality-oriented measures and at achieving a high level of compliance with newly emerged, or

even anticipated, customers' expectations (Porter 1990). These activities are targeted at achieving competitive leadership. Hence, it is expected to create barriers of entry. When the innovative leadership is achieved, its highly specialized strategic basis cannot be easily imitated or substituted.

The third group of activities (called system-oriented) create, maintain and enhance the organizational platform for quality-oriented and innovation-oriented actions. It provides organizational and processual mechanisms for proper maintenance and execution of both quality and innovation. System-oriented activities are focused directly on maintenance of the processes of change, so that these processes are properly organized, have adequate speed and right timing. Differences between innovation and quality improvements, otherwise essential, are of no importance for the system-oriented activities. The most important feature of these activities is that they enable and facilitate sharing of specialized knowledge and skills developed during the implementation of any previous and occurring change. They also enhance the mechanisms of information and expertise retaining and systematic accumulation over time. As a result, this system represents a very important vehicle of learning which enhances strategic assets and core competences needed for a more effective and efficient implementation of various innovation or quality processes in future. Thus, system-oriented activities are essential for a sustainable organizational platform.

Deming paid special attention to the organizational platform of quality and innovation processes. He wrote that "controlling variation, eliminating defects, and improving production processes are merely the price of entry in the competitiveness challenge. Equally important is the systematic search for new product (and process) characteristics that will best serve to enhance quality on an ongoing basis. Ultimately, management's job is to hone the entire system so that it is capable of making the leap from continual improvement to continual innovation in whole new product categories the customer has never even contemplated." (Deming quoted by Gabor, 1990).

THE ORGANIZATIONAL PLATFORM AND THE SYSTEM-ORIENTED SUPPORT OF INNOVATION AND QUALITY

Both quality management and innovation activities are aimed at widely understood technology. However, these activities have to be executed on an adequate organizational platform which can be viewed as a core component of the transformation mechanism in this case. According to Sisodia, technology may lay "in the products, in their accompanying element in the processes, tools used to manage and market them". Thus, the core function of the organizational platform in the transformation mechanism can be refined to creation of conditions in which technologies can be converted into marketable goods and services and to providing some framework which enables this conversion of technologies into marketable and competitive goods and services through appropriate organization of processes of change (Sisodia, 1992).

In the modern understanding of quality, the role of processes and structures is emphasized. This emphasis is indicative as to the role of the organizational platform. Since both quality improvement and innovation are channeled and directed through organizational framework of the enterprise, researchers contend that quality has to be strongly associated with organizational innovation (Nowak, 1996; Eells & Walton, 1969). This association involves both product quality and process quality and intermingles them through quality management. Thus, quality management can be considered an integral part of value chain specifically associated with the enhancement of innovation and quality creation. This function of quality management involves maintenance of a continuous match of the technology-oriented aspects of the firm's activities with its overall business strategy according to recommendations formulated in the general concept of strategic fit (e. g. Ensign, 1994). Within the value chain, the organizational factors relevant for innovation and quality creation simultaneously perform parallel to one another in the function of enhancing and increasing value through inbound and outbound functions. They also link these functions and move the outcomes of these functions ahead towards the ultimate value consumers.

Another indication regarding the role of the organizational platform in converting technologies into goods and services is offered by the resource-based view (RBV) on the creation of sustainable competitive advantage. The RBV emphasizes the need to constantly nurture the resources available in a firm in order to maintain their unique characteristics: inimitability, nonsubstituability, and high specialization. This view implies that value of a resource depends upon the firm's combination of resources and the strategic path that the company is following (Black & Boal, 1994). Adequate organization of processes of high quality creation or assurance and continuous innovation processes is thus a must of companies.

Besides obvious value enhancement and value chain linkage function, another basic common feature of the organizational platform and the system-oriented activities is that they ensure necessary techno-organizational balance in the process of quality creation and innovation. Implementation of quality creation and innovation requires balanced, consistent and reliable technological and organizational systems to be present in the enterprise. These systems are coordinated through an effective feedback mechanism between the technological innovation and organizational aspects of the enterprise activities.

