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MSc Thesis

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Implementation of Quality Management leading to Total Quality Management in small professional companies.
Case study of STOPRO Architects.

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Executive Summary

Companies nowadays operate in rapidly changing and challenging environment that enhances companies' need to adjust their strategies and to maintain the competitive advantage. Such a competitive advantage can be gain through the quality development and continuous improvement that represent the basis of Total Quality Management (TQM). The research deals with the implementation of QM leading to TQM in small professional companies provided with an example of one small professional company STOPRO Architects offering architecture and design oriented services in the Czech Republic.

The objective of the research is to enhance existing knowledge of QM implementation in small professional companies leading to TQM by better understanding the factors contributing to the QM development process. Moreover to reach the stated research objective, one main research question was formed: *What factors influence the implementation of QM leading to TQM in small professional companies?* The main research question was specified be a number of sub questions sequenced in five groups according to their topic orientation and these sub questions help to answer the main research question.

The scientific literature study concerns the literature about TQM, stages in QM development process, change management and finally literature concerning small professional organizations. The purpose of literature review chapter is to create a theoretical framework that serves for data collection and data analysis. The outcomes of TQM and change management literature review are the factors that can be evaluated in each stage of the company's development process. The stages are defined according to the quality management maturity grid (QMMG) developed by P. Crosby. The stages serve as a starting point in evaluating the factors of TQM and change management. For the complete picture about QM development leading to TQM in small professional companies (SPCs), the study of literature about SPCs is included. The purpose of the SPCs literature review is to find the specifics of these companies regarding the QM development leading to TQM and compare it to the case of STOPRO Architects. The case of one company is studied in a long time-period in order to gain the detailed information about the development process and to distinguish the stages in the QM improvement process.

The empirical research is carried out through a case study of STOPRO Architects that is investigated by interviewing top management and employees which represent different positions and experienced the QM development process since the beginning. The gained information is described in the empirical part and ordered

according to the topics defined in theoretical part (stage model of the company, TQM factors and the change management in STOPRO Architects). From the empirical part arose several topics as management commitment in QM development, employee involvement and empowerment, communication, continuous improvement or customer relationships. These topics are further developed in the analysis.

The analysis deals with relationships between investigated factors: TQM factors and indicators; steps, changes, barriers and strategies to overcome the barriers. The relationships are investigated between the chosen factors that came from the empirical part. The process of QM implementation leading to TQM is illustrated on the general outline that consists of the following factors: management motivation and expectations, management commitment, communication, actions taken in order to change quality system, cultural change. These factors were found as the factors that have an influence on QM implementation process leading to TQM in STOPRO Architects that belongs the group of SPCs.

The last chapter of the thesis concerns conclusions, recommendations and discussion. The conclusions are aimed on the comparison of a studied case and the literature about the similar companies (SPCs). The specific factors related to the nature of the business as small and professional are the higher level of autonomy and individualism or the fact that the owner is the manager in the same time and the top management is expert in the field of the business. These factors were also confirmed on the case study of STOPRO Architects. The evidence obtained from case study thus confirms the existing literature about SPCs dealing with QM development process leading to TQM.

Key words: change management, cultural change, employee empowerment, management commitment, quality implementation, small processional companies, stages in QM, total quality management.

Abbreviations

CP	Critical process
CSF	Critical success factor
ISO	International Standard Organization
QM	Quality management / Quality manager
QMMG	Quality management maturity grid
SPC	Small professional company
TQM	Total Quality Management

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1 Introduction

The rapidly changing business environment nowadays enhances companies' need to change or adjust their strategies in order to follow the current trends and to gain the competitive advantage. For the organizations it is necessary to work on continuous improvement by implementing such mechanisms which would ensure the quality development in order to survive in the competitive environment. Small professional companies (SPCs) form part of the market and they are not excluded from the competitive pressure. Small organizations represent large and important group of national economies and they often work as suppliers of large companies, thus the quality level of large companies partially depends on them. The interdependence between the organizations is the reason why small companies should follow the path of quality development and continuous improvement and pursue the trend of large companies. The specific group of small professional companies faces the challenge of continuous improvement that represents the basis of Total Quality Management (TQM) which is nowadays considered to be a significant quality improvement tool and also the subject of the investigation. The research will deal with the implementation of QM leading to TQM in small professional companies provided with an example of one small professional company offering architecture and design oriented services in the Czech Republic.

1.1 Theoretical background

TQM is a customer oriented management system that aspires to continual increase in customer satisfaction and requires that the principles of quality management are applied in all levels of the organization. The total quality approach involves all employees as well as suppliers and customers. TQM represents a business strategy focused on meeting and exceeding customers' needs (Evans, J.R., Dean, J.W, 2003, p. 16). However there are many approaches to TQ, the basic components according to Dean and Evans (2003) are: customer focus, a process orientation, continuous improvement and learning, empowerment and teamwork, management by fact, leadership and strategic planning.

The purpose of quality has been significantly changing in time. Quality awareness began with the large scale manufacturing at the beginning of the 20th century with Frederick W. Taylor's concept of scientific management. The first focus was mainly on inspections of goods whether they are produced correctly, in other

words the attention was paid on independent quality control. Later on, the interest was shifted on quality assurance in form of different statistical and economic analysis tools (Evans, J.R., Dean, J.W, 2003, p. 6). In the second half of 20th century the quality improvement issue got into the centre of attention. The important names, related to quality improvement after World War II, are Deming and Juran who introduced to the Japanese managers and workers statistical quality control concepts (Evans, J.R., Dean, J.W, 2003, p. 7). Both, Deming and Juran, developed several points and steps how to improve quality and founded basis for the modern concept of TQM. The other gurus of modern TQM are Feigenbaum and Crosby. TQM is nowadays an important quality improvement tool that helps to enhance the company's competitiveness. This brief introduction of the quality management development leading to TQ shows that the quality issues become very important for the society and the companies have to pursue this trend to remain competitive.

The research about the implementation of TQM system in the organization requires the definition of stages in the company's quality development process. For the purpose of the research the case study of specific company is used in order to gain the detailed information about the different stages in quality development. The single case allows investigating these stages in depth and identifying the obstacles related to the transition process or the steps taken in order to improve the quality management. The previous description of the historical development of the quality concepts leading to TQM shows different stages that can be found in quality management according to the historical development of the discipline. These stages are: quality inspection, quality control, quality assurance and total quality management stage. Initially there was a focus on reducing errors in the production or services by measurements and statistical tools but soon appeared the need for improvement of all management practices. The implementation of quality principles into the business strategy brought the concept of TQM (Evans, J.R., Dean, J.W, 2003, p. 8). Nevertheless for the purpose of the research the stages will be defined according to Crosby's quality management maturity grid (QMMG) where the level of awareness about the quality issues is critical for development from one stage to another. Crosby's QMMG elaborates on five stages which describe how the company deals with quality management and how mature are the processes or the culture regarding the quality management.

The companies which decide to follow the steps of the quality improvement go through the process of development and thus experience a certain organizational change. According to Salaman and Asch (2003) the organizational changes defined are structural change, process related change and cultural change. The description

of the mentioned organizational changes and their relation to the process of company's development are needed in order to analyse the quality improvement in the organization. The integration of TQM into the business strategy requires gradual changes and these changes can be described in several steps. The process of change within the company can be met with a certain number of difficulties and obstacles which will be also discussed further in the research (Oakland, J.S., 1993, p. 410).

Small professional companies represent a specific group of organizations on the market. Firstly they are determined by the size which can be specified according to Recommendation 2003/361/EC adopted on 6 May 2003 by the Commission of EU. Furthermore according to Ritsema and Broekuis (Harte, H.G., Dale, B.G., 1995b, p. 38) the professional companies provide services in a particular field of work and have the skills to use the knowledge in practice. The professional firms are distinguished for the higher degree of uncertainty, lack of tangibles, professional culture, individualism and autonomy (Harte, H.G., Dale, B.G., 1995b, p. 38). On the other hand TQM is a long-term approach that requires cooperation and commitment of all individuals within the organization. The group of small professional companies is an interesting subject of the research especially because the attention was so far mainly focused on large companies (Yusof, S.M., Aspinwall E., 1999, p. 1). The literature about the professional companies is relatively sparse comparing to the literature dedicated to manufacturing companies (Haywood-Farmer, J., Nollet, J., 1993, p. 5). The purpose is to find the specific changes that are related to TQM implementation into Small professional service companies.

There are a lot of aspects to be considered while describing the process of TQM implementation. For the purpose of the research the above mentioned concepts as TQM approaches, stages in QM and management of change were decided to be investigated in a small professional company in order to understand the whole process of the company's transition from the phase where no attention on QM is paid to TQM stage. Different TQM concepts describe diverse characteristics which are significant for particular stages in QM development process. The transition process from one stage to another is related to the specific organizational change. The relationships between three concepts (TQM characteristics, stage model in QM and change management) will be analysed to gain the knowledge about the development that the small professional company has to come through to achieve TQM stage.

1.2   Case study of STOPRO Architects

For the purpose of the research the example of one small professional service company will be used. The company chosen for a case study is providing services in design and architecture and went through a long process of development in quality and thus will serve as an example of small professional service company dealing with TQM.

The research on such company can bring in-depth insight into the factors influencing TQM implementation in similar organizations. In this point it is necessary to define two above mentioned terms: *factors* and *similar companies.* The term *factors* refers to processes linked to stage model development, steps associated to the change management, obstacles allied to the process of change and finally the basic characteristic of the company as its size and the subject of business activity. The second term tries to define *similar companies* that share basic features as the organizational size and the professional orientation. The group of similar companies could be determined by the number of employees up to 30 and by providing professional services in some specific field of work. The professional company in this case represents such organization that dedicates to the provision of service which is advisory and problem-oriented; disposes of specialized knowledge, uses rather intellectual than physical skills; uses individual judgment and autonomous and independent action (Haywood-Farmer, J., Nollet, J., 1993, p. 6). At the end, the comparison of the theory with the empirical research in the specific company can bring new points of view into investigated topic.

The subject of the research is the company STOPRO and its main division STOPRO Architects that is currently an architectural and design practice focusing on development of projects from private villas to large shopping malls or multipurpose buildings. STOPRO Architects went through several crucial changes since November 1992 when it was established as a limited company STOPRO. At the beginning the company did not pursue the path of quality development but in 2003 several external impulses made the company to change its strategy. The main impulses came from the part of company's clients whose requirements for quality standard were increasing. The company reacted on the new situation on the market by applying for the ISO 9001 certification. The process of adoption of ISO certification was successfully accomplished in 2005. At the same year the management decided to initiate the process of the complete restructurization in order to ensure the continuous improvement. This process of reorganization began after the ISO obtaining in 2005.

The subject of the detailed research will be the company STOPRO particularly the division STOPRO Architects where all the activities related to architectural and design services are held. STOPRO Architects has currently 26 permanent employees and other freelance designers. The company works with other specialized firms as authorized engineers and technicians. The research will be mainly focused on the company itself but there also will be a chapter dedicated to the associated design studios, freelancers and other authorized companies that are company's subcontractors.

1.3   Problem statement

Total quality management is a managerial approach that tries to involve management and employees into continuous quality improvement of goods or services in the organization. The specific group of small professional companies faces the challenge to strengthen its position on the market by enhancing quality.

There are many aspects that have to be taken into consideration while describing the implementation of such a complex system as TQM in small professional company. The TQM approach is achieved after a long process of development where several stages can be defined. While moving from one stage to another the company has to struggle with different obstacles and to learn how to deal with the change.

There are several important issues to be mentioned concerning the small professional companies and the TQM implementation. Firstly the group of small professional service organizations was until now neglected in terms of theory development on TQM implementation (Haywood-Farmer, J., Nollet, J., 1993, p. 5) and most of the research has been done on large companies (Yusof, S.M., Aspinwall E., 1999, p. 1). The second point is related to the specific characteristics that make the professional companies different from other organizations. The differences as for example the higher level of autonomy and individualism have influence on adoption of such systems as TQM (Harte, H.G., Dale, B.G., 1995b, p. 38). The other issue refers to TQM literature fragmentation. In the literature about TQM many concepts, frameworks, critical factors of TQM can be found and the different authors (Juran, Deming, Oakland, Crosby, Saraph, Yusof, etc.) differ in their opinions about the importance of those issues.

1.4 Conceptual Design

1.4.1 Research objective

The main research objective is to identify the factors influencing TQM implementation in small professional companies and thus to enhance the theory by studying the TQM development process, examining the stages in quality management and identifying the changes that have to be accomplished. The aim is to create a theoretical framework based on the findings from the literature about the issues related to TQM implementation in SPC and furthermore apply the theoretical framework on a specific SPC. The theoretical concept of TQM will be compared with the situation in one specific small professional company providing architectural and design related services in the Czech Republic. The development through different stages leading to total quality concept will be examined in the case of STOPRO Architects.

