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Process-oriented quality management

Abstract

In this contribution process-oriented quality management, its emphasis and its relevance for educational organisations will be examined. Process-oriented quality management is a generic term for a lot of approaches with a variety of emphasis and range. Therefore, first the relevance of process orientation for a holistic quality management concept will be described. According to the requirements of a holistic quality management the four main quality management concepts (KAIZEN, BPR, Six Sigma, TQM) are analysed by the Integrative Management model. Total Quality Management (TQM) as the most comprehensive holistic approach will be explained more explicitly. The general philosophy and the multitude of facets of TQM will be described. In introducing and realizing the TQM ideas, quality standards and reference models can offer a decisive support. The standards family ISO 9000:2000ff. and the EFQM Excellence Model will be explained as the two most important instruments of introducing a comprehensive quality management system and the TQM idea. Finally, the introduction and the use of the quality management systems in educational organisations will be outlined.

Keywords

Quality Management, Process Orientation, Integrative Management, KAIZEN, Business Process Reengineering (BPR), Six Sigma, Total Quality Management (TQM), ISO 9000:2000ff., EFQM Excellence Model, Quality standards, Reference models

1. Introduction

The objective of this contribution is the description of the need for holistic and process-oriented quality management due to the changes of economies and the analysis how the four main quality management concepts fulfil these requirements. Specifically, the importance of these approaches for educational organizations will be demonstrated. With the enterprises and in the political economies a fundamental change has taken place, which has been intensified since several decades: The new organisation of labour and enterprises, the industrial and technological progress, the globalisation tendencies and the emergence of the IT economy, which is also called the new fourth sector, have led to a loss of significance of the primary and, in the end, of the secondary sector, too (cf. Bruhn 2004, Zink 2004). The tendency towards the tertiary sector and the development of the service branch to the decisive economic power has massively changed the structural challenges to enterprises and organisations as well as their orientations (cf. Bruhn 2004; service is used here in the Anglo-American meaning as a comprehensive generic term which comprises both the product and its development process). With the service offers, customer and quality orientation have more and more come to the fore at the same time. Three central long-term paradigms for successful organisations can be recognized (cf. Bruhn 2004, Ebel 2003, Seghezzi 2003):

1. **Customer orientation:**
   Instead of the seller view and the fixation on products, the customers more and more come to the fore.
2. **Process orientation:**
   Instead of the functions and rigid hierarchies in organisations, overlapping processes become more important.
3. **Quality orientation:**
   Instead of quantity and the mere sales volume, quality becomes more decisive for the customer relationship and the business success.

This requires a comprehensive holistic and integrated management that takes all three paradigms into consideration. For that process-oriented quality management offers a disposition that aims at the long-term sustainable and continuous improvement and optimization of the complete organisation. At first, a general survey of the beginning of the quality idea is given and the concept of the Integrative Management is introduced (chapter 2). Influential quality management concepts are shortly outlined and, with reference to this concept, are examined concerning their range. Total Quality Management (TQM) is more intensely dealt with as the most comprehensive approach for process-oriented quality management (chapter 3). The standards family ISO 9000:2000ff. and the EFQM Excellence Model as the main quality standards and reference models for the introduction and realization of TQM are explained in the following. Finally, some remarks are given how to implement quality management in educational organisations (chapter 4).

2. Quality management and quality development

Quality is of fundamental importance, this is true over all the borderlines of organisations, branches and political economies. Their manifold dimensions lead to different views and definitions of the quality term and to different approaches to quality management. In this chapter, the base of process orientation for a holistic quality management system will be discussed first. Then, by means of a four-dimensional classification of the management, the demands on integrated management concepts are identified. The analysis model of the Integrative Management concept will be presented. This will be the basis for the analysis of the influential quality management approaches in chapter 3.

2.1. Process orientation and holistic quality management

When the economy was still based on solid seller markets, quality was often regarded product-oriented as a given or desired characteristic. Organisations made use of methods of quality assurance in order to guarantee the constant product quality. Through the pressure of stronger competition and with the rise of the customer orientation, new management concepts and faster (re)action times became necessary. The quality of the processes came into the focus of interest. Quality management became a task of the complete organisation and comprises all the employees and processes. After World War II the quality movement gained numerous supporters and chiefly started from Japan (cf. Ebel 2003). Especially with the KAIZEN philosophy the

optimization of products through a comprehensive quality management and customer orientation was pushed ahead. Moreover William Edwards Deming and Joseph M. Juran, who successfully introduced and pleaded their convictions, were influential there (cf. Deming 1982, Juran 1951, Bruhn 2004). Already before that, there had been statistic procedures and methods of supervising and directing processes and of statistical process control (SPC, cf. Seghezzi 2003). Influenced by Deming and Juran a new idea of a comprehensive quality management was developed, which, with the help of the KAIZEN philosophy, also includes a continuous improvement and a systematic model for implementation and realisation in general. In the western countries the philosophy of the Total Quality Management (TQM) was more generally accepted (cf. Zollondz 2002).
After the oil crisis in 1973, a second wave of the Total Quality Management began in Japan (cf. Frehr 1993). This made them more intensely deal with quality management and its introduction. With the development of the standards family ISO 9000ff., in the middle of the eighties, the international discussion and consensus development on the direction and aims of a comprehensive process-oriented quality management began.