This systematic view on the techno-organizational context in which quality improvement and innovation processes occur is consistent with the Deming's concept which essentially considers management a job to be "work on the system" in order to achieve continuous product/process improvement. This view is confirmed and even enriched by the empirical observation indicating that, during the technology development, strategic emphasis reveals remarkable dynamism and involves nurturing and improvement of the organizational platform. Researchers indicate that strategic emphasis shifts from merely technological to the organizational aspect of innovation (Shan & Hamilton,

1991). This shift requires the system's consistency and reliability in quality creation by limiting the level of variation in the enterprise's operations. If this objective is achieved, it also enhances the quality of all processes of change including innovation.

The dominant pattern of quality improvement and innovation prevalent in companies shows substantial organizational similarity. This similarity results from considerable resemblance of quality improvement and innovation processes. Theories of innovation indicate that innovation development occurs through consecutively executed analysis, solution development and implementation (e. g. Rogers, 1991; Stobaugh, 1988). Quality improvement follows basically the same pattern. The Deming concept of quality cycle involves careful planning and designing based on analysis of customers' needs, than development of the product and its analysis followed by the marketing of the product. The final stage of the Deming cycle is testing of the quality, price and features of the product from the standpoint of those who buy the product and those who choose not to buy it. Strong resemblance between the way quality improvement and innovation processes are implemented determines substantial uniformity with which the organizational platform performs its functions.

Quality and innovation activities intermingle with one another. Because of the organizational linkage and closeness of innovation and quality improvements, activities focused on either innovation or on quality are likely to have similar effects in terms of strategic assets and core knowledge accumulation. For this reason empirical research very often indicates considerably broad areas at which improvement activities can be targeted. For example, Lauria (1987), basing on research confirming typical Pareto distribution, calls for a "focused" action intervention in the wide areas of product and process technology and process technology and work organization. Organizational platform should make such a specifically focused, short term action possible. However, this short-term realignment capability of the organizational system should be treated merely as a test or evidence of a more important, long-term adequacy of this system. This long-term adequacy results in an increased company's capability to adjust its organization contingently to changes in its external environment and consequential amendments of its general business strategy (e. g. Cummings & Mohrman, 1987). The platform should also allow for a substantial flexibility of its system-oriented component. This flexibility is needed because innovation and quality improvement processes normally require different organizational treatment. Namely, innovation is developed more effectively in organic organizational structures but it is implemented better in mechanistic structures (Holbek, 1988). In contrast, quality improvement does not necessarily require organizational structures to be organic and rather show substantial propensity to mechanistic structures during both development and implementation stages of the process. Since quality and innovation development and implementation have distinct and rather contrasting organizational needs, the organizational system should also be appropriately differentiated internally in order to allow enough flexibility of

management of various stages of quality improvement and innovation development and implementation (Holbek, 1988; Galbraith, 1986; Duncan, 1973; Wilson, 1966).

QUALITY AND INNOVATION AS COMPETITIVE STRATEGY ISSUES

Strategy involves a bias towards long-term goals and objectives. Quality is a long term issue as well. More specifically, when it comes to quality, there should be no fundamental conflict between long and short-term view on quality. The only important difference arises rather externally. This externally induced difference is that, in the long run, financial pressures play a predominant role and thus can press for lower expenditure on quality enhancing measures. However, because high quality standards can be achieved even through incremental improvements, short-term view on quality may very likely bring about positive long-term quality improvement effects anyway. Such an obvious consistency of impact of short-term and long-term measures does not exist in innovation, which is a less an "accrual" phenomenon. A wave of incremental innovation may not necessarily yield a breakthrough technological or organizational advancement. Therefore, it seems that the difference between long-term and short-term view is irrelevant for innovation.

As a matter of fact, innovation processes strive best in companies which could organize themselves around a long-term vision. In order to make that vision true, companies have to allocate strategically substantial resources for their R&D. The positive relationship between expenditures for R&D and focused, even long-run, improvements in technological and economic performance is evident (Stobaugh, 1989; Franko, 1989).