1.4.2 Research framework

The research is composed of four main parts: theoretical review, empirical part (case study), analysis and conclusions.
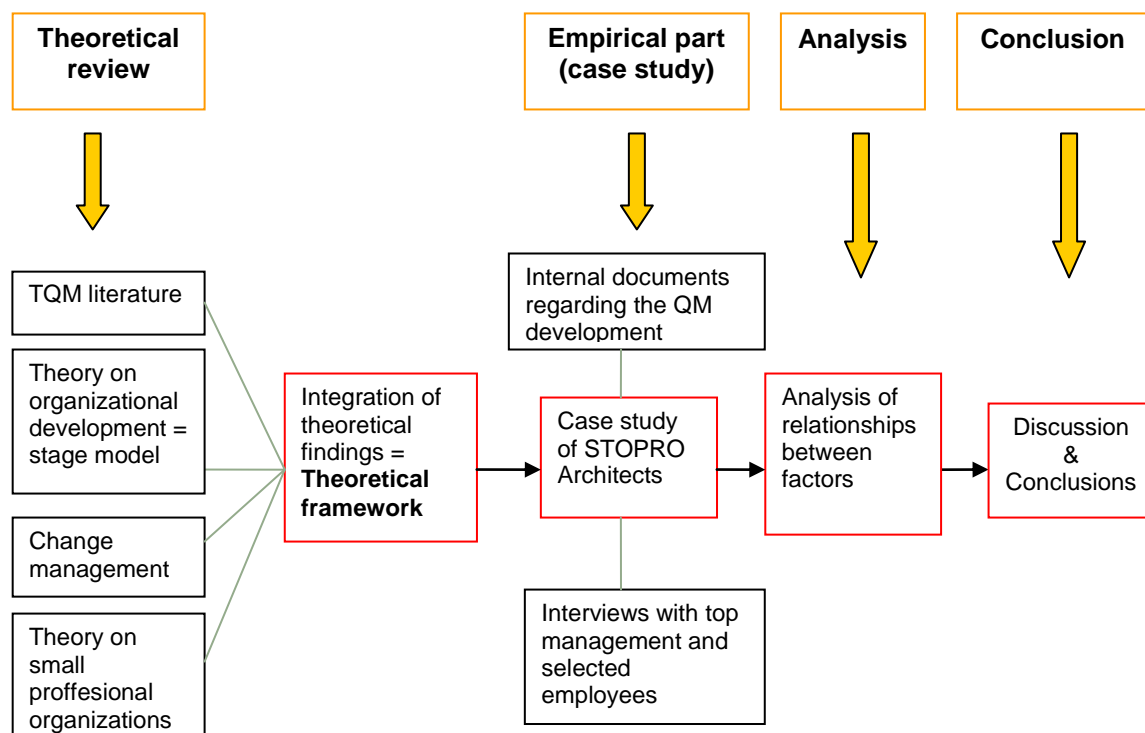
Figure 1-1 Research framework

1.4.3 Research issues

The aim of the chapter is to specify the main research questions according to the objective of the research and develop several sub-questions that help to answer the main research question.

Main research questions:

- What factors influence the implementation of QM leading to TQM in small professional companies?

Sub-questions:

Theoretical

- What are the stages in QM leading to TQM and how can these stages be characterised?
- What are the factors of TQM?
- What are the types of organizational change? What are the steps in the integration of the change? And what are the barriers to change?
- What are the characteristics of SPCs concerning TQM implementation and how they differ from other types of companies?
- How are the above mentioned theories linked together?
    - How do the characteristics of TQM fit to the stage model of QM?
    - Which types of organizational change and what steps occur in different stages of quality improvement process?
    - What are the barriers to change in different stages?

Methodological

- What methodology is used?

Empirical

- What is the historical development of STOPRO Architects concerning the quality management? What stages in QM leading to TQM can be identified in the company?
- Which factors of TQM and to what extent are present in different stages in company's quality development process?
- What were the organizational changes for STOPRO Architects concerning integration of quality issues into the business strategy?

- What were the obstacles in pursuing quality for STOPRO Architects and what were the strategies to overcome the barriers to change?
- What where the steps taken in order to improve the quality and to reach the TQM?
- Are there any differences in the perception of QM implementation process leading to TQM by top management and employees?

Analytical
- Which factors have an effect on QM implementation leading to TQM in STOPRO Architects, and how they effect?
- What are the relationships between factors presented in the empirical part that influence QM implementation leading to TQM in STOPRO Architects?

Conclusive (conclusions, recommendations, discussion)
- What are the findings drawn from analysis of a case study?
- Does the case study of STOPRO Architects confirm the specifics of small professional companies related to QM implementation?
- What can be recommended to the company STOPRO Architects based on the case study research and what can be recommended for the further research?
- Was the chosen research strategy adequate to the investigated topic?

1.4.4 Definition of concepts

QM stage model helps to demonstrate company's development process by describing different stages a company goes through to achieve a TQM stage.

TQM factors are commonly described factors in the TQM literature which can define TQM concept.

Organizational change
Implementation of OM often leads to major changes within an organization and these changes occur in multiple levels of a company.

Small professional companies (SPCs) are determined be the size and by the business focus. According to Ritsema and Broekuis (Harte, H.G., Dale, B.G., 1995b, p. 38) the professional companies provide services in a particular field of work and have the skills to use the knowledge in practice.

1.5 Technical research design

1.5.1 Research strategy

The research strategy can be described as a combination of two strategies. Firstly, the research is focused on a study of the theory related to the TQM implementation. This strategy is according to Doorewaard, H. and Verschuren (2005) called the desk research while all the significant literature is studied. In case of TQM research the topics to be studied in desk research phase are: methodological literature, TQM literature, and literature about the QM stage models, literature about management of change, small and professional companies' literature.

The other part of the work is aimed on empirical research of TQM system in the company. For the purpose of the research, case study was chosen. The case study can give a profound insight into the processes within the object of the research (Doorewaard, H. and Verschuren, 2005, p. 146). In case of the TQM implementation research the case study of one company serves to gain deep insight in the development process where detailed information can be gathered in order to compare it with theory. The purpose of the case study is to generalize theoretical prepositions in the particular field of study. The case of STOPRO Architects will help to describe the process leading to TQM in the company and thus serve to enhance the theory on TQM implementation in small professional companies.

1.5.2 Research material

Study books & scientific articles: methodological literature, TQM literature, literature about management of change and QM stage models, small and professional companies' literature - specific publications are stated in references.

Internal documents from STOPRO Architects: Quality system documentation of STOPRO 29.5.2006, organizational charts of STOPRO.

Internet: website of STOPRO Architects.

Interviews (top management, employees, Quality manager):
The interview with top management of STOPRO Architects specifically with the owner and the CEO will be done in order to identify the different stages of company's quality development process. Further the interview with the representatives of employees to include their point of view into the stage model of quality development. In the second phase the interview will be again with top management and the representatives of employees in order to ask about the TQM factors, changes in the process of QM improvement and barriers related to the change process. Finally the current Quality Manager will provide the detailed information about the quality development process and explain the steps that have been taken within the frame of QM improvement. The detailed description of the interviews will be in the chapter 3.

1.5.3 Research planning

2009	September	Research proposal
	October	Research proposal
	November	Presentation of RP
	December	*Exams in Prague*
2010	January	*Exams in Prague*
	February	Theoretical part
	March	Theoretical part
	April	*Exams in Prague*
	May	*Exams in Prague*
	June	Data collection scheme
	July	Data collection
	August	Data collection
	September	Empirical part
	October	Analysis & Conclusions
	November	Presentation of Final Thesis

Figure 1-2 Research planning
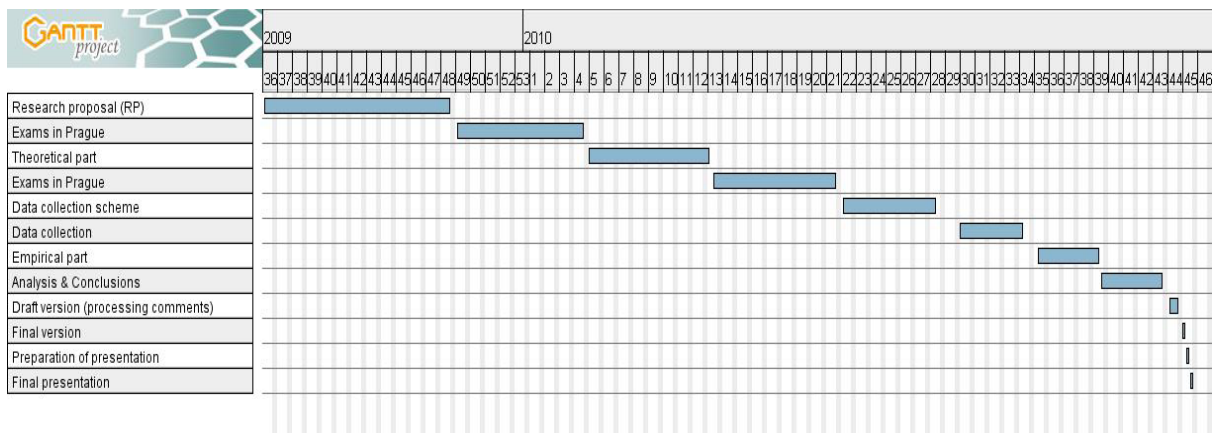
Figure 1-3 Research planning: Gantt chart

2 Theoretical part

The second chapter commences with the general theoretical framework that leads the literature study part of the research. The general theoretical framework shows the variables that are needed for the research to be analysed. The scientific literature study concerns the study of literature on TQM concepts, stage model in QM, theories on management of change and literature on small professional companies in order to give the answers for the theoretical sub questions. The literature overview will give the answers to the following questions:

- What are the stages in QM leading to TQM and how can these stages be characterised?
- What are the factors of TQM?
- What are the types of organizational change? What are the steps in the integration of the change? And what are the barriers to change?
- What are the characteristics of SPCs concerning TQM implementation and how they differ from other types of companies?
- How are the above mentioned theories linked together?
  - How do the characteristics of TQM fit to the stage model of QM?
  - Which types of organizational change and what steps occur in different stages of quality improvement process?
  - What are the barriers to change in different stages?

The study of the scientific literature will serve as input for the empirical research in order to guide the data collection and analysis of the empirical findings. The result of the theoretical part will be the theoretical framework used as a guideline for the data collection and analysis.

2.1   Concept of theoretical framework

The purpose of the general theoretical framework is to clarify the variables of the study and further create the theoretical framework for data collection and data analysis. The research about the implementation of TQM in small professional organization will be supported by the theory on TQM, stages in QM and management of change. Firstly the stages in quality management will be described further the factors of TQM will be identified, and finally the change management theories will be reviewed. Concerning the change management, the process of transition from one stage to another is related to a certain organizational change and in the moment of transition the barriers can be identified. Every company that pursue the path of quality improvement leading to TQM has to follow certain steps in QM development process thus the steps taken in order to improve the quality will be discussed. These are the basic theories to be used for the purpose of the research in order to describe the process of QM implementation leading to TQM. Concerning the fact that the research is focused on small professional companies, also the specifics of small and professional organizations will be discussed in the theoretical review. The characteristics of SPCs regarding the QM improvement will be used for elaboration in the analytical part.

Stages	Factors	Organizational change
1	A	
2	A,B	**Type of change, barriers** and **steps** related to the change
3	A,B,C	
4	B,C,D	
...	A,B,C,D	
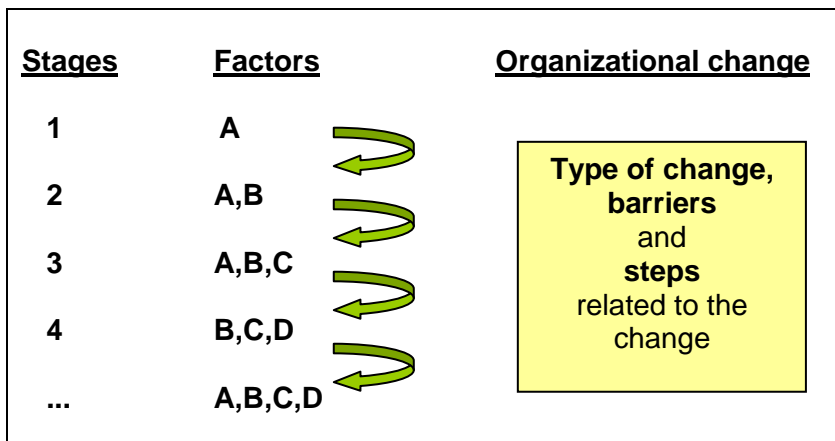
Figure 2-1 General theoretical framework

2.2   Stages in QM

When analysing the TQM implementation it is necessary to identify the stages in QM in order to be able to analyse each stage in detail. For the purpose of the research the Quality Management Maturity Grid (QMMG) was chosen as a starting point in describing the level of company's matureness with respect to quality.