Process orientation has stood up to other possible perspectives in quality management as one among some possible views in the meantime. In principle the diverse dimensions of quality can be divided in different ways. A distinction into three basic quality dimensions has become widely accepted. According to Donabedian (1980) and Bruhn (2004) the following three quality dimensions can be distinguished:

1. Potential dimension
2. Process dimension
3. Result dimension

This distinction applies to quality management, too. Next to process-oriented quality management, product-oriented and potential-oriented quality management approaches have been developed. To achieve a comprehensive and holistic concept for organisational management all these three aspects must be considered. The process orientation has gained a crucial role within integrative management meanwhile due to the changes of economies towards customer markets and towards the growing importance of the service sector. The process orientation has frequently replaced the strict organisation structures based on functions. Horizontal business processes crossing all functional units were defined and so afforded the opportunity to a radical change in management. Process reengineering and process optimization became the impulsive forces of economic growth (cf. Ebel 2003, Schmelzer/ Sesselmann 2003).
The four classic management processes of analysis, planning, realisation and controlling can be recovered in process-oriented quality management. Quality management serves to achieve the organisational objectives and to support the management (cf. Bruhn 2004; for another distinction of the management functions in planning, realisation and controlling cf. Juran 1992). Thus a process-oriented standard cycle was introduced analogous to the four management processes. The four phases of the standard cycle of quality management picked up in many variations are:
Plan, **D**o, **C**heck, **A**ct (PDCA, cf. Deming 1982, 1986)

This standard cycle was originally developed by Walter Shewhart, what Deming himself has pointed out (cf. Deming 1986). It has become well known by publications by Williams Edwards Deming and therefore it is often called *Deming Cycle*. The cycle

has especially influenced many Total Quality Management approaches where it can be retrieved in several modified versions.

2.2 Integrative Management

Management in its functional dimension is sub-divided into different layers which are supplied with different structures, aims and functions. To this topic there have already been a lot of different attempts to classification in categories and to structuring (cf. Ulrich 1992, Zink 2004). Integrated management concepts have been developed with quite different aims, emphasis and ranges, and they are subject to changing fashions. Above all they can be characterized by the following qualities (cf. Ebel 2003, Seghezzi 2003):

- Comprehensive and holistic approach
- Expanded management philosophy
- Inclusion of the complete organisation
- Customer, process and quality orientation
- Cycle of continuous improvement

With the four dimensions of the Integrative Management a combination of the concept of the integrated management of the St. Gallen school (cf. Bleicher 1999, Seghezzi 2003) and classical management levels (cf. Bruhn 2004, Ebel 2003) is introduced here.
The base of all management activities is the general management philosophy. In order to achieve comprehensive quality in the sense of business excellence, it has to realize especially a holistic view in regard of its systemic approach, of its orientation on all relevant target groups within the organisation, of its sustainability and of its future orientation (cf. Zink 2004). Out of the management philosophy, the vision of the organisation and its organisational culture are developed which, as paradigmatic principles determine the management (cf. Bleicher 1999, Zink 2004). For the analysis model of the Integrative Management the following four dimensions of the management are distinguished:

Normative Management
The normative management determines the structure of the organisation, the fundamental missions and aims of the organisation and the predominant organisational culture. It results in missions that substantiate the sense and the object of the organisation.

Strategic Management
The strategic management is decisive for the organisational structures, changes the aims into programs and deals with problems respectively with their avoidance in advance. It results in strategic programs that realize the missions.

Tactical Management
The tactical management creates the preconditions for the strategic programs and their direct realization in the organisational units and thus serves as the connection between customer requirements and organisational aims. It results in organisation projects supporting the strategic programs.

Operative Management
The operative management is responsible for the organisational processes, the customer orders and aims at achieving performance and cooperation. It results in concrete orders.

It becomes clear that all the four dimensions are interdependent and influence each other. The rising international competition pressure and the stronger customer power or, system-theoretically respectively economically expressed, the growing environment complexity and dynamics demand (new) management concepts (cf. Luhmann 1998). These concepts need the base of a management philosophy and a long-term vision. They have to focus and comprise in a holistic way all the four dimensions at the same time. In the following the four main quality management approaches are introduced and it is analysed whether they can serve as a comprehensive and holistic quality management concept.

3. Influential quality management approaches

In the following part, influential management approaches are shortly outlined and examined with regard to the question whether they are a comprehensive management concept in the sense of the above described Integrative Management used as analysis model. In addition each concept is shortly examined by its support for educational organisations.