Long-term vision is a prerequisite for successful quality improvement. One of Deming's Fourteen Quality Points calls for constancy of purpose which entails an unequivocal long-term commitment to invest in and adapt to the challenging requirements of the marketplace. This view represents the antithesis of managing for short-term financial gain. Constancy of purpose involves

> *"the systematic fine-tuning of every function in a corporation around the changes in the company strategy and product line that are needed to meet long-term needs (. . .) Success depends on how well a company evaluates the processes, products, and markets of today to figure out what the customer will want tomorrow, and whether a company has the management conviction to change accordingly" (Gabor, 1990).*

In modern managerial theories continuous innovation is considered to be a core of sustainable competitive advantage (Porter, 1990; Kash, 1989; Stobaugh, 1988). They indicate that, despite major differences between systems of quality management and innovation in terms of imitability and substitutability of their outcomes, there is a considerable uniformity of strategic rewards attain-

able for leaders in successful management of both systems. These rewards are heavily dependent on the extent to which the newly introduced processes are superior to the existing or dominant ones. To evaluate the level of quality and innovation orientation of the systems' management from the point of view of competitive strategy, superiority should be measured mostly by the level to which cost cutting and differentiation potential associated with an improvement has been achieved in comparison to achievements of other market participants.

Researchers specifically focused on quality issues, slightly differently from Porter (1980), indicate that there are three possible competitive strategies available for a firm operating in a particular product or market segment (Parthasarthy & Sethi, 1992):

a) *cost leadership* (with the definition similar to that adopted by Porter);
b) *quality leadership*, based on a thrust to became a leader in industry through achieving high standards in the product performance, reliability and features, but not necessarily at the lowest possible cost, and
c) *flexibility*, based on competing in several segmented markets by satisfying market needs for product mix, volume mix, quality, and innovation in a cost effective manner (I. e. in the Porter's terms, through maximizing differentiation without compromising low cost).

Parthasarthy and Sethi distinguish between *scope flexibility* and *changeover flexibility*. The former is associated with product variety, volume flexibility and custom production. The latter is measured especially by product introductions, minimizing the R&D manufacturing-marketing lead time, fast delivery, and product R&D (Parthasarthy & Sethi, 1992). Quality innovation is more likely to be strongly emphasized in the changeover flexibility strategy.

Some innovation improvement and innovation is internally sourced, yet to some extent externally motivated. This kind of stimulation represents an inside-out thrust towards increasing value. In addition to internal sources, external stimuli can be major motivators in formulation and implementation of competitive strategy based on quality improvement and/or innovation. Porter (1990) emphasizes stimulatory role of high technological and safety standards for value chain activities. Baba (1989) notes that at least in scale-sensitive industries strategic differentiation at a point of market saturation within industries, and an increase governmental and societal push for national demand for energy saving and material saving. The researchers indicate that after this point has been reached cost cutting based on economies of scale becomes strategically less important than product differentiation (Baba, 1989).

Stobaugh indicates that innovation has a systematic pattern according to which minor, incremental innovation normally faces subsequent competition from other processes developed later. In contrast, revolutionary innovation is much less likely to face instant competition from a subsequent breakthrough innovation. Rather, the revolutionary advancement is subsequently nurtured through a wave of incremental improvements. The pattern also suggest that

eventually, the limits of technology are approached and further R&D spending on process development may yield meager results. (e. g. Foster referring to McKinzey's S-curve, Stobaugh, 1988, confirmed by Sisodia, 1992). Although quality is definitely feasible for imitation, no such pattern as identified in innovation processes has yet been observed with respect to quality improvements.

There is a worthwhile difference between quality management and innovation impact on strategy. Namely, quality seems to be sticky to the existing technology and sometimes even to the overall strategic paradigm of the industry in which the company operates. This situation can be strategically dangerous for the company. Innovation viewed from this point involves such quality improvements which are major departures from the strategic paradigms. Therefore, they overcome this stickiness. Innovation is a challenge to the strategic paradigms and often destroy them (Hayashi, 1978).