The QMMG is an organizational maturity matrix created by Philip Bayard Crosby in 1979. The matrix was first published in the book Quality is Free (Luning, P.A., Marcelis, 2009, p. 283-285). According to the QMMG is possible to identify the stage in which the company is at the certain moment. It shows how mature are the processes or culture in the company with respect to quality management. Crosby identifies the following five stages: uncertainty, awakening, enlightenment, wisdom and certainty. Each stage is evaluated on the basis of the following six measurement categories: management understanding and attitude, quality organisation status, problem handling, cost of quality as % of sales, quality improvement actions, summation of company quality posture. The whole maturity grid can be seen in appendix 1 (table 1).

The first stage called "uncertainty" is characterised by lack of comprehension of quality as management tool. The prevailing managerial attitude is making responsible of quality problems the department of quality. The quality is hidden in manufacturing or engineering departments and the inspection is probably not part of organisation. In this stage the emphasis is on evaluation and sorting. Problems are solved just in case they occur. Quality improvement actions are not organized because they are not recognized and understood. The result of such attitudes is that nobody in the company understands the cause of the problems.

In the second stage the quality management is already recognized as valuable, but there is still no willingness to spend money and time on it. The emphasis is still on appraisal and sorting and there is no quality department but it is a part of manufacturing or other department. There is no focus on long-term solutions for problems, but there are teams to attack major problems.

The third stage is called "enlightenment" is linked with the recognition and understanding of quality management. Management recognizes the importance of quality improvement and while going through quality improvement process, the management learns about quality. Management becomes to have supportive and helpful attitude towards quality issues. The quality department reports the results to top management. Problems are resolved in an orderly way and faced openly. In this

stage the corrective actions are established and well communicated. The 14-step program (see Crosby's fourteen points in chapter 2.2) is implemented and established. This stage is characterised by identification end resolution of problems by management commitment into the quality improvement process.

The fourth stage of Crosby's quality management maturity grid is about the participation. Management fully recognizes its role within the process of continuous quality improvement. The quality manager is responsible for reporting and for preventive actions. The company is involved with the customer. The problems are identified in advance, early in the development process. There is place for suggestions and improvements in all parts of the organization. In this stage, the 14-step program is continuing and is making certain. The posture typical for this phase is the routine defect prevention.

The fifth stage called "certainty" is the last stage defined by Crosby. The quality management is considered to be an essential part of company system. The quality manager forms part of the board of directors and the activities are mainly focused on prevention. For the last stage is typical that the organization is aware of why they do not have problems with quality. The quality improvement is a normal and continued activity.

The cost of quality is stated between 20% of sales to 2.5% of sales. In practice it means that the organization in the first stage would have the cost of quality up to 20%, the organization in the second stage around 18%, in the third stage 12%, in the fourth stage 8% and finally in the last stage only 2.5% (Luning, P.A., Marcelis, 2009, p. 284).

The last fifth stage means an absolute awareness about the processes within the company and it is possible to denote it as a TQM stage. Crosby does not describe in detail the values that are significant in each stage, but it can be used in combination with characteristics/values presented in TQM suggested by Powell.

The stage model gives the answer to the second theoretical sub question and the description of each stage will be helpful in analysing the company's progress in quality.

2.3 TQM

TQM is frequently discussed topic in business and also by academic. People from business try to find the way how to implement the TQM into the company's strategy and academic try to define what the TQM represents (Bounds, G. et all, 1994, p. 2-3). TQM is a very complex approach and the term TQM does not have a single agreed definition. The reasons for disagreement on TQM definition are related to the nature of the TQM as programme that is in the stage of evolution where new concepts and methods are developed. Furthermore different organizations are in different stages of development process leading to TQM and additionally different organizations require different forms of TQM (Bounds, G. et all, 1994, p. 3). In spite of diverse definitions and disagreements, according to Bounds, G. et all (1994, p. 4), TQM should not be a separate area but it should be a way of life.

The aim of this chapter is to introduce several concepts of QM that have been presented in the past in order to have a deeper insight into the topic of the investigation. The main focus will be on quality management gurus as W. Edwards Deming, Joseph Juran, and Philip Crosby. Each of these pioneers developed several points or steps in quality improvement that form the basis of TQM as it is understood nowadays. The result of this chapter is to identify key characteristics or values of TQM.

Diverse TQM frameworks have been developed by different authors. One of the early pioneers who popularized quality control in Japan in the early 1950s was Edwards Deming. His overall focus was on improvement of the process, rather than focus on the worker. Deming's universal fourteen points for management are as follows (Ross, J.E., 1994, p. 4):

1. Create a consistency of purpose with plan.
2. Adopt the new philosophy of quality.
3. Cease dependence on mass inspection.
4. End the practice of choosing suppliers based solely on price.
5. Constant improves of the system.
6. Adopt modern methods of training on the job.
7. Focus on quality, not quantity.
8. Drive out fear that the employees work more efficiently.
9. Break down barriers between departments.

10. Stop requesting improved productivity without providing methods to achieve it.
11. Eliminate work standards that prescribe numerical quotas.
12. Remove barriers to pride of workmanship.
13. Institute a vigorous education and training.
14. Create a structure in top management that will control the everyday proceeding of the thirteen points (Ross, J.E., 1994, p. 5).

Other author that dealt with quality concepts was Joseph Juran. He developed the three managerial dimensions also called "Juran's trilogy". The trilogy consists of quality planning, quality control and quality improvement. Juran defines quality as "fitness for use" and it means that the concept of quality is from the point of view of the customer (Ross, J.E., 1994, p. 5).

The previous two mentioned authors stress the importance of statistical control, on the other hand Philip Crosby points out the importance of motivation and planning. Crosby stresses that the costs of prevention will be always lower than costs of detection, correction and failure. Like the previous authors also Crosby developed several points (Ross, J.E., 1994, p. 6):

1. Management commitment
2. Quality improvement team
3. Quality measurement
4. Cost of quality
5. Quality awareness
6. Corrective action
7. Zero defects planning
8. Training
9. Zero defects day
10. Goal setting
11. Error cause removal
12. Recognition
13. Quality councils
14. Do it over again (Ross, J.E., 1994, p. 6-7).

The three mentioned experts on quality developed different steps in quality management. When analysing the points, several common topics arise. All three "gurus" mentioned in different forms the importance of inspection, involvement of top management and leadership, long-term commitment, training, quality awareness (Ross, J.E., 1994, p. 8). Furthermore Juran mentioned the term "fitness for use" where declared the focus on customer which is nowadays considered as a basic of TQM. From that principles the TQM developed as a managerial view that endeavour to create a customer focused culture which is supported by the activities aimed at reaching quality related goals (Luning, P.A., Marcelis, 2009, p. 283-285).

The core principles and values of TQM are also expressed in Malcolm Baldrige Award criteria. The criteria combine experiences from the private sector and the federal government (Haksever, C, 1996, p. 35). These criteria are compared to the European Quality Award in the following figure 2.2.

Malcolm Baldrige National Quality Award	European Quality Award
Customer-driven quality	Results orientation
Leadership	Customer focus
Continuous improvement and learning	Leadership and consistency of purpose
Valuing employees	Management by processes and facts
Fast response	People development and involvement
Design quality and prevention	Partnership development
Long-range view of the future	Public responsibility
Management by fact	
Partnership development	
Public responsibility and citizenship	
Results focus	

Figure 2-2 Malcolm Baldrige National Award and European Quality Award[1]

Comparing the U.S. and the European quality awards, in both schemes are mentioned: customer focus, leadership, management by fact, public responsibility, partnership development, result focus, employees' involvement, continuous learning which can be considered as critical in TQM philosophy. These main topics tie up the topics stated by quality management gurus specifically topics related to involvement of top management and leadership, long-term commitment and training.

As seen from the previous description, there are different perspectives how to define the TQM thus the single definition of TQM is not agreed. There are several authors that, based on literature review, came with the factors of QM. The example of such a study can by Saraph *et al.* (1989) that identified in their study the organizational requirements (prescriptions) for effective quality management by grouping together similar requirements that led into eight separate categories. Each of the categories complies with the factors mentioned by quality gurus. For each of the eight factors were developed 78 measurement items (Kian, H. A., 1998). The eight critical factors are the followings:

1. Management leadership and quality policy
2. Role of the quality department

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[1] Hellsten, U., Klefsjo, B.: 2000. TQM as a management system consisting of values, techniques and tools. In. *The TQM Magazine.* Volume 12, number 4, p. 240.

3. Employee relations
4. Quality data and reporting
5. Process management
6. Supplier quality management
7. Product/service design
8. Training

Powell (1995) was another author that made an overview of the TQM literature and developed 12 points that complete TQM programs. After an exhaustive review and integration of the TQM literature suggests that complete TQM programs consist of the following factors (Powell, 1995, p. 17):

1. Committed leadership
2. Adoption and communication of TQM
3. Closer customer relationships
4. Closer supplier relationships
5. Benchmarking
6. Increased training:
7. Open organization
8. Employee empowerment
9. Zero-defects mentality
10. Flexible manufacturing (applicable only to manufacturers)
11. Process improvement
12. Measurement: (Powell, T.C., 1995, p. 19).

According to Yusof and Aspinwall (1999) there are several critical success factors (CSFs) of TQM common for SMEs. The suggested factors are management leadership, commitment and support; supplier quality management; employee relations, human resource management; training and education (Yusof, S.M., Aspinwall E., 1999, p. 806).

From the literature review is apparent that concept of TQM is widely investigated in the scientific literature and several approaches were developed in order to define TQM concept. While comparing Powell's twelve factors, Saraph et al. (1989) and Yusov, Aspinwall (1999) with the topics mentioned by the quality gurus (Crosby, Deming, Juran) and Quality Awards, the same topics as customer focus, leadership, partnership development, result focus, employees' involvement are recognized.

For the purpose of the research will be used the combination of TQM factors suggested by Powell (1995), critical QM factors assessed by Saraph et al. and other authors mentioned in the previous overview. From Powell's twelve factors is excluded the point about the flexible manufacturing which is relevant only for manufacturing organizations thus not meaningful for professional service companies. The factors from Yusov and Aspinwall are included all because these factors are meaningful for the group of small and medium sized enterprises and that will align with the studied case. The different factors will be further used for the research and analysed in particular stages in development process in the context of the case study of STOPRO Architects. The nine chosen factors are:

1. **Committed leadership/ top management commitment and involvement**: long-term commitment by top managers to the philosophy, usually under a name like Total Quality Management, Continuous Improvement, or Quality Improvement. Participation by top management in quality improvement efforts, specificity of quality goals by top management and comprehensive quality planning by top management.

2. **Employee commitment and involvement**: increased employee involvement in design and planning, and greater autonomy in decision-making.

3. **Adoption and communication of TQM**: using tools like the mission statement/vision.

4. **Closer customer relationships/ customer focus**: determining customers' (both inside and outside the firm) requirements, then meeting those requirements no matter what it takes.

5. **Closer supplier relationships**: working closely and cooperatively with suppliers, ensuring they provide inputs that conform to customers' end-use requirements, purchasing policy emphasizing quality rather than prices, supplier quality control.

6. **Benchmarking**: researching and observing best competitive practices.

7. **Training and education**: usually includes TQM principles and quality-related training for all employees, team skills, and problem-solving, statistical training.

8. **Open organization** lean staff, empowered work teams, open horizontal communications, and a relaxation of traditional hierarchy.

9. **Measurement and continuous improvement**: constant performance measurement and analysis of customer feedback.

The nine factors were chosen in order to cover the factors that would be meaningful for SPCs that is why some factors mentioned in the review were excluded (flexible manufacturing) and others were taken from different authors.

2.4 Management of change

Management of change or change management is closely related to the process of development which is in this case the process of quality management improvement. This chapter will answer the sub questions concerning the types of organizational change and the steps in the integration of change into the corporate strategy.

Salaman and Asch (2003) defined three types of organizational changes: structural change, process related change and cultural change. The structural change provoked by the internal initiative as implementation of TQM system requires the redefinition of the relationship between units or workers. Processes refer to the activities that are held within the company through its departments and also across its boundaries. The action of changing processes in an organization is called business process re-engineering. Cultural change focuses on employees and their attitudes and its aim is to change the way that employees think about their work. These are the organizational changes that have to be taken into consideration during the TQM implementation.

The organizational changes can provoke a negative perception by e.g. employees and it would mean an obstacle for the future quality development of the organization. TQM implementation can be seen as not necessary, formalistic, bureaucratic, rigid, impersonal or time consuming. Such a perception of TQM can lead to the resistance to change and it can represent a barrier to the TQM implementation. Most frequently affected by the resistance is the middle management. The tools how to deal with the resistance are education, communication, participation and involvement, facilitation and support, negotiation and agreement (Oakland, J.S., 1993, p. 409).