3.1 KAIZEN and CIP

The KAIZEN philosophy aims at optimizing processes and products by a comprehensive quality management and customer orientation. Imai who invented KAIZEN unites process-oriented management with his Japanese concept of innovation in small steps and three levels of KAIZEN (management, groups and persons) (cf. Imai 1986, 1997). In KAIZEN every process is standardized after its improvement before it is released. Insofar his Imai cycle SDCA (Standard, Do, Check, Act) named according to its inventor Masaaki Imai, is different from the Deming cycle PDCA (Plan, Do, Check, Act; cf. chapter 2.1). In the SDCA cycle a continuous optimization in small steps is realised. The standardisation protects the enterprises from surprising setbacks and direct strong falls because standardized processes are less subject to mistakes. This, however, prevents sudden innovations that are possible in the PDCA cycle and it strongly clings to the status quo. KAIZEN thus consequently realises the idea of the continuous improvement process (CIP) which Deming introduced to Japan. The western concept of the continuous improvement process (KVP = Kontinuierlicher Verbesserungsprozess) in Europe and the U.S.A. is not only closely connected with KAIZEN concerning its terms and in many aspects leans on it (cf. Womack et al. 1990) but often both concepts are identified (cf. Schmelzer/ Sesselmann, Zink 2004). It remains to ask whether CIP in its western adoption always implies the comprehensive change of consciousness and attitude as Imai postulates it.
KAIZEN cannot be considered as an integrative management concept because a closed holistic system-oriented approach is not given (cf. Zink 2004): A lot of interesting management approaches are sub-summarized under the umbrella of KAIZEN but a comprehensive and stringent elaboration which would include all forms of control

alternatives (process reengineering) is not given. KAIZEN is an influential management philosophy which focuses the innovation of processes in small steps and the standardisation of processes and which can be an essential part of a comprising integrative management (cf. Imai 1986, 1997, Westerbusch 1998).
Therefore KAIZEN is a good source for review and improvement especially for enterprises like educational organisations dealing with process-oriented services. But it cannot serve as an integrative management concept for the development and realisation of learning offers.

3.2 Business Process Reengineering (BPR)

Business Process Reengineering (BPR) intends the radical restructure and redefinition of business processes. Thus innovative and enormous development and quality leaps can be gained. In their BPM-*Manifesto* which got great resonance both in Europe and in the U.S.A., Hammer and Champy even promise a business revolution in their sub-title (cf. Hammer/ Champy 1994). By delimitating from continuous improvement processes in small steps as in KAIZEN they, however, do not meet the holistic demands of an integrative management (cf. Hammer/ Champy 1994; for its criticism cf. Deming 1986, Feigenbaum 1986, Juran 1992 and Zink 2004; for a broadening of the concepts to a Business Process Management cf. Schmelzer/ Sesselmann 2003). In a certain way BPR can be called the complementary opposite to KAIZEN. So BPR remains a method to radically innovate processes which does not offer a holistic concept for integrative management but which is often a condition for its introduction (cf. Hammer/ Champy 1994, Champy 1995, Zink 2004).
Educational organisations have often the opportunity and the need to a radical change management of their business models due to the uncertain learning market. Therefore BPR can support well the quality management of educational organisations. But BPR is not the compensation for a quality management but helps to improve the adaptation of the learning processes to the customer's needs.

3.3 Six Sigma

In 1996 Six Sigma was conceived by Motorola as an instrument of quality planning, at first for the production field (cf. Harry/ Schroeder 2000, Zink 2004). The name of Six Sigma is derived from the stochastics: The Sigma factor designates the variation (deflection from the nominal value) in a Gauß-distribution in which two of one million parts are outside the range of six Sigma (cf. Seghezzi 2003). “Motorola as the pioneer of Six Sigma, for understandable reasons, has allocated 3.4 parts outside Six Sigma. According to that his model is constructed, too.” (Seghezzi 2003, 266). Six Sigma, according to the definition by Motorola, then means that only 3.4 mistakes occur in one million possibilities and that thus a faultless output of 99.99966 % is achieved. With this result the underlying zero defect philosophy is already near (cf. Crosby 1980). In Six Sigma critical customer related measuring values are defined and the accompanying key processes are determined. Strong improvement aims are set, which are measured and evaluated electronically with the help of a lot of statistic methods. In order to enlarge the customer satisfaction the processes are optimised and the defects

eliminated. Insofar Six Sigma is fundamentally a method of performance measurement and performance improvement which can be applied in every quality management (cf. Schmelzer/ Sesselmann 2003, Zink 2004).
In the meantime Six Sigma has extensively been developed further (cf. Harry/ Schroeder 2000, Seghezzi 2003, Zink 2004). By including systematic project management and permanent participation in improvement projects Six Sigma, together with its strong computer use, is even partly regarded as modern KAIZEN (cf. Seghezzi 2003). By introducing a qualification system with certifications Six Sigma remains a continuous organisation process. In accordance with far-eastern competitive sports the interested supporters of Sigma Six get different belts after passing the examination successfully, beginning with green belts beyond black belts for examined project manager to the black Master Belts for the organisation-internal Six Sigma program manager. In addition to that Six Sigma was extended by further TQM instruments, e. g. by the leadership idea realised by introducing the declaration of champions. Six Sigma cannot be called an integrative management (yet?), but it is justified to speak of a comprehensive management strategy which meanwhile far exceeds the statistic registration of defects (cf. Seghezzi 2003, Zink 2004).
With Six Sigma educational organisations find an interesting approach which development is still in progress. Actually it is not an appropriate quality management system but the enrichments and development of Six Sigma is going in that direction. Educational organisations can use Six Sigma as an instrument for reviewing and redefining their processes obtaining a comprehensive quality management concept. It has the potential to become a holistic approach in future.