A part of the strategic stickiness is reflected through the influence of technology on the firm's organizational structure. In this case, technology is said to determine the way the company is organized. More broadly, this influence is often described in terms of the integration among product, design, marketing functions, and technological competencies (e. g. Dean & Susman, 1989). Some researchers indicate that both technology and organization of the company are major constraining elements for its strategy formulation and implementation. They conclude that a firm's choice of business strategy depends upon its manufacturing competences, the constraints posed by the firm's internal factors which include technology, structure, and the demands of the external environment (Parthasathy & Sethi, 1992).

The strategic stickiness seems to show some affinity to the accumulation of knowledge and skills which are essential for upgrading strategic assets and core competences. This affinity seems to be transferred onto the strategic behaviors of companies in respective industries. For example, it has been reported that in emerging growth industries, more competitive actions and responses of greater magnitude occur. These actions are characterized by lower response imitation and slower response time. In contradiction, in fragmented and mature industries, less actions, higher response imitation and quicker response occur (Smith, 1992). This remarkable difference can be explained by lower and fairly unfocused knowledge and skills accumulation in newer industries in comparison to fragmented and mature industries, where greater amount of knowledge and skills has been accumulated and where it occurs in a focused manner.

DISCUSSION AND CONCLUSIONS

Quality management and innovation involve or even represent strategic choice of a company. They are natural corollaries to the firm strategic choice (Parthasarthy & Sethi, 1992). They represent two of the most important considerations of the firm's strategy. Since the organization of the company is sub-

ject to the principle according to which "structure follows strategy" (Chandler, 1962), ultimately quality management and innovation implementation occurs in organizational system determined by relatively basic strategic choices. In practice, enterprises tend to use primarily the same organizational systems for innovation and quality management. These systems can be referred to as the organizational platform for the processes of change. The technological side of quality management, innovation and their common organizational platform should all match each other. R&D processes including mechanism for prompt commercialization of their outputs represent a major group of activities executed on the organizational platform. Innovation and quality creation processes are channeled and directed within the same techno-organizational system and thus they benefit from the same measures targeted at enhancing values. They also strive in the same organizational climate.

Quality and innovation processes are interlinked and should not be treated separately. Technical change not enhancing quality (and such is sometimes noticed) is illusive because it does not contribute to a sustained and improved strategic competitive advantage, nor it increases value creation potential of available resources through quality creation. It only shifts resources or makes different use of them. Irrespective or whether incremental or breakthrough, innovation should be identified by its impact on the cost of production and quality which can be transferred into competitive advantage through strategies of cost leadership and differentiation, or, according to yet another concept, quality leadership and flexibility.

Both quality and innovation should increase value. Hence, the mere reduction of cost without maintaining high quality standards, cannot be considered quality. To be considered innovation, technological change should increase marginal quality in excess of the marginal increase of cost.

Because of the identified pattern of the mutual interaction between technological and organizational side of innovation in which technological change is substantially handicapped in the case of lack or inadequacy of a matching organizational improvement, neither innovation nor quality increase is possible only through a technological change. Organizational innovation and organizational quality improvement is equally decisive to the technological improvements (Nowak, 1996). A similar match must occur between quality system and organization in order to make quality fully implementable and sustainable.

Following Deming's idea emphasizing the enhancing impact of well designed processes on quality, we contend that quality management involves a very strong organizational element. Within an effective organizational system, technological innovation and quality management reinforce one another. This mutual, two-directional reinforcement enhances the firm's tangible and intangible basis of this competitive advantage and becomes the platform on which this advantage is being nurtured.

The system which can serve as the platform for accumulating and nurturing the basis of competitive advantage should be characterized by internal

discipline and clear standards. It has to include a fast-cycle feedback among different parts of the business organization and consistent sanctions aimed at correction of not acceptable situations. It should also ensure organizational climate where a stretch of standards and ambitions in favor of quality resulting in shared ambition and personal dedication to quality can occur. The organizational climate of companies enjoying the adequate and sustainable organizational platform for nurturing the basis of its competitive advantage, involves trust expressed in equity, involvement, competence, accompanied by guidance and help from higher levels of management (Ghoshal & Bartlett, 1994).