The barriers to change can be caused by the organization or by the individuals. Organizational barriers to change are: structural inertia, existing power structures, and resistance from work groups or failure of previous change initiatives. Individual barriers to change are: tradition and set ways, loyalty to existing relationships, failure to accept the need for change, insecurity, preference for the existing arrangements, break up of work groups, different person ambitions, fear of (loss of power, loss of skills, loss of income, the unknown), redundancy, inability to perform as well in the new situation.[2]

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[2] http://tutor2u.net/business/strategy/change-management-resistance-barriers.html

The approach chosen to be able to accomplish the successful change is, according to Oakland (1993), a planned approach dealing with the gradual change. First step is to convince a senior management to support the idea of organizational change (Oakland, J.S., 1993, p. 410). Integration of TQM into the strategy of the organization has to be linked to commitment, communication, and cultural change. The timing is critical in a process introduction of total quality. Oakland (1993) mentions seven steps of integrating TQM into the business strategy.

The first step about gaining commitment to change through the organization is related to the senior executives who are responsible for mobilizing the company to change. In this stage is important to create the top team to work on the change (Oakland, J.S., 1993, p. 411).

In the second step the company is developing a shared "mission" or vision related to the change. This step can be realized when the change required is already analysed and the top team is committed. The results of the mission and vision statement are the answers for the common questions as "What are we here for?" and "What is our basic purpose?" and thus enable to define the boundaries of the business. The mission statement has to be documented, understandable, communicable usable and agreed be top management (Oakland, J.S., 1993, p. 411).

The third step is characterized by defining the measurable objectives. These objectives have to be agreed by the top team and become the indicator of success of the mission. The mission is in this step translated into the specific targets (Oakland, J.S., 1993, p. 414).

The fourth stage concerns of development of the mission into its critical success factors (CSFs). The CSFs serve as the minimum key factors that the organization need to have to achieve the mission. The CSFs should be based on tactical and strategic issues that are well balanced. Some examples of such factors can be the need for motivated and skilled people, need for new business opportunities or the necessity for being the best in the field of the business (Oakland, J.S., 1993, p. 414-415).

In the fifth stage the CSFs are broken down into the critical processes. The critical processes describe what is necessary to be done in the organization in order to meet its CSFs. For each CSF to be accomplished, the key process has to be identified. The outcome is the creation of most critical processes which have a priority during the improvement process (Oakland, J.S., 1993, p. 415).

The sixth step deal with the definition of sub-processes, activities and tasks. The breakdown from mission through critical factors and critical processes to

activities and tasks requires the establishment of teams. The teams deal with the activities and later on the individuals performs the tasks (Oakland, J.S., 1993, p. 416).

That last seventh step deals with the monitoring and adjustment of process alignment in order to prevent the difficulties in change process. The company needs to learn how to monitor and modify the new behaviour in order to follow the changing environment (Oakland, J.S., 1993, p. 419).

The process improvement is related to the change management and one of the methodologist who dealt with process improvement was Deming. He developed a continuous improvement cycle which consists of four stages: plan, do, study/check, act (Evans, J.R., Lindsay, W.M, 2005, p. 636). Oakland in his book about TQM (1993) incorporates the organizational change into the continuous improvement cycle of Deming and describes different stages. The first action called "plan" requires the definition of goals, targets, strategy. The second stage called "do" is related to most critical processes and sub-processes. Third stage is about the measurement tools and the last stage deals with corrective actions. There are also defined the danger gaps between the stages which represent the barriers to change in this case. The danger gap between plan and do phase is about the goals without methods. The danger gap between do and check stage is the danger of bureaucracy and no measurement. The danger in the transition time between check and act are the information constipation because of too much data. At the end the last danger could be that the improvement process is not fully implemented thus the cycle cannot work again.

Another perspective on the organizational change made Kurt Lewin. He clarifies the process which leads to a successful change. His three stages process consists of unfreeze – change – refreeze stage (Weick, K.E., Quinn R.E.: 1999, Organizational Change and Development, p.363). In the first stage of unfreezing the company faces the challenge of a potential change. The different state is desired thus it is needed to destabilize the equilibrium and prepare the environment for a change. In the second phase the behaviour are modified and new approaches are developed and adapted. The last stage called "refreezing" represents the state of the company when new behaviours which where adapted in the previous stage will be institutionalized. The facility of the process of change depends also on the size of the company. It is supposed that small companies are more likely to accept the change and thus the first unfreeze phase is easier for them mostly because of the lack of highly formalized structure. On the other hand large companies are better performing in the last phase where the changes have to be institutionalized because of the more formalized structure (Ford, M.W.: 2009, Size, structure and change implementation).

The Lewin's concept of three stage process for successful change supports the previously described seven steps change process. While the seven steps process describes in detail the types of organizational changes in different stages and the specific actions related to them, the Lewin's model shows the organizational change from the higher perspective. According to Lewin's model the seven steps represents the change phase.

The change management overview gives the answer for the third sub question and the analysis of steps and barriers related to change management will be used as a guideline for the empirical research.
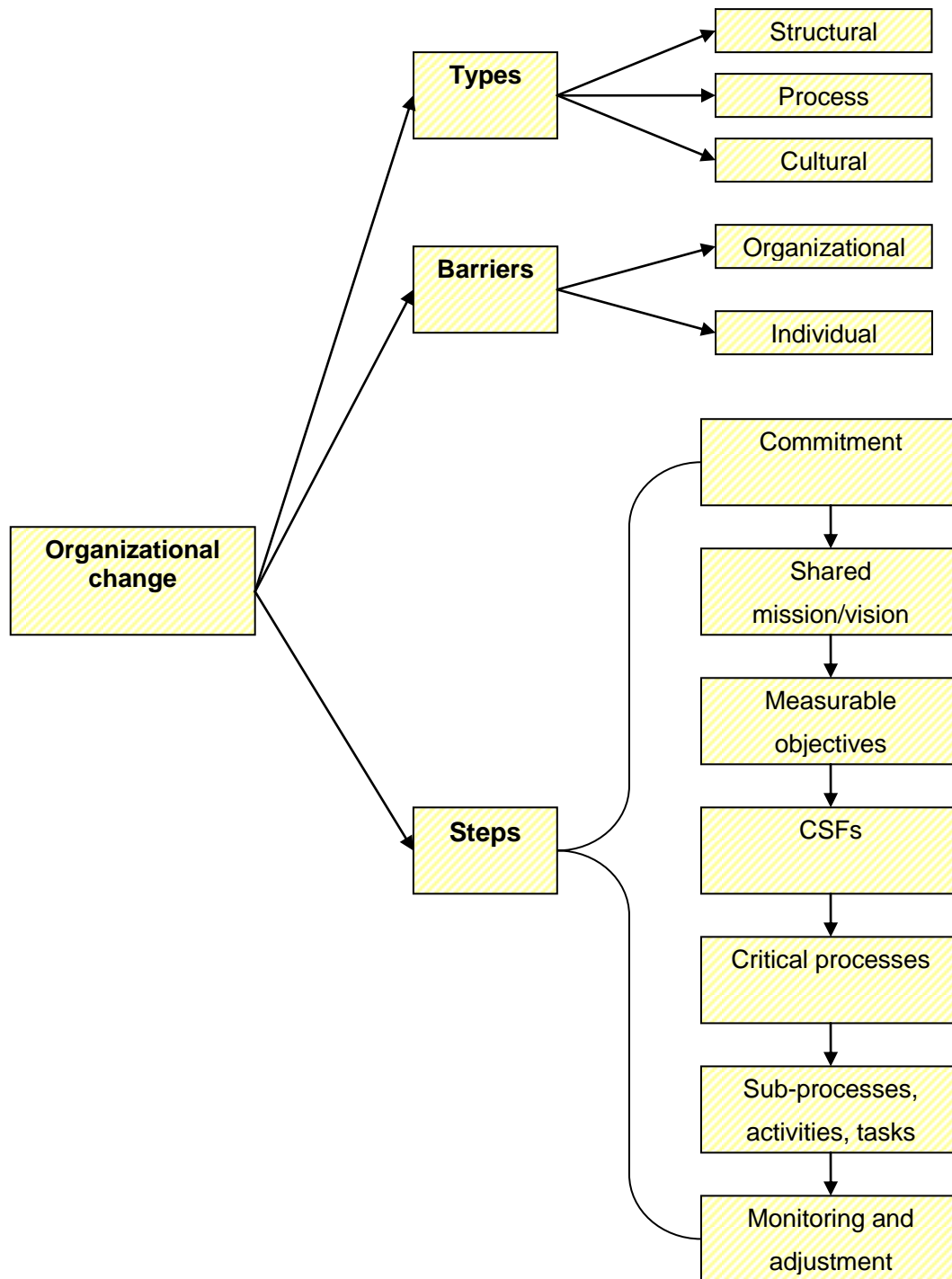
Figure 2-3 Tree diagram of "Organizational change"

2.5 Small professional companies

Small professional companies represent specific group of organizations that are determined firstly by the size which can be specified according to Recommendation 2003/361/EC adopted on 6 May 2003 by the Commission of EU. The Recommendation describes small businesses concerning the headcount, turnover or balance of sheet which is supposed to be less than 50 employees and less than 10 million Euros of turnover or total balance sheet. Furthermore according to Ritsema and Broekuis (Harte, H.G., Dale, B.G., 1995b, p. 38) the professional companies are competent to provide services in some particular field of work or knowledge and have the skills to use the knowledge in practice.

The professional firms are noted for the higher degree of uncertainty, lack of tangibles, with qualitative rather than quantitative criteria for customer satisfaction measurement, professional culture, high buyer-interaction levels, individualism and autonomy, adherence to the standards regarded to the profession (Harte, H.G., Dale, B.G., 1995b, p. 38 and Haywood-Farmer, J., Nollet, J., 1993, p. 6). These characteristics lead to specific problems the professional companies need to deal with. the reason for the potential problems can be caused by the unwillingness of professionals to accept advices from people outside of her or his area of expertise (Haywood-Farmer, J., Nollet, J., 1993, p. 8).

The culture in professional organizations is characterized by individualism and autonomy, and strong professional identity. These aspects that characterize the professional culture lead to strong personal work distributions and high personal responsibility for the work (Harte, H.G., Dale, B.G., 1995c, p. 34). The professionals require few regulations and minimum of administrative work. The conflict between a professional's nature or identity and their organization's culture can cause a major problem (Harte, H.G., Dale, B.G., 1995c, p. 34). To overcome the problems it is suggested to develop a suitable quality management system and to implement an organizational strategy based on organizational and professional needs (Harte, H.G., Dale, B.G., 1995c, p. 35). Haywood-Farmer and J., Nollet, J. (1993) explains that ones the top management receives a positive feedback from the clients their acceptance of TQM rises and consequently the shift of power is enabled in the company from the partners to the clients and to the employees.

Furthermore according to Haywood-Farmer and J., Nollet, J. (1993) in professional companies the concept of quality is more likely to be seen from the

technical point of view and issues as timing or way of presenting results is not considered as important as technical requirements.

The small companies differ in several areas from the large companies: a) ownership, management, organizational structure, b) capital and resources, c) objective, d) markets and customers. Concerning the ownership, most of the small businesses are privately owned and the owner is usually the manager at the same time. Usually owner is expert in the field of the business but does not have education in how to manage the business. The small company tends to have a very simple structure where employees perform several tasks (Haksever, C., 1996, p. 33).

The small companies have some advantages and also disadvantages in TQM implementation. One of the main focuses in TQM is the customer orientation and in this field small companies can have advantage. In the small company there is more likely the face to face contact with the customer comparing to large companies that are more formalized (Haksever, C., 1996, p. 36).

In the literature the topic of the cultural change in the small and large companies is discussed. There is a study that compares both company types according to the ability to overcome the cultural change. The small companies tend to deal with cultural change more easily in order to their more flexible structure. On the other hand, large companies are more formalized and the culture is rooted in the organization in such a way that it becomes more difficult to change it. Furthermore the small companies are likely to be closer to the requirements of the TQM environment in areas as market focus, proximity of individuals and corporate goals, the extent of the functional integration, employees' awareness, and team spirit (Gallear, D.N., Ghobadian, A., 1995, p. 103-104).

The description in this chapter about the small professional companies shows that the analysed type of the company is determined by two factors, its size and the professional orientation. The both characteristics bring several specific issues that have to be considered while analysing this type of the company. The first factor mentioned, the size of the company, can have the influence on the company's ability to deal with the potential organizational change. While analysing the change management in the specific company the attention will be paid on the facility of change acceptance through the whole company. The small professional companies sometimes lack the knowledge in managing the business due to the fact that in small companies are usually lead by the owner who can be specialized in the subject of the business but does not have a managerial background. The professional are characterized by individualism and autonomy, and strong professional identity the on

the other hand can provoke the resistance to TQM implementation. These aspects of the SPCs will be compared to the findings from case study of STOPRO Architects.

2.6   Discussion and conclusions of theoretical part

The theoretical part reviews the theories about TQM, stages in QM, management of change and small professional companies that were chosen with the purpose to do the research about the implementation of TQM in small professional companies.