3.4 TQM and TQC

Total Quality Management (TQM) reached Japan especially through the two Americans William Edwards Deming and Joseph M. Juran where their philosophy was widely spread and used under the term Total Quality Control (TQC). TQM is a holistic management philosophy that can be characterised as the most comprehensive quality management approach (cf. Seghezzi 2003, Bruhn 2004) and that therefore will be described more extensively in the following.
Both the Americans Deming and Juran represented the idea of TQM first and imported it to Japan. There TQM was absorbed strongly and reached, under the name Total Quality Control (TQC), wide dissemination and realisation (cf. Feigenbaum 1986). The Deming Prize awarded already in 1951 for the first time contributed to this development to a great extent. In Japan TQM was regarded as a comprehensive organisation wide management philosophy and task almost from the beginning (cf. Zollondz 2002). The situation in the U.S.A. and in Europe was quite different first: There process-oriented quality management was regarded predominantly as a task of single organisational business units. Here, too, the establishment of quality prizes caused a broader view. The American Malcolm Baldrige National Quality Award (MBNQA) was adopted by the US-American Congress by law in 1987 and was awarded in 1988 for the first time. Its model delivered practical measurement categories and led to a strong TQM movement in the United States (cf. Seghezzi 2003). In Europe the European Quality Award (EQA) was developed by the European Foundation for Quality Management (EFQM) in cooperation with the European Commission and the European Organization for Quality (EOQ) and awarded in 1992 for first time (cf. Zink

2004). Both prizes, like the Deming Prize, aim at the dissemination of the TQM idea and its realisation.
The main objective of Total Quality Management (TQM) is a continuous improvement process (CIP) that is called KAIZEN in Japan: KAIZEN improves the processes by many little single steps and reduces existing performance failures (cf. chapter 3.1). Beyond that TQM is the organisational management concept dealing with quality as the core focus of all activities and used by all the employees (for comments cf. Schmelzer/ Sesselmann 2003). TQM is an ambitious and holistic organisation philosophy characterised by these five aspects (cf. Seghezzi 2003, Soin 1992):

1. Customer orientation in consideration of all stakeholders
2. Use of all knowledge resources and link to individual and organisational learning
3. Continuous improvement by little as well as by radical steps
4. Quality responsibility by each single person and by all the teams
5. Working in processes

Total Quality Management is not a consistent and coherent quality management approach, but is a combination of a lot of different concepts. The most important impulses and thinkers and their influence will be described shortly in the following part. Deming has emphasised the quality development in processes and its subjective assessment within his "14 Points for Management"-Programme (cf. Deming 1982, 1986, Bruhn 2004). For him quality is not measurable in an objective way, but always the individual result of the customers' measurement concerning value and performance given for the money. In parallel he has introduced the Continuous Improvement Process (CIP) principle which is contained as the fifth point of his "14 Points for Management"-Programme (cf. Deming 1982, 1986, Bruhn 2004, Zollondz 2002).
Juran argues similarly with his customer-oriented quality definition called "Fitness for use" for products and services (cf. Juran 1951, 1992, Bruhn 2004). He has transferred the Pareto-principle to the quality assurance by his concept "vital few, useful many". His quality definition can be used for all kinds of products, for all hierarchical levels, for all organisational functions and for all branches (cf. Juran 1992). Juran has expanded the customer definition by introducing the "internal customer" and also takes into account the internal quality processes within an organisation. His "Quality Triology" consisting of the three processes quality planning, quality control and quality improvement represents a holistic management approach for continuous quality improvement. Statistical methods and measurement are used mainly, whereas the importance of the colleagues seems to be minor (cf. Bruhn 2004, Oess 1993).
Feigenbaum has decisively formed the Japanese vocabulary with his Total Quality Control (TQC) approach. Feigenbaum calls for the integration of all internal organisational interdependencies and for the responsibility of all the employees. He especially focuses on technical quality assurance and introduces the consideration of quality costs. His main objective is the fulfilment of customer expectations and the adaptation of the quality to the customers' requirements and standards (cf. Feigenbaum 1986, Zollondz 2002, Soin 1992).
Crosby has formulated his "Four Absolutes of Quality Management" for a comprehensive quality-oriented organisation culture while he, in the sense of the performance standard of zero defects, postulates "Do it right the first time." Analogue to Deming he has composed a "14-step Quality Improvement Process" for its realisation (cf. Crosby 1980, Bruhn 2004, Zollondz 2002).