Division of quality and innovation is, to some substantial extent, largely theoretical, not practical. In practice, because of the self-reinforcing and dual-direction character of the impact quality management and innovation have on one another, firms seek quality through innovation or innovate through quality improvement. They are using the same organizational platform to execute projects regarding innovation as well as quality. Because the organizational platform is so important in both areas where additional value is created, companies should constantly improve their organizations and achieve a high level of adjustment flexibility with respect to changes in the internal and external environment. Strategically, companies should tend to achieve such a level of expertise in sensing the need for organizational changes and executing them with speed and at the momentum adequate to nature of changes affecting their strategic postures, to become self-designing organization.

Innovation and quality, understood as socio-economic systems or functions, show considerable affinity to one another. Effective innovation and quality result in strategic uniqueness of assets and/or competences. These assets and competences can be accumulated. Over time, they become a basis for creation and maintenance of strategic advantage. Both innovation and quality management have processual character and are executed through the same, comprehensive organizational platform. The main function of this platform is to ensure that additional value (measured in terms of the company outputs' possibility to fulfill the customer's needs) is created and shifted ahead to the ultimate consumer. Since the ultimate user's needs are thus at stake here, companies have be sensitive to these needs. This point can be even extended onto innovation. Innovation and quality management can be regarded systems of compliance of the elements comprising the firm with the demands posed by the external elements. Since both processes involve customers' needs, both are triggered by the same phenomena and require similar techno-organizational feedback. Last but not least, innovation and quality can be used as measures of the firm's performance or efficacy. They also interrelate with other elements of the company's activities.

One of the most important differences between quality improvement and innovation is their different stickiness to strategic paradigm of the industry. Quality seems to be relatively sticky to this paradigm whilst innovation rep-

resents a major departure from it. Revolutionary innovation can very often even destroy the industry techno-organizational paradigm.

Another major facet of this strategic difference between quality and innovation is their different propensity to become a trigger or a core to a revolutionary technological change within the company, especially in cases where the company has managed to muster its present technology and organization based on a substantial knowledge and skills accumulation.

Quality management and innovation have strategically different roles. Innovation should be emphasized in strategically volatile conditions, where concentration on defending strategic positions would be inconsistent with the external environment, and where strategic necessity is to introduce change which can amend the rules of competition and other elements of the strategic paradigm of the industry in which the company operates. Quality can be emphasized, even at the expense of revolutionary innovation, in strategically stabilized industries since it nurtures and improves, but does not seem to revolutionary change, the sources of competitive advantage. Quality does not have a strong proprietary character and its core can be relatively easily imitated. Such an ease may not be available for potential imitators of innovation. Despite the common organizational platform for quality management and innovation, both processes may involve different technological problems. Therefore, different technological instrumentation, different momentum of triggering the processes and different speed may be required for successful execution of these processes.

Innovation projects have different missions. They have to move the company to a higher technological level. They represent an attempt to create technological leadership on the market and to change the rules of competition. In contracts, quality management is less focused strategically. It is to improve the value of the company's outputs in the most effective and efficient manner. Whether such an improvement creates competitive advantage or changes the rules of competition is not essential for quality management.

Despite their common platform, quality is a more organized, systematic endeavor involving less coincidence than persistent, well designed processes and procedures. Therefore it thrives in rather stabilized organizational systems. Innovation development seems to thrive and proliferate better in more organic, not necessarily stabilized, structures. Contrary to quality management, it quite often involves a coincidence.

Innovation and quality management are targeted at achieving compliance of the company's outputs with its customers' needs. However, quality management is more focused on the existing needs, whereas innovation is very often targeted at even anticipated needs. If viewed in terms of the theory distinguishing between the scope flexibility and changeover flexibility, quality has more impact on the internal environment of the company. Therefore it has to be nurtured internally (at the level of internal processes/procedures) in the case of scope flexibility. Organizational innovation should be emphasized in the case of scope flexibility. In contrast, technological innovation and external

(product-targeted) quality improvements should be the most important considerations in changeover flexibility theory.

NOTES

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