The TQM factors identified in the first part of the theoretical review were based on several approaches of QM leading to TQM that were developed over time. The findings of the quality "gurus" (E. Deming, J. Juran, P. Crosby) were compared to the findings of authors that inquired into quality management and TQM. The authors compared in the theoretical part are Saraph *et al.* (1989), Powell (1995), Yusof and Aspinwall (1999). During the literature study of TQM factors from different authors some shared values were found while comparing the different resources. In the literature does not exist the only one definition of TQM but there are several approaches that are close to the TQM.   Factors resulting from the TQM literature review that will be used as a part of theoretical framework for the case study are:

1. Committed leadership/ top management commitment and involvement
2. Employee commitment and involvement
3. Adoption and communication of TQM
4. Closer customer relationships/ customer focus
5. Closer supplier relationships
6. Benchmarking
7. Training and education
8. Open organization
9. Measurement and continuous improvement

The Stage model developed by P. Crosby identifies the following five stages: uncertainty, awakening, enlightenment, wisdom and certainty. Each stage is elaborated on the basis of different aspects as management understanding and attitude, quality organisation status, problem handling, cost of quality as % of sales, quality improvement actions. The measurement categories from Crosby will serve to identify the stages in quality development within the company of STOPRO Architects.

The change management literature overview disclosed the types of the change, barriers to change and the steps related to the organizational change. The steps go through mission statement, identification of critical success factors, critical processes, sub-processes to identification of particular activities and related tasks.

The Stage model of Crosby will serve to identify the stages in quality improvement process leading to TQM. Ones the stages are detected, the factors of TQM will be assigned to the particular stages. Finally the changes that occurred are investigated in detail with a focus on steps and barriers to change (seen in figure 2.4).
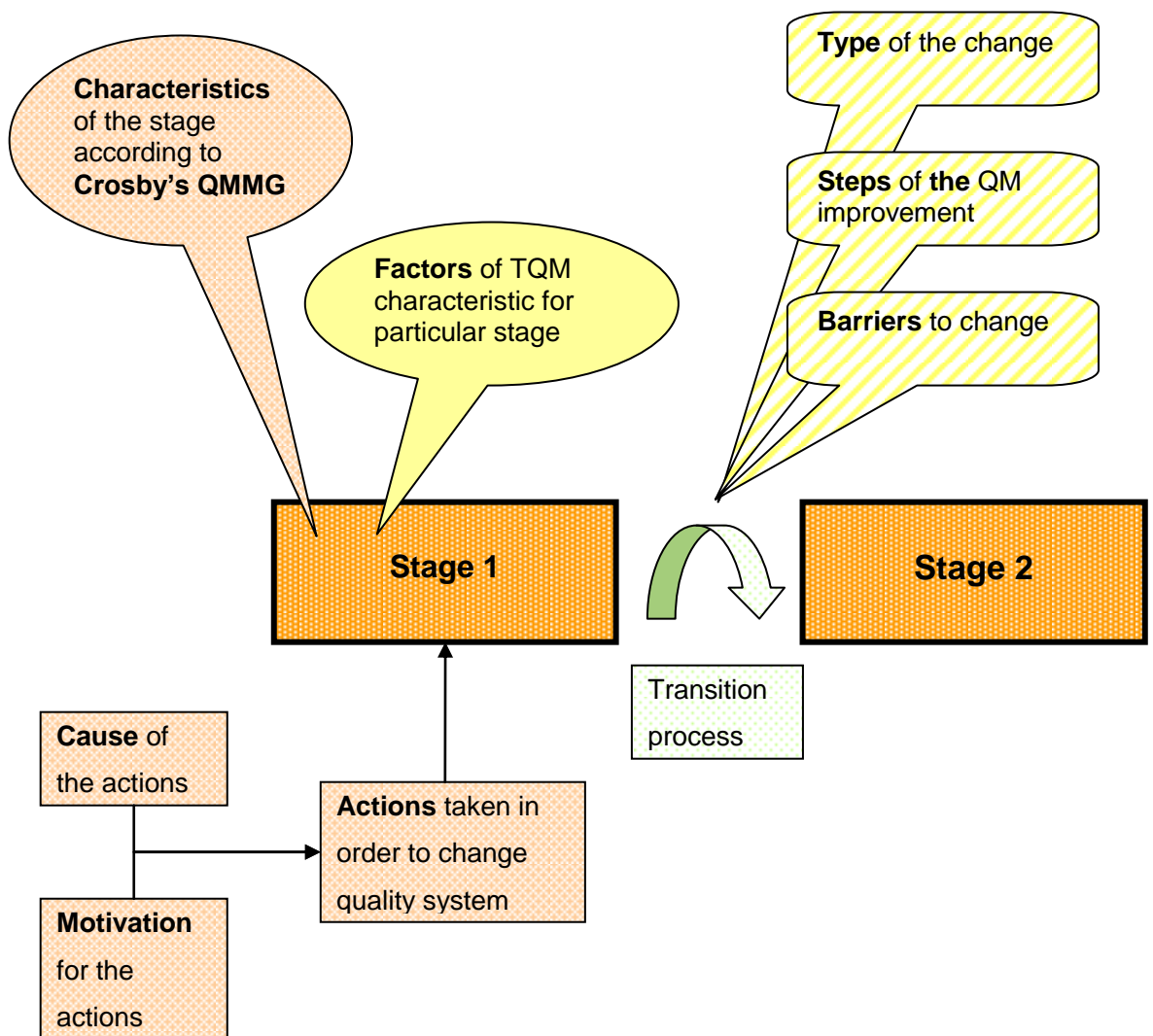
Figure 2-4 Theoretical framework

3   Case study design

The third chapter explains the methodological sub question dealing with the research strategy. The case study is a research strategy which helps to understand the dynamics of particular settings. Primarily two types of case studies are defined: single case study and the comparative case study. Case studies combine different data collection techniques as: interviews, questionnaires, study of documents, and observations. The analysis of a case study can merge numerous levels of analysis. The results drawn from the case study research may be qualitative, or quantitative. The purpose of this chapter is to explain the chosen case study strategy in context to the aim of the work.

The topic about the implementation QM leading to TQM is provided with one example of small professional company that went through a long process of quality development. The single case was chosen for the research in order to analyse the case in the course of time and thus obtain the detailed information about the quality development process. This particular research of STOPRO Architects will give detailed information about the process of quality development in different stages leading to TQM within the context of small professional company. The topics defined in the theoretical part as TQM factors, change management, barriers to change, steps in process of change will be studied in different stages that will be defined on the basis of Crosby's QMMG. The research strategy consists of primary and secondary research. The techniques used for gathering the information are mainly the interviews and study of internal documents.

3.1   Data collection techniques

The data collection will consist mainly of interviews and study of internal documents. Interview is an important source of information in case study research and will be used with the intention of gaining the qualitative data regarding the stages in QM, the presence of TQM factors in each stage, barriers to change and the steps in QM development.

The interviews will be held in two phases. The first phase will be done in order to identify the stages in quality development process in STOPRO Architects. In the first phase two groups of people will be interviewed: the top management and the representatives of employees. The selection of two groups to be interviewed serves to find the potential differences in understanding of the whole process of quality improvement by the top management and the employees. The role of top management is to lead and the role of the employees is dedicated to the operational tasks that might provoke also different perception of quality development. The group of top management will consist of the owner of the company (N. Stojanov), the chief executive officer (CEO) of STOPRO Architects (V. Stichova) and the co-partner of the company (P. Hrcek). The representative of employees will be appointed during the meeting with the CEO of STOPRO Architects. The selected employees have to fulfil the following criteria: to work in the company since its establishment or if there are not such employees than the ones who are working in the company for a longer period of time and they experienced the situation before the ISO certification in 2005. This particular criteria is important for covering all the potential stages that might be demarcated in the quality development process. The second criteria to be considered is that the employees selected should represent the different positions within the company. The particular questions for both groups of interviewees (in phase one and two) will differ considering the different position, tasks and responsibilities of top management and regular employees. The two mentioned criteria for the selection will be told the CEO in order to get an appropriate sample of employees. The result of the first phase of the interviews will be in form of the models with defined stages of quality management development process, the models defined by top management and by the representatives of employees. Before the first phase of the interviews will be studied the internal documents related to quality development to have an overall idea about the process. These internal documents are: Quality system documentation of STOPRO 2006, organizational charts, mission and vision statements the documentation regarding ISO. The aim of the documentation study is

to find in advance the potential actions taken in order to improve the quality and thus facilitate the further interviewees to answer the questions which will be aimed to appoint the specific year of the actions.

The second phase will be based on the results from the first phase where the stage models are determinate. In the second phase of interviews the TQM factors and the barriers to change will be investigated in each stage. Furthermore the type of change will be determined and the steps in quality management will be assigned to all the stages. The same two groups of people will be interviewed to gain the information about the TQM factors presented in each stage and the barriers to change during the transition of one stage to another. Firstly the interviewees will work with the statements derived from the TQM factors and will assign them to particular stage according to its importance. Each group of interviewees will work with the different stage model that comes from the first interview. Further the two groups will be asked to respond several questions related to the organizational change, particularly the barriers to change. In the theoretical part was appointed as a barrier to change the resistance of the employees that can be caused by many reasons. The resistance of the employees will be investigated by interviewing both groups. The top management will be asked about the techniques they used to avoid the resistance and the employees will be asked about the particular problems they met during the transition. The last interview will be done in order to assign the steps of implementing QM into the company to the particular stages. The steps will assign the quality manager that is in the function since 2008 and also the CEO that have undertaken that function before the actual quality manager was appointed.

The result from both phases of interviews will be the stage models of STOPRO Architects quality management process coming from top management and from employees. The models will be compared in order to understand the different point of views of management and employees. The TQM factors and barriers to change will also disclose the potential differences in perception of quality changes by top management and employees. The steps in quality management will be assigned to the stages to have a complete picture of company's quality management improvement process leading to TQM. The scheme of upcoming interviews that include both phases is seen in figure 3.1.

```
┌─────────────────────────────────────────────────────┐
│                        1)                           │
│              Identification of stages               │
│  in STOPRO Architects based on the description of   │
│                   Crosby (QMMG).                    │
└─────────────────────────────────────────────────────┘
        ┌──────────────────┐    ┌──────────────────┐
        │  Top management  │    │    Employees     │
        │   (interview)    │    │   (interview)    │
        └──────────────────┘    └──────────────────┘
        ┌──────────────────┐    ┌──────────────────┐
        │ Stage model 1 of │◄──►│ Stage model 2 of │
        │ company's quality│    │ company's quality│
        │   development    │    │   development    │
        └──────────────────┘    └──────────────────┘

┌─────────────────────────────────────────────────────┐
│                       2a)                           │
│            Investigation of TQM factors             │
│  in each stage within the particular model and the  │
│                 barriers to change.                 │
└─────────────────────────────────────────────────────┘
        ┌──────────────────┐    ┌──────────────────┐
        │       Top        │    │    Employees     │
        │    management    │    │   (Interview)    │
        │   (Interview)    │    │                  │
        └──────────────────┘    └──────────────────┘
        ┌──────────────────┐    ┌──────────────────┐
        │ Presence of TQM  │    │ Presence of TQM  │
        │factors in differ-│    │factors in differ-│
        │ent stages of the │    │ent stages of the │
        │     model 1      │    │     model 2      │
        ├──────────────────┤◄──►├──────────────────┤
        │Strategies to pre-│    │Causes of         │
        │vent resistance to│    │resistance        │
        │change in         │    │                  │
        │particular stage  │    │                  │
        └──────────────────┘    └──────────────────┘

┌─────────────────────────────────────────────────────┐
│                       2b)                           │
│ Identification of steps in change management taken  │
│               in particular stages.                 │
└─────────────────────────────────────────────────────┘
              ┌──────────────────┐
              │     Quality      │
              │     manager      │
              │   (interview)    │
              └──────────────────┘
              ┌──────────────────┐
              │    Steps in      │
              │       QM         │
              └──────────────────┘
```

Figure 3-1 Data collection model - interviews

3.1.1 First round of interviews

The aim of the first interview is to define the stages in quality development process and thus answer the following research questions: *What is the historical development of STOPRO Architects concerning the quality management? What stages in QM leading to TQM can be identified in the company?* For the stage detection will be used measurement categories proposed by Crosby (seen in Crosby's QMMG in appendix 1). Crosby described six measurement categories as management understanding and attitude, quality organisation status, problem handling, cost of quality as % of sales, quality improvement actions, summation of company quality posture. As a starting point for the interview the category about quality improvement actions will be used. The Interviewees will be asked about the crucial actions related to the company's quality management improvement process. Further the interviewees will be asked to explain the causes of particular QM related actions and their motivations. From the particular actions will be derived the stages and compared to the other measurement categories of Crosby. The formulation of specific questions will differ in case of interviewing the top management and the representatives of employees. The reason of different formulations consists in diverse roles played within the process of QM implementation and improvement. While top management works mainly on the strategic level, the employees are engaged mostly in operational level. The particular questions throughout the interviews thus differ when asking top management and representatives of employees. The questions dedicated to top management will be assigned with the letter "M" as management and the questions that pertain to the representatives of the employees will be marked with the letter "E" as employees. A few questions will be aimed asked only to the current Quality manager and these questions will be indicated by the letter "Q". The interview will be divided into two main parts, introduction and the topics and the questions related to the topics that are the actual part of the interview.