Ishikawa has developed the Company Wide Quality Control (CWQC) concept (and also the well-known fishbone diagram). This approach is based upon the concepts of Deming and Juran (cf. Bruhn 2004). He considerably extends the meaning of internal customers (cf. Ishikawa 1985). Ishikawa recommends the integration of all the employees into a participative management concept and proposes the establishment of Quality Circles for the first time (cf. Bruhn 2004, Zink/ Schick 1998).
Within all these developments and different approaches in parallel, a generic movement can be observed from pure quality assurance to process-oriented quality management in the sense of a comprehensive Total Quality Management. Worldwide acceptance and realisation of Total Quality Management was reached and supported strongly by the development of international quality standards and reference models and especially by the development of the standards family ISO 9000ff.

Finally, it can be summarized that TQM is the most holistic quality management concept of the four discussed quality management approaches (KAIZEN, BPR, Six Sigma and TQM). TQM fits best the defined sense of an integrative management concept. Among the other three concepts Six Sigma has shown the best potential for its development. But actually TQM is the most complete integrative management concept fulfilling all requirements. Especially TQM is suitable for educational organisations due to its accentuation of process orientation. Therefore, the main quality standards and reference models of TQM and their relevance for educational organisations are carried out in the following chapter 4.

4. Quality Standards and Reference Models

Process-oriented quality management has won recognition against statistical failure control and product-oriented quality assurance. The holistic focus on quality management processes has made possible an avoidance of mistakes in advance and a strong customer orientation. In this combination Total Quality Management is the most comprehensive approach among many concepts the most influential of which have been outlined in chapter 3 above. In this chapter the relevance of process-oriented quality management for educational organisations will shortly be dealt with. Quality standards and reference models are gaining more and more in importance. Therefore the standards family ISO 9000ff., the reference models of ISO/IEC 19796-1 and PAS 1032-1 (cf. DIN 2004) and the EFQM Excellence Model (cf. EFQM 2003b) will be presented in the following as the most relevant quality standards and reference models for the implementation and realisation of the Total Quality Management philosophy.

4.1 Process orientation and educational organisations

Process-oriented quality management and especially Total Quality Management can raise the service quality just in education and vocational training. The reason for this is that the products and services, i. e. the learning offers, can be examined, assessed and evaluated hardly before their usage. The consumers of learning offers, i. e. the potential learners must trust the information given about the learning offers by the providers. They can try and check a learning offer only very seldom. Especially face-to-face training parts cannot be tested in advance, but also electronic learning resources can be

tested only partly as demo versions, otherwise these learning products would lose their monetary value. On the other hand the examination and certification of every learning offer by external evaluation would be very expensive and not economic. And there is the general problem that the quality of materials and products cannot give a hint about the overall quality of learning offers: The quality of the learning services like individual coaching and tutoring as well as the competencies of the learning provider, the teachers and the tutors cannot be evaluated in advance. Therefore, quality standards can be a valuable aid, especially in organisational education and vocational training. Quality standards do not only offer indications for the quality management of one's own, but also for the comparability of learning offers and for the transparency during their planning, development, realisation and evaluation. They are not a guarantee for excellent quality of products and services but a useful instrument to ensure the organisational process quality on provider's side and an indicator for efficient learning offers on customer's and user's side. In the following part, the standards family ISO 9000:2000ff. and existing reference models (PAS 1032-1/ ISO/IEC 19796-1 and EFQM) will shortly be dealt with because they are most important for the process-oriented quality management. Every chapter will be concluded by some hints how educational organisation could use the specific approach.

4.2 The standards family ISO 9000:2000ff.

The standards family ISO 9000:2000ff. is supporting the development, implementation and improvement of quality management systems. The following model of a process-based quality management system is the base of the standards family ISO 9000:2000ff.:

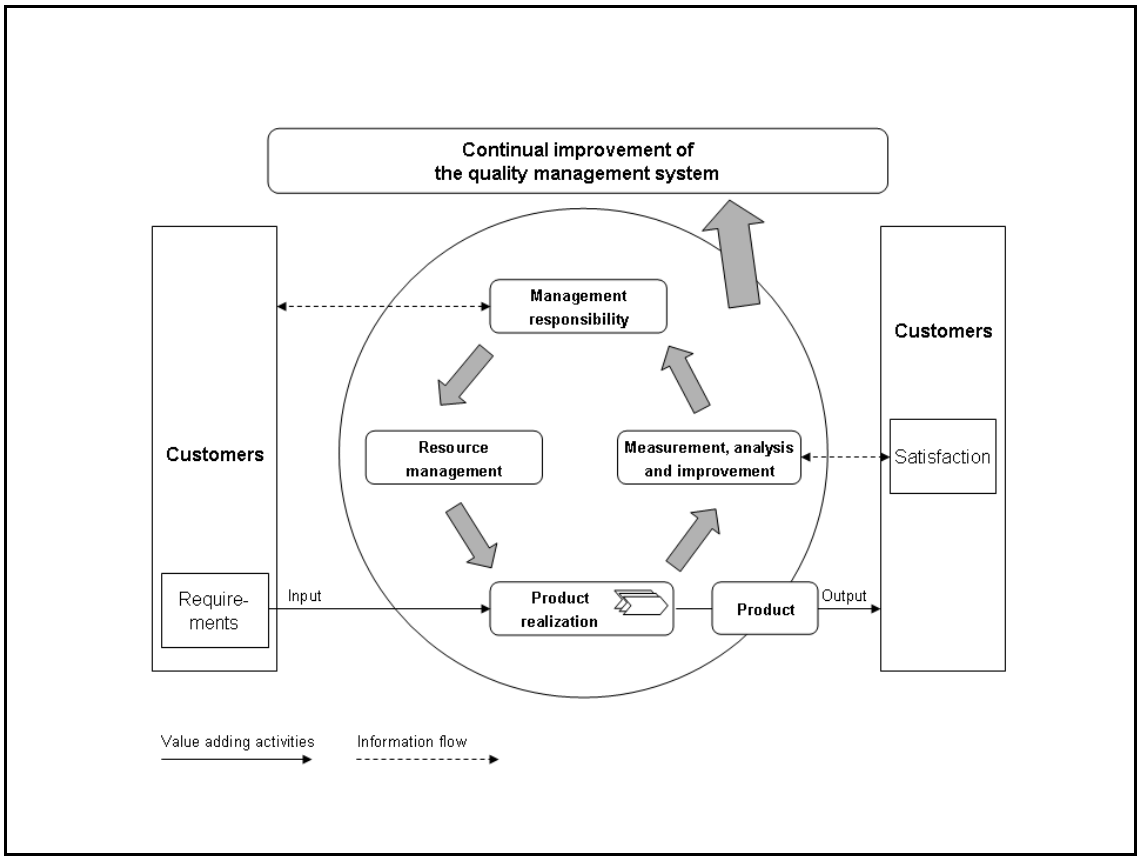

Fig. 1: Model of a process-based quality management system from ISO 9001:2000

The analogy to the PDCA-Cycle is evident and intended. In conjunction with the clear customer orientation and the emphasis of the need for continuous improvement, this model requires a comprehensive quality management system in the sense of a Total Quality Management. The necessary principles are included in ISO 9000:2000 as well as in ISO 9004:2004 (cf. ISO 9000:2000, ISO 9004:2000, DIN 2001). The following eight quality management principles form the basis for the quality management system standards within the standards family ISO 9000:2000ff.:

"Customer focus
Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.

Leadership
Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

Involvement of people
People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit.

Process approach
A desired result is achieved more efficiently when activities and related resources are managed as a process.

System approach to management
Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives.

Continual improvement
Continual improvement of the organization's overall performance should be a permanent objective of the organization.

Factual approach to decision making
Effective decisions are based on the analysis of data and information.

Mutually beneficial supplier relationships
An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value." (ISO 9000:2000-12, 7)

The standards family ISO 9000 has been developed and edited and will be revised and developed further by the ISO Technical Committee 176 "Quality Management and Quality Assurance" (ISO/TC 176). The first edition of the standards series ISO 9000ff. took place in 1987, and already in 1990 it was decided to further develop it in two steps. To assure its consistence and continuity in practical implementation, a first revision with slight changes only was published in 1994. The long-term further development with radical changes was (provisionally) ended in 2000, with the publication of the new series ISO 9000:2000ff. The most important innovations were

formally the consolidation of the formerly more than twenty standards into four main standards with a similar structure and *in substance* the general process orientation.

The standards family ISO 9000:2000ff. consists of these four standards:

- **ISO 9000:2000-12:** ***Quality management systems. Fundamentals and vocabulary***
- **ISO 9001:2000-12:** ***Quality management systems. Requirements***
- **ISO 9004:2000-12:** ***Quality management systems. Guidelines for perfomance improvements***
- **ISO 19011:2002-12:** ***Guidelines for quality and/or environmental management systems auditing***

ISO 9000:2000 defines the fundamentals and the vocabulary of quality management and quality management systems. It contains the eight quality management principles that can also be found in ISO 9004:2000, as well as the model of a process-based quality management system (also contained in ISO 9001:2000 und ISO 9004:2000). ISO 9001:2000 determines the requirements for quality management systems. Core meaning has been given to the overall performance, efficiency and effectiveness of a quality management system to meet and fulfil the customers' needs. ISO 9004:2000 offers a guideline for organisations whose top management aims at a continuous performance improvement. The standard ISO 9004:2000 broadens the objectives of ISO 9001:2000, especially to support the measurement and the improvement of the overall performance, efficiency and effectiveness of an organisation. ISO 19011:2002 has been developed to uniformly supersede the former standards for quality auditing (ISO 10011) and for environmental auditing (ISO 14010ff.) and has been prepared jointly by Technical Committees ISO/TC 176 "Quality management and quality assurance" and ISO/TC 207 "Environmental management". ISO 19011:2002 contains guidance on managing audit programmes and on conducting internal and external audits of quality and environmental management systems as well as the description of the competencies needed by an auditor. It also defines the principles of auditing, with the help of which auditors should gain equal evaluation results (cf. ISO 19011:2002).