1. Introduction

At the beginning during the first interview with top management and representatives of employees the overall goal of the research will be explained in order to give them idea why the research is done. Furthermore the schedule of the interviews and the supposed time consumption of the interview will be discussed. With the aim of avoiding the potential difficulties during the first interview related to the fact that the topics of long past will be discussed, there will be available historical

overview of the company's development in order to help the interviewees to remember the particular years of the actions. This review will come from the study of internal documents of STOPRO Architects.

2. Topics and questions

Actions (quality improvement actions):

The particular actions regarding the quality improvement process are investigated and later the motivation for the actions is assigned separately by top management and employees.

M: What were the different actions taken in order to improve the management of quality within the company?

E: What were the different actions taken in order to improve the quality related to your position within the company?

Causes/motivations:

M: What were the causes/motivations of quality management improvement actions?

E: What were the causes of quality management improvement actions according to your opinion? What was your personal motivation for the action (if there was a motivation?

When there are stated particular actions, the management/employees understanding and attitude, the quality organisational status, problem handling, will be examined according to the QMMG. The cost of quality is excluded because the company does not record it.

Management/employee understanding and attitude:

The comprehension of quality will be derived from the motivation for each action and from the comprehension of the process of QM improvement in the course of time when the particular actions took place. The questions in this section are aimed on the way how top management and employees perceived different actions they demarcated in the previous part. Crosby mentions only the management understanding in his QMMG but for the purpose of this study also the employee understanding will be investigated in order to discover the potential differences in the perception of the actions by those two groups.

M: since when are you willing to provide money on quality development?

M: Did you consider the particular action (change of the system) as helpful/supportive for the overall functioning of the company in that time?

E: Did you consider the particular action (change of the system) as helpful/supportive for your job/tasks in that time?

M: Did you consider the path of QM improvement as an essential for the company in the moment when the particular action was held?

E: Did you consider the path of QM improvement as an essential for your work in the moment when the particular action was held?

Quality organisation status:

The questions in this section are related to the Quality Manager position in order to know when the QM was appointed and since when the quality department is functioning. Further the questions are focused on the way of communication between QM and Top management or employees.

M: When was the quality manager appointed?

M: Since when there is a quality department?

M: What is the communication between you (top management) and the QM? Does the QM provide you with quality related reports or does he receive a special tasks concerning his position?

Q: What is the communication between you (QM) and the top management? Do you provide top management with quality related reports or do you receive any special tasks from top management that are related to the position of QM?

E: What is the communication between you (employees) and the QM?

Problem handling:

The questions in this section are focused on problem handling in the company. The aim is to discover if there is a system of problem prevention or the problems are solved as they occur.

M/E: How are the problems fought now and how was it in the past? Is there any difference?

M/E: Are the problems identified early in the process of development or are the problems fought as they occur? (Compare the situation of now with the situation in the past)

M/E: Is there any system of problem prevention?

M: Are there settled teams in order to deal with potential problems?

M/E: is there any system of corrective action that is linked to the customer complain?

Elaboration on the results:

The interviews will be further elaborated with the aim of the creation of a stage model based on company's real quality development process perceived by top management and representatives of employees. The results from both interviews (from top management and employees) will be assessed separately in order to find out if there are differences in the quality improvement process perception. The result of the interview will be in form of a table where will be stated all the stages with the detailed description identified during the interview.

3.1.2 Second round of interviews

The second part of the interview will be aimed on change management and TQM factors to give the answer to the following research questions: "What were the organizational changes for STOPRO Architects concerning Integration of quality issues into the business strategy? Which factors of TQM are characteristic for different stages in company's development?" The aim of the second round of interviews is to investigate the importance of the different TQM factors within the stages defined during the first interview. In consequence to the identification of TQM factors with particular stages, the barriers to change will be discussed. Finally the steps taken in order to pursue the change will be assigned by the quality manager to the stages. The second phase consist of the interviews of three groups of people: top management (M), representatives of employees (E) and quality manager (Q)

1. Introduction

Introduction of the main topics: TQM factors, barriers to change.

2. Topics and questions

TQM factors

Ones the stages in company's quality development process leading to TQ are detected, the factors of TQM can be researched in those stages. The topics of the interview are related to the factors of TQM that have been chosen in the previous chapter. Each topic (factor of TQM) will be described be one of more statements that would indicate the TQM factor. The interviewees will have a brief description of the stages in front of them and they will be asked to indicate the stage in which the particular statement is true. Each topic (factor of TQM) will be described by several

statements/indicators to which the respondent assigns the number from 0 till 5 where the number 0 means that the statement is not applied in the company and the number 5 means that it is fully applied in the company.

	Stage 1	Stage 2	…	…
a	1	3	5	5
b	2	2	2	3
c	1	1	1	2
d	1	1	3	4
e				
.				
.				

Table 3-1 Example of assessment table

TQM factors and indicators:

The 15 items/indicators (a-o) are examined on a six-point ordinal scale of definite agreement to definite disagreement (0 = definite disagreement, 5 = definite agreement).

1) **Committed leadership/ top management commitment and involvement**

   M: a) We specify the quality related goals.

   E: a) Top management specifies the quality goals.

   M: b) We proclaim the philosophy of continuous quality improvement.

   E: b) Top management proclaims the philosophy of continuous quality improvement.

2) **Employee commitment and involvement**

   M: c) The employees are involved in strategic decisions regarding the quality (as e.g. ISO certification adoption process) and not only operational decisions.

   E: c) I am involved in strategic decisions regarding the quality (as e.g. ISO certification adoption process) and not only operational decisions.

   M: d) The employees are involved in the process of approaching the clients.

   E: d) I am involved in the process of approaching the clients.

3) **Adoption and communication of quality**

   M/E: e) There is a clear and consistent communication of quality mission statement/vision.

4) Customer relationships

M/E: f) There is a comprehensive identification of customers and their needs.

M/E: g) There is alignment of processes to satisfy the needs of the customers.

5) Supplier relationships

M/E: h) Suppliers/subcontractors are selected based on quality rather than price or schedule.

M/E: i) The quality standards are synchronized between STOPRO Architects and its subcontractors.

6) Benchmarking

M/E: j) The best competitive practices are searched and observed.

M/E: k) The organizational service is measured against "Best in Class" service.

7) Training and education

M: l) The quality-related training is given throughout the organization.

E: l) The training in quality issues was given to me.

8) Open organization

M: m) There are empowered work teams which can work independently and we (top management) do not have to lead them.

E: m) I work in different teams that are self-conducted.

M/E: n) There is a horizontal communication (between different departments) within the organization.

9) Measurement and continuous improvement

M/E: o) There is a use of the customer surveys and feedback process to assess customer satisfaction.

Type of the change

What kind of change the particular action caused?

The typology of the change (structural, cultural, process related) will be assigned in the theoretical part for the each action within the stage.

Barriers to change

The stages are already described on the basis of different actions. The barriers to change will be examined by set of questions related to particular change. The different questions will be asked the top management and the employees' representatives to be able to distinguish the different position of both groups toward the change management.

M: What were the techniques to avoid the resistance to change in each stage?
E: How did you experience the changes in each stage?
E: Did you meet any problems?
E: What type of problems?

Steps in QM implementation leading to TQM

The different steps in QM will be assigned to the stages in quality development process of STOPRO Architects defined in the first part of the interview in order to gain a complex view on company's QM improvement. The questions will be based on the seven-step model (figure 3-2) that comes from the literature review chapter about change management. The person to be interviewed in this case is the Quality manager of STOPRO Architects that have the most detailed information about the process of improvement in the company regarding the quality management implementation. The different steps will be assigned by the interviewees to the stages.
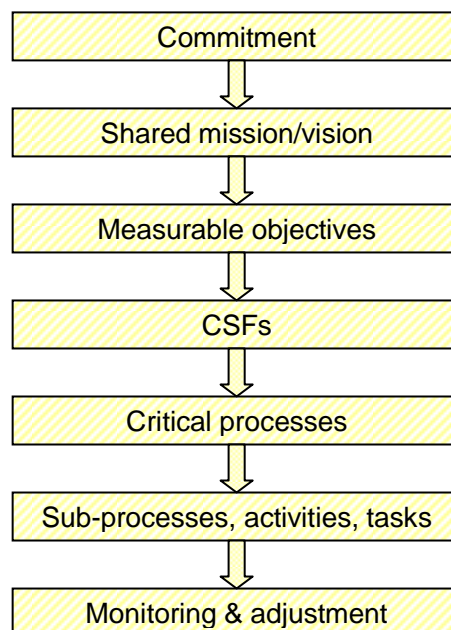
Figure 3-2 Steps in QM improvement

4 Empirical part

The fourth chapter concerns the empirical research where the findings are structured in line with the main research topics: stages in QM development process, TQM factors and change management. The purpose of this chapter is to answer the empirical sub questions stated in the chapter 1.4.3.

- What is the historical development of STOPRO Architects concerning the quality management? What stages in QM leading to TQM can be identified in the company?
- Which factors of TQM and to what extent are present in different stages in company's quality development process?
- What were the organizational changes for STOPRO Architects concerning integration of quality issues into the business strategy?
- What were the obstacles in pursuing quality for STOPRO Architects?
- What where the steps taken in order to improve the quality and to reach the TQM?
- Are there any differences in the perception of QM implementation process leading to TQM by top management and employees?

The empirical part gives the insight into the processes of QM improvement leading to TQM by describing the stages identified during the interviews, TQM factors presented in each stage, changes made in order to move from one stage to another, steps taken during the development process and barriers faced while moving from one stage to another.

For the interviews three members of top management and five employees were selected. The top management of STOPRO Architects consists of the CEO, the owner of the company and the co-partner of the company. The first two mentioned were in the company since its establishment thus the whole process of the development can be compared. The third mentioned came to the company in 2006 thus only the last period can be analysed and compared to the responses of the top management members that have been working in the company since the beginning. Concerning the employees, different professions are represented in order to find the potential perception differences. The professions selected for interviews include positions as architect; engineer; the legislation department employee who provides the support for the engineering department; the current Quality manager and engineer (represents middle management); and finally the assistant of the CEO. Out

of eight interviewees three were women and five men, from these three women one is in top management. The interviewees selected from top management, middle management and employees serve to find the potential differences related to the perception of the whole quality development process. The selection is based on the assumption that there might be differences between the answers of top management and the answers of employees and also there might be differences in answers of people that represent different positions within the company.

4.1 Historical development of STOPRO Architects and stages in development process

- What is the historical development of STOPRO Architects concerning the quality management? What stages in QM leading to TQM can be identified in the company?
  (Stage model with Crosby's measurement categories)

First empirical research question deals with the company's development process in quality. To gain the information about the historical development the top management and the employees of STOPRO Architects were interviewed. Every person selected for the interviews was asked the questions concerning the company's quality development process (detailed questionnaires structure seen in the previous chapters 3.1.1 and 3.1.2).

Every interviewee defined the actions that were taken in order to pursue the quality development path. The respondents' answers in this particular case were in line with the level of involvement in the changes related to the quality improvement actions. The people that were directly involved in the decision making or the process of quality improvement defined more actions thus more stages could be derived out of their responses. The most stages were defined by the top management that initiated the whole process of quality improvement in the company. Both, CEO and owner of the company defined six stages. The second group that identified the most stages concerns of the people that were directly involved in the process of quality improvement as the current Quality Manager and the assistant of CEO. Both of them defined four stages in STOPRO Architects quality development process. The rest of the professions within the company identified as a breaking point in company's quality development process, the moment when the ISO 9001:2000 was adopted in 2005, thus they only identified two stages: before ISO and after the ISO.

The purpose of separate interviews with the respondents was to find out potential differences in quality development process perception. The actual results of the interviews disclose different understanding of quality development by diverse professions presented in the company. While the top management and the QM were able to mention several actions that made the company move from one stage to another, the employees mentioned the only action.

The summation of the actions defined by the interviewees is seen in the table 4.1. According to the answers the general stage model was created to serve as a starting point for other measurement categories described by Crosby. The Model starts with the actions defined by different respondents and these actions remark six stages in quality development process. The stages defined before the year 2005 when the ISO was certified were defined by top management, QM and the assistant of CEO the rest of the employees defined first action in 2005. The QM and the assistant of CEO were directly involved by top management into the process of quality improvement and thus were able to define more stages.

For the first stage is characteristic no awareness about QM and thus can be compared to the stage of *uncertainty* described in the QMMG by P. Crosby. This stage, according to the interviews, was dated since the establishment of the company in 1992 till 1999. First stage is characterized by no organized activities and no awareness about the quality issues. Both, the management and also the employees do not consider quality as a management tool and thus there is no commitment in quality development. Quality is hidden in the engineering department. Problems are solved as they occur and there is no definition of problems that might occur. The management is responsible for the resolution of problems.