Both ISO 9001:2000 and ISO 9004:2000 were formed as a consistent pair with similar structures during the great revision of the standards family 9000:2000ff. ISO 9001:2000 is almost completely included in ISO 9004:2000. "ISO 9001 specifies requirements for a quality management system that can be used for internal application by organizations, or for certification, or for contractual purposes. It focuses on the effectiveness of the quality management system in meeting customer requirements. ISO 9004 gives guidance on a wider range of objectives of a quality management system than does ISO 9001, particularly for the continual improvement of an organization’s overall performance and efficiency, as well as its effectiveness. ISO 9004 is recommended as a guide for organizations whose top management wishes to move beyond the requirements of ISO 9001, in pursuit of continual improvement of performance." (ISO 9001:2000-12, 14) Thus ISO 9004:2000 as well as ISO 9000:2000 are not intended for certification or for contractual purposes. A certification is therefore possible on ISO 9001:2000 only. ISO 9001:2000 can be used also for contractual purposes as well as for internal application by organisations. It is important to note that ISO 9001:2000 does not standardise a quality management system and it does not contain concrete specifications. The standard describes 'only' the requirements on a quality management system and offers support for organisations to develop and establish their own quality

management system that is to fit to the special needs of the organisation (cf. ISO 9001:2000).

The standards family ISO 9000:2000ff. has achieved, together with their eight quality management principles, a great dissemination and over 400.000 enterprises worldwide have been certified until their radical revision in year 2000 (cf. Seghezzi 2003). Process-oriented quality management has considerably won consideration and reputation by the revision and new formulation of the standards family ISO 9000:2000ff. Their implementation and realisation have considerably grown. Just within the service sector, the new standards with their process orientation have contributed to give more place to the ideas of quality management and to establish the philosophy of Total Quality Management.

The standards family ISO 9000:2000ff. can be used efficiently by educational organisations especially after its revision and new given process orientation. The standards support educational organisations by the development and implementation of a holistic quality management system. To implement such a quality management system in educational organisations, the commitment of the top management is necessary for defining the organisational vision and the derived missions. Another crucial factor is the identification of the processes and involved stakeholders and the participation of all employees. The success of the implementation depends on the consciousness, on the attitude and on the support of all people developed and improved by internal communication, workshops and processes.

4.3 Reference Models (ISO/IEC 19796-1 and PAS 1032-1)

Reference process models are well fitting for implementation, analysis, evaluation and reengineering of organisational processes. The new standard ISO/IEC 19796-1 and the specification PAS 1032-1 are the first two reference process models especially developed for the education and vocational training sector with special focus on E-Learning. It is important that the DIN-Reference Process Model included in PAS 1032-1 is a comprehensive process model that covers all aspects and requirements of the providers as well as of the users of learning offers in the same way (cf. DIN 2004). The new standard ISO/IEC 19796-1 based on this model is in addition an internationally accepted quality standard that has acquired its worldwide acceptance by a long-term consensus process. The new standard ISO/IEC 19796-1 and the specification PAS 1032-1 will be described and explained in detail on a different place of this book. That is why here it may be sufficient to mention them and to refer to them (cf. DIN 2004, 2005).

4.4 The EFQM Excellence Model

The organisation European Foundation for Quality Management (EFQM) was founded in 1989 by leading European major enterprises with the support of the European Union. The main objective of EFQM is the dissemination and implementation of the TQM philosophy in Europe (cf. Zink 2004). Therefore the European Quality Award (EQA)

was established following the Japanese Deming Prize and the American Malcom Baldrige National Quality Award. The EQA was awarded in 1992 for the first time. The base of it is the *EFQM Excellence Model* (EFQM 2003b) launched in 1991 for the application of the *Fundamental Concepts of Excellence* (EFQM 2003a). These eight Fundamental Concepts of Excellence of the EFQM are:

"Results Orientation
Excellence is achieving results that delight all the organisation's stakeholders.

Customer Focus
Excellence is creating sustainable customer value.

Leadership and Constancy of Purpose
Excellence is visionary and inspirational leadership, coupled with constancy of purpose.

Management by Processes and Facts
Excellence is managing the organisation through a set of interdependent and interrelated systems, processes and facts.

People Development and Involvement
Excellence is maximising the contribution of employees through their development and involvement.

Continuous Learning, Innovation and Improvement
Excellence is challenging the status quo and effecting change by utilising learning to create innovation and improvement opportunities.

Partnership Development
Excellence is developing and maintaining value-adding partnerships.

Corporate Social Responsibility
Excellence is exceeding the minimum regulatory framework in which the organisation operates and to strive to understand and respond to the expectations of their stakeholders in society." (EFQM 2003a)

The EFQM Excellence Model (EFQM 2003b) is based on nine criteria (five 'enablers' criteria and four 'results' criteria). The following figure shows the relationship between the nine criteria and their weighting at the EQA:

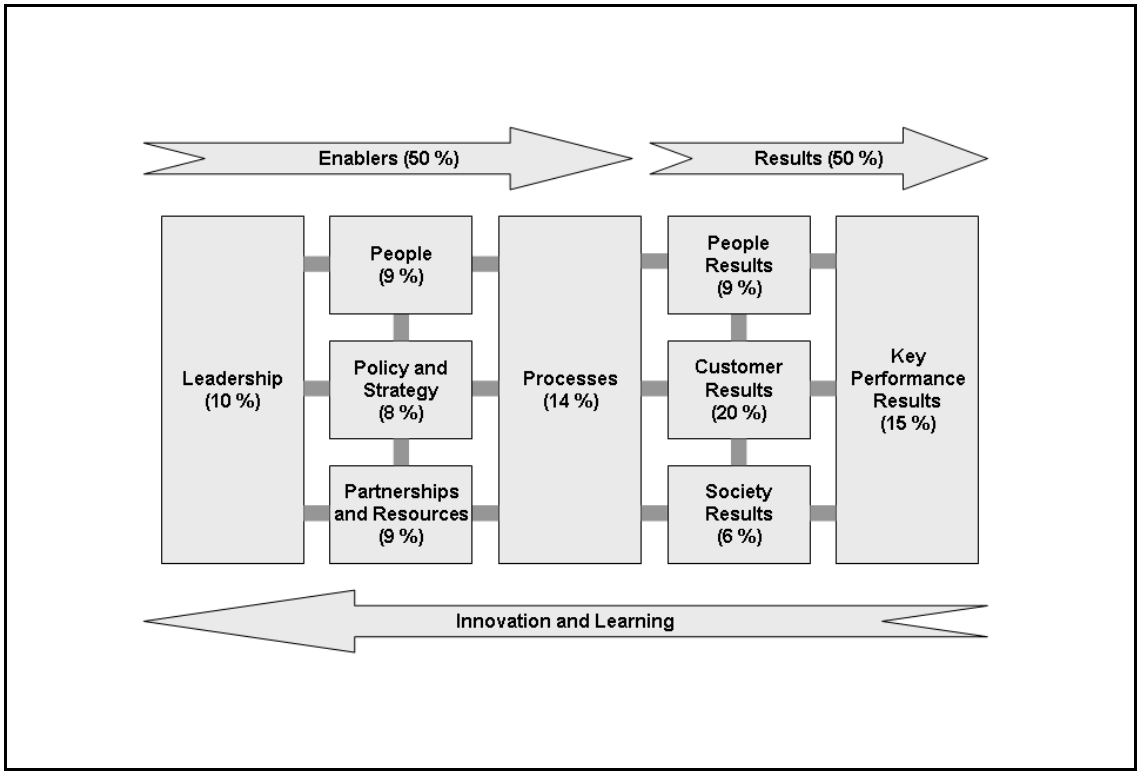

Fig. 2: The EFQM Excellence Model

In 2000 the criteria of the EFQM Excellence Model were revised while for the first time three sub-criteria for customer orientation and the RADAR approach of continuous improvement processes were integrated (cf. Zollondz 2002, Zink 2004). RADAR stands for:
Results, **A**pproach, **D**eployment, **A**ssessment and **R**eview.

The RADAR approach emphasizes the importance of continuous improvement in the sense of the PDCA-Cycle as well as of the focus on achieved results. In addition that underlines that the EFQM Excellence Model is a comprehensive TQM approach. The EFQM Excellence Model especially recommends the self-assessment (in difference to the standard ISO 9001:2000). The EFQM proposes different methods for the self-evaluation (cf. EFQM 2003c, Zink 2004):

1. Self-Assessment by workshop
2. Self-Assessment by matrix diagram
3. Self-Assessment by check list
4. Self-Assessment by standard form
5. Self-Assessment by the simulation of a proposal of a national or international prize
6. Self-Assessment by involvement of colleagues

The EFQM Excellence Model is suitable for educational organisations especially due to its emphasis of the processes' relevance. To introduce the EFQM Excellence Model, first the commitment and support by the top management has to be fetched and a careful planning of the assessment units, of the methods, of the resources and of the task distribution has to be realized. In addition to that especially the information and qualification of all the stakeholders according to their functions and roles within the self-assessment has to be taken notice of in the forefield. During the self-assessment the

data will be collected, documented, prepared and finally assessed. Different methods can be mixed up at the stage of documentation and assessment. It is important to obtain a common consensus at the assessment eventually by external support. The results of such a consensus process must influence the whole organisation and the strategic management. And this influence should not be the ending point of self-assessment but the starting point for the next self-assessment (cf. Zink 2004). In the sense of the RADAR model every result of a self-assessment is only the base for the permanent process cycle to continuous improvement.

5. Summary

Quality management is a concept that has permanently grown up and been improved, and it integrates customer orientation, process orientation and quality orientation. Total Quality Management covers all the requirements of an Integrative Management concept. The revision and further development of the standard family ISO 9000:2000ff. have led to internationally accepted quality standards for the development and implementation of a quality management system and for its certification. Process-oriented quality management can look back on a long-term development that, in the sense of a continuous improvement process cannot be finished, but has always to be evaluated and further developed. For that reason quality will be remaining the complex crucial success factor for the entire management in the future.

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