The second stage of *management awakening* was between the years 2000 and 2002 when no particular action was done in order to improve the quality management system, but the top management and also QM considered the quality might be of value. In the second stage the idea of a quality as a management tool appeared and thus the top management commitment started. The cause of change in management understanding of quality was the change in company's structure in 2000. In the past the company was led only by one manager who was at the same time the owner of the company. Since 2000 STOPRO Architects had two managers and this situation required precise division of competences. The company in that time was expanding and the number of employees was higher than now (around 36 employees, while today there is 26 employees). The rapid expansion and the change in division of managerial tasks increased the need for the implementation of quality system that would ensure the smoother development of the company.

The third stage is characterized by first realizations of QM improvement actions and can be compared to the stage of awakening described by P. Crosby. The third stage is dated between 2003 and 2004. In this time period was initiated the process of ISO implementation and the major changes occurred. This stage is the first stage when specific actions were held in order to improve the quality system. ISO implementation process included description of all the processes within the company, furthermore the description of tasks and responsibilities related to particular positions. In this phase the tasks and responsibilities described were mainly of positions related to the engineering. The positions in administration were not included into the description in this stage. The cause of the ISO certification application was based on external impulses. The top management wanted to increase the competitiveness of the company by adopting the ISO certification and thus comply with the increasing requirements of the market. The top management was strongly motivated in this stage of the development and the employees were motivated only if they were directly involved in the process of adoption. The employees that were not participating in the ISO certification adoption process did not consider the certification as an essential part of the company's future development in that time period. In 2003 the top management considered the quality as an important part of the company and was prepared to provide money on quality. On the other hand the level of employees' commitment was related to the fact whether they were on were not included into the process of the adoption. Quality is still a part of the engineering. There is no definition of problems and all the problems are fought as they occur.

The fourth stage of *enlightenment* began with the accomplishment of the ISO 9001:2000 in 2005 and for this stage is characteristic the initiation of management and also employees understanding of QM and recognition of QM as supportive tool for the company's functioning. STOPRO Architects went through the fourth stage between years 2005 and 2006. In this stage the description of the position and responsibilities continued that all the positions were included. The cause of the description of all positions was that the top management intended to prepare the company for its extension as well as reduction in staff, in another words wanted to prepare the company for change in employees or management. In the previous stages the know-how of the company was only in heads of several people but with the description of all positions and the responsibilities assigned to them as well as the description of all the processes within the company the situation changed. The survival of the company was not anymore dependent on few people leading it. The company in this stage went through quality improvement program and learned more

about quality management. The quality system became supportive and helpful also for the employees. The quality department was established and the position of Quality Manager (QM) was created. The position of QM executed the CEO of STOPRO Architects. Later on in 2006 the CEO appointed another person as a QM.

In the fifth stage is characterized by the customer focus because STOPRO Architects hired an external company to improve their marketing strategy. The stage was dated during the year 2007. In this stage the focus was already on client side and the company tended to satisfy the needs of its customers. The cause of the action was to attract new clients. The quality management was considered as an essential part of company system by top management as well as the employees.

The sixth stage is characterized by the focus on the continuous improvement and has been defined since 2008 till now. The company started with extensive quality training focused on soft skills and the training was supported by a grant of 80,000 euro. In 2008 STOPRO Architects also went through the process of ISO recertification that led in ISO 9001/2008.

Questions & Categories	Stage I	Stage II			Stage III		Stage IV		Stage V	Stage VI
	1992 – 1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 - 2010
Actions	No awareness about the quality management issues.	No particular action, only the thoughts about the future QM development by top management.			ISO implementation process (job description, task and responsibilities description, process description).		ISO certified, but continuing with job/responsibilities description description (all positions included). Training in quality.		External company hired to improve the marketing strategy.	Extensive quality training (soft skills). ISO recertification => ISO 9001/2008.
Causes and motivation of actions		Management motivation: need for the division of competences between two managers. Extension in employees. No employees motivation.			External impuls: to increase the competitiveness and to be allowed to participate in public tenders. Management motivated, employees motivated only when involved in the ISO implementation process.		The management motivation: to prepare the company for its extension as well as reduction in staff and to be prepared for change of employees or management.		Focus on customers: to attract new clients.	Grant for training (80,000 eur).
Management understanding and attitude	No comprehension of quality as management tool.	Recognized that quality management might be of value but no complete understanding.			Willing to provide money and time on Q because the market requires it = no complete understanding.		While going through quality improvement program learn more about quality management. The quality system becomes supportive and helpful.		Consider quality management as an essential part of company's system.	
Employees understanding and attitude	No awareness about the quality management issues => No comprehension of quality.				Emploees motivated only when they were directly involved into the ISO implementation process.		Recognized that quality management may be of value.			
Quality org. status	Quality is hidden in engineering departments.						Quality department established.	Since 2006 the position of QM is fullfiled.		
Problem handling	Problems are solved as they occur; inadequate definition of problems that might occur. Management is responsible for solving the problems.						Corrective action communications established.			
Summation	Uncertainty - No Awareness about QM	Uncertainty - Management Awareness			Awakening - first QM improvement actions		Enlightenment - QM improvement actions		Customer focus	Continuous improvement

Table 4-1 Stage model of STOPRO Architects

4.1.1 Conclusions of stage model of STOPRO Architects

The general stage model was created in order to answer the sub question dealing with the historical development of STOPRO Architects concerning the quality management. The stages defined in this model are drawn from the interviews made in the company with the top management and the employees. The model (table 4-1) starts with six actions defined by the respondents. These six actions were mostly mentioned by the top management or, as mentioned previously, by the employees that were involved in QM improvement process. Every demarcated action is supported by the information about the cause or motivation for the action. The motivation for actions is closely related to the next two categories that deal with the management understanding and attitude and employees understanding and attitude.

There are certain differences between these two categories. The management understanding of importance of QM improvement appeared in the early stages, the employees understanding and attitude toward the QM improvement started later in the development process. The management/employees understanding and attitude predicate about the commitment to QM improvement process. The top management commitment is originated between years 2000 and 2003 but the involvement of all employees into the process of QM development appeared to be inconsiderable in that time and in fact the majority of employees recognized some changes not until 2005 when the ISO certification was adopted. The major quality related changes happened during the ISO adoption process and thus the main differences are between the period 2003 and 2005 and after the 2005 when STOPRO Architects obtained the certification ISO 9001/2000. The employee understanding is connected to the management attitude toward the QM. Even the management of STOPRO Architects considered that QM improvement may be of value already in 2000-2003, the actions done in 2003 were mostly undertaken in order to meet the market requirements. The ISO implementation process between 2003 and 2005 was thus not transparent and fully understood neither by the top management nor by employees and the real understanding came after the implementation itself in 2005. The consequential period since 2005 was the period when the understanding and attitude of both, top management and employees, changed. The management understanding and attitude plays an important role in the whole process of QM improvement leading to TQM because it has a direct impact on employees understanding and attitude toward QM development process and thus effect the potential cultural change within the company. The management understanding and attitude is a key topic in QM improvement process and a prerequisite for TQM.

4.2   TQM factors

- Which factors of TQM and to what extent are present in different stages in company's quality development process?

The second empirical question deals with the TQM factors represented in different stages defined by the respondents. Every TQM factor is expressed by one or more indicators that have a form of a statement. Each statement (indicator) will be analysed separately in order to describe the progress in QM. The particular indicators will be analysed on the basis of two groups of respondents: top management and employees. The scale used for indicators evaluation is from the value of zero till the value of five, while zero means that the person does not agree with the statement

and the highest value of five means that the respondent absolutely agrees with the statement within the particular time period (stage). The responses will be compared between top management (CEO, owner, co-partner), between employees and also between both groups (top management and employees).

The factors and the indicators were chosen after the literature review as described in the theoretical part. The process of QM implementation leading to TQM supposed that the last stage of the company's QM development that is TQM stage the company scores the high scores in all the factors.

The **first factor** is called *committed leadership/ top management commitment and involvement*. This factor is expressed by two indicators. The indicator *a* is defined in the following statement which differs for top management (M) and for the employees (E):

M: a) We specify the quality related goals.
E: a) Top management specifies the quality goals.

The first statement about the quality related goals was evaluated by all of the respondents and the results are seen in table 4-2. The top management strongly differentiates the period before the ISO and after by using wider range of numbers, the employees tend to give similar numbers in both periods. This situation shows that top management and also the QM and assistant of CEO that were involved in QM development process differentiate more between periods than employees. The top management, the QM and assistant of CEO start on numbers 0 or 1 while the rest of the employees start with higher numbers (2 or 3). The employees thus admit that top management specified quality related goals also before the ISO. On the other hand top management proclaimed that the specification of Q related goals came with the process of ISO certification adoption.

Indicator (a)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	0	0	3	3	4	4	4	4
Owner	1	1	2	2	2	3	3-4	3-4
Partner	x	x	x	x	4	4	4	4
QM	0	1	1	1	4	4	4	4
Administration	0	0	0	3	5	5	5	5
Architect	2	2	2	2	3-4	3-4	3-4	3-4
Engineer	2	2	2	2	4	4	4	4
Legislation	3	3	3	3	2-3	2-3	2-3	2-3

Table 4-2 TQM factors (Indicator a: Quality goals)

The indicator *b* of the first factor concerns the philosophy of continuous quality improvement:

M: b) We proclaim the philosophy of continuous quality improvement.

E: b) Top management proclaims the philosophy of continuous quality improvement.

The situation is comparable to the previous indicator. While top management differentiates more the development process, the employees tend to evaluate both period with similar numbers (seen in table 4-3). The employees thus admit that the top management proclaimed the continuous Q improvement before the ISO as well as after the ISO.

Indicator (b)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	0	0	3		5		5	
Owner	1		2		2	3	4	
Partner	x				4			
QM	0	0			4			3
Administration	0			3	4	4		
Architect	2				4			
Engineer	2-3				4			
Legislation	3				2-3			

Table 4-3 TQM factors: Indicator b

The first factor shows the level of management's commitment in the QM development process leading to TQM by their ability to express it in form of overall quality related goals and the philosophy of continuous improvement that are the basic components of TQM. Even the top management uses the wider range of numbers to differentiate between distinct stages and the employees tend to moderate the difference before and after ISO, both, the employees and also the top management tend to evaluate the last stage with similar values between 3 and 5 in the cases of both indicators. To conclude the first factor, there is no extreme difference between top management and the employees' point of view.

The **second factor** called *Employee commitment and involvement* is also expressed by two indicators *c* and *d*. The indicator *c* is defined as follows:

M: c) The employees are involved in strategic decisions regarding the quality (as e.g. ISO certification adoption process) and not only operational decisions.

E: c) I am involved in strategic decisions regarding the quality (as e.g. ISO certification adoption process) and not only operational decisions.

According to the table 4-4, where the responses of the interviewees are stated, there is a difference between the perception of this indicator by top management and the employees. In the last stages, the top management proclaims

to involve the employees in the strategic decisions than the employees themselves perceive. The only person that marked the current stage with the number five that would mean that the employees are absolutely involved in the strategic decision process related to quality was the QM. The high value the QM used is probably based on the fact that in 2005 he was appointed to the function of QM and also main engineer thus he was involved in strategic decisions.

Indicator (c)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	0	0	2	2	3	3	3	3
Owner	0	0	0	0	0	1	2	2
Partner	x	x	x	x	x	x	3-4	3-4
QM	0	0	0	0	4	4	4	5
Administration	0	0	0	0	0	0	0	0
Architect	2	2	2	2	2	2	2	2
Engineer	0	0	0	0	0	0	0	0
Legislation	0	0	0	0	0	0	0	0

Table 4-4 TQM factors: Indicator c

The indicator *d* of the second factor is:

M: d) The employees are involved in the process of approaching the clients.

E: d) I am involved in the process of approaching the clients.

The situation is very similar to the situation with the previous indicator. The top management believes that the employees are more involved in approaching the clients that the employees themselves. The employees that feel actually involved in the process of approaching the clients are the QM (middle management) and the assistant of CEO who were both also involved into the Q development process.

Indicator (d)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	1	2	3	3	3	3	3	3
Owner	0	0	0	0	1	2	2	2
Partner	x	x	x	x	x	x	2-3	2-3
QM	0	0	0	0	4	4	4	5
Administration	0	0	0	0	2	4	4	4
Architect	3	3	3	3	2	2	2	2
Engineer	0	0	0	0	0	0	0	0
Legislation	0	0	0	0	0	0	0	0

Table 4-5 TQM factors: Indicator d

The second factor dealing with employees' involvement shows indispensable difference between the opinions of top management, middle management or people involved in the QM development process and the regular employees. The

involvement of the employees in the process of QM development process is a way how to ensure the successful implementation of quality system and the involvement in the process of approaching the clients helps the employees to understand the needs of the company's customers thus it helps to improve the quality of the service they provide. When the company wants to reach the level of TQM the employees empowerment and involvement is the way how to pursue this goal. From the results of the second factor is obvious that the employees experience less involvement and empowerment that the top management believe to give them.

The **third factor** is dedicated to the adoption and communication of quality and expressed by the indicator *e*:

M/E: e) There is a clear and consistent communication of quality mission statement/vision.

The communication of mission and vision regarding to quality has developed since the ISO was applied in the company. While before the ISO there were no mission and vision according to most of the respondents, after the ISO the mission and vision were specified and communicated. The results do not differ between top management and the employees and the current stage is mainly evaluated by similar values between 3 and 5. The only person that is more sceptics according to this factor is the owner of the company who evaluates the last stage with the number 2.

Indicator (e)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	0	0	3		4		4	
Owner	0		0		1	2	2	
Partner	x					4		
QM	0	0			3			4
Administration	0			2	5	5		
Architect	2				3-4			
Engineer	1				4-5			
Legislation	0				3			

Table 4-6 TQM factors: Indicator e

The **fourth factor** concerns the *customer relationships* and is expressed by two indicators *f* and *g*:

M/E: f) There is a comprehensive identification of customers and their needs.

M/E: g) There is alignment of processes to satisfy the needs of the customers.

Both indicators are closely related and therefore will be explained together. While the indicator *f* is about the identification of customers and their needs, the indicator *g* is about the alignment of processes to satisfy the needs of the customers.

Comparing the two following tables it is obvious that the indicator *g* is generally marked with higher scores and it is possible to conclude that top management and the employees believe to focus their actions and align the processes to satisfy the clients but on the other hand admit that they have no solid strategy how to identify the clients and their needs. The explanation could be related to the basic characteristics of the company as e.g. its size. STOPRO Architects is a small professional company that have not developed the strategy to identify the clients and their need but on the other hand with every client comes a different project which requires an individual treatment. That explains the fact why the alignment of processes to satisfy the needs of the customers has much higher scores than the identification of customers itself. Even though a settled procedure of customer identification does not exist in STOPRO Architects, there is an effort to align the processes to satisfy the needs of each individual client. This effort comes from the nature of the professional organization. One of the important components of TQM is the proper identification of company's customers and every company that wants to reach the TQM needs to consider the strategy how to identify the customers and their needs.

Indicator (f)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	0	0	0		2		2	
Owner	2		2		2	2	2	
Partner	x					3		
QM	0	2			4		4	
Administration	0			1	2	2		
Architect	1				2-3			
Engineer	4				4			
Legislation	x				x			

Table 4-7 TQM factors: Indicator f

Indicator (g)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	4	4	4		4		4	
Owner	1		2		2	3	3	
Partner	x					4		
QM	5	5			5		5	
Administration	5			5	5	5		
Architect	3-4				4			
Engineer	3				4			
Legislation	4				4			

Table 4-8 TQM factors: Indicator g

The **fifth factor** explains supplier relationships and is expressed by two indicators *h* and *i*:

M/E: h) Suppliers/subcontractors are selected based on quality rather than price or schedule.

This statement refers to the preference in the selection of subcontractors. As seen in table 4-9 the most responses are around the value of 3 and it means that the quality is not the main selection criteria but they admit that there is a progress in this particular issue. The only person that did not admit any progress are the CEO and the legislation department employee. The rest of the respondent agreed on a small progress from the period before and after the ISO certification application.

Indicator (h)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	3	3	3		3		3	
Owner	2		2		3	3	3	
Partner	x				3			
QM	2	3			4			5
Administration	2			2	4	3		
Architect	3				4			
Engineer	3				4			
Legislation	0				0			

Table 4-9 TQM factors: Indicator h

M/E: i) The quality standards are synchronized between STOPRO Architects and its subcontractors.

The indicator *i* explains the level of synchronization of the processes between STOPRO Architects and its subcontractors. Most of the respondents admitted a certain progress in a course of time and the evaluation of the current stage was similar between all the respondents.

Indicator (i)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	0	2	3		4		4	
Owner	1		2		2	2	3	
Partner	x				4			
QM	0	1			3			4
Administration	0			3	5	5		
Architect	1				2-3			
Engineer	2				4			
Legislation	2				2			

Table 4-10 TQM factors: Indicator i

The **sixth factor** called *benchmarking* is described in two statements *j* and *k*:
M/E: j) The best competitive practices are searched and observed.
M/E: k) The organizational service is measured against "Best in Class" service.

Both indicators are evaluated in a very similar way. There is a slight progress in a course of time especially related to the moment of ISO implementation. The current stage is evaluated with similar number by top management as well as by the employees and the values differ between 3 and 5.

Indicator (j)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	3	3	3		4		4	
Owner	3		4		4	4	4	
Partner	x				4			
QM	5	3			4		5	
Administration	0			0	3	3		
Architect	3				3-4			
Engineer	2				2			
Legislation	3				3			

Table 4-11 TQM factors: Indicator j

Indicator (k)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	3	3	3		4		4	
Owner	3		3		4	4	5	
Partner	x				3			
QM	1	1			2		3	
Administration	0			0	3	3		
Architect	3				3-4			
Engineer	2				2			
Legislation	x				x			

Table 4-12 TQM factors: Indicator k

The **seventh factor** concerns the training and education and is described in one indicator that differs for management and for employees:

M: l) The quality-related training is given throughout the organization.

E: l) The training in quality issues was given to me.

The statement *l* shows the progress in quality related training given throughout the organization. From the answers can be concluded that there is an evident progress in course of time and the current situation was mostly marked with the highest scores. The quality related training was initiated with the ISO implementation process and since that time is developing. In 2008 the company received the grant for training and education of employees and management especially in soft skills and therefore the current stage scores the highest values.

Indicator (l)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	0	1	5		5		5	
Owner	1		1		2	3	4	
Partner	x				5			
QM	0	0			2		5	
Administration	0			4	4	4		
Architect	1				3			
Engineer	3				4			
Legislation	2				4			

Table 4-13 TQM factors: Indicator l

The **eight factor** called *the open organization* is divided into two following indicators:

M: m) There are empowered work teams which can work independently and we (top management) do not have to lead them.

E: m) I work in different teams that are self-conducted.

M/E: n) There is a horizontal communication (between different departments) within the organization.

The evaluation of both indicators is similar throughout all the interviewees and is basically high scored. The reason is that the company from the beginning worked on the basis of teams and the size of the organization that had max around 40 employees tend to support the communication between employees and the top management.

Indicator (m)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	5	5	5		5		5	
Owner	4		4		4	4	4	
Partner	x				5			
QM	3	5			5		5	
Administration	2			2	5	5		
Architect	4				4			
Engineer	4				4			
Legislation	5				5			

Table 4-14 TQM factors: Indicator m

Indicator (n)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	5	5	5		5		5	
Owner	4		3		3	3	3	
Partner	x				4			
QM	5	5			5			5
Administration	4			4	4	4		
Architect	3-4				3-4			
Engineer	3-4				3-4			
Legislation	3				4			

Table 4-15 TQM factors: Indicator n

The last **ninth factor** called measurement and continuous improvement is expressed by the following indicator:

M/E: o) There is a use of the customer surveys and feedback process to assess customer satisfaction.

In the evaluation of this particular statement were several differences. While the CEO and the employees admitted a large progress and the current stage evaluated mostly by the number 4, the QM and the owner were more sceptical. The explanation for this situation is that the QM proclaimed that the customer surveys and feedback process are done only occasionally. On the other hand the owner of the company evaluated the indicator till the year 2004 with higher score than after 2005. He explained that till 2004 the evaluation was done by him because he was the only one having a regular contact with the customers and later on when the managerial tasks were divided between other employees, the customers communicated also with other top management members or employees. The indicator shows to which level the company process the feedback from its customers and the results show that there is a significant difference between the members of top management and also between QM and the rest of employees. The difference which has to be emphasized concerns the low number that evaluated the QM. QM is supposed to be a person that is most involved in the tasks regarding the quality within the whole company and if the QM admit that the feedbacks from customers are assessed only occasionally, it indicates the inadequacy concerning to this statement.

Indicator (o)	1992 - 1999	2000 - 2002	2003	2004	2005	2006	2007	2008 -2010
CEO	1	1	2		3		4	
Owner	3		3		2	2	2	
Partner	x				4			
QM	1	1			2			2
Administration	0			3	4	3		
Architect	2				4			
Engineer	0				4			
Legislation	2				4			

Table 4-16 TQM factors: Indicator o

The current stage was defined by most of the employees already since 2005 and by the top management and QM later in 2007 or 2008. Even though the time definition is different, it is still possible to do the comparison between different interviewees. In the following table 4-17 all the values regarding the current stage are quoted. The table is divided into three groups: top management, middle management and the employees. In the bottom part of the table are stated the average values for each respondent. From all the respondents, the QM (middle management) has the highest average value and the employee from the legislation department has the lowest value. The rest of the average values are very similar and vary between 3 and 4.

The lowest score has according to top management the indicator *f* about *a comprehensive identification of customers and their needs* and according to the employees the indicator *c* about *the employees involvement in strategic decisions regarding the quality (as e.g. ISO certification adoption process) and not only operational decisions*. At the beginning in theoretical overview was mentioned one general definition of TQM as a customer oriented management system that aspires to continual increase in customer satisfaction. When using this simple definition and comparing it to the case of STOPRO Architects, the indicator *f* should score the highest numbers in the current stage in order to accomplish the prepositions of TQM stage.

On the other hand the highest score according to the top management have the indicator *l* which is also highly scored by the employees and refers to *the training and education*. The employees as well as the management evaluated the indicator *m* (empowered work teams) with the highest scores. In TQM stage the company is supposed to work on the basis of the teams that are independent.

Ind.	Owner 2007 - 2010	CEO 2007 - 2010	Partner 2006 - 2010	QM 2008 - 2010	Admin. 2006 - 2010	Architect 2005 - 2010	Engineer 2005 - 2010	Legislation 2005 - 2010	Management Average	Employees Average
a	3.5	4	4	4	5	3.5	4	2.5	3.83	3.75
b	4	5	4	3	4	4	4	2.5	4.33	3.63
c	2	3	3.5	5	0	2	0	0	2.83	0.50
d	2	3	2.5	5	4	2	0	0	2.50	1.50
e	2	4	4	4	5	3.5	4.5	3	3.33	4.00
f	2	2	3	4	2	2.5	4	x	2.33	2.83
g	3	4	4	5	5	4	4	4	3.67	4.25
h	3	3	3	5	3	4	4	0	3.00	2.75
i	3	4	4	4	5	2.5	4	2	3.67	3.38
j	4	4	4	5	3	3.5	2	3	4.00	2.88
k	5	4	3	3	3	3.5	2	x	4.00	2.83
l	4	5	5	5	4	3	4	4	4.67	3.75
m	4	5	5	5	5	4	4	5	4.67	4.50
n	3	5	4	5	4	3.5	3.5	4	4.00	3.75
o	2	4	4	2	3	4	4	4	3.33	3.75
A.	3.10	3.93	3.80	4.27	3.67	3.30	3.20	2.62	3.61	3.20

Table 4-17 TQM factors presented in the current stage

In the following graphs (figure 4-1 and 4-2) are stated the scores of top management and the QM and then separately the employees. From the graphs is obvious that the top management evaluated the current stage with numbers between 2 and 5 but the employees used the whole range, including the 0 value. The zero value was mainly used in case of the second factor that deals with the employees' commitment and involvement in strategic decisions and approaching the clients.

The TQM stage would be characterised by higher level of stability in values given to different statements. When considering the fact that the period recorded in the graph is a current stage that was achieved after a long process of QM development, the values should correspond to TQM stage.
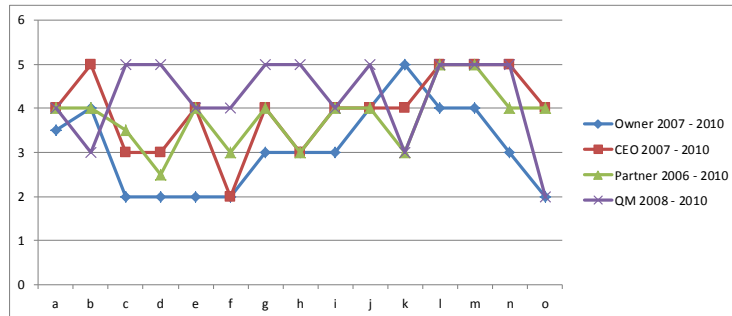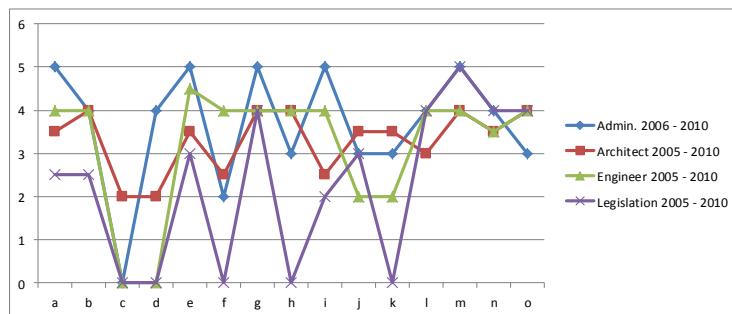

Figure 4-1 Current stage according to management

Figure 4-2 Current stage according to employees

4.2.1 Conclusions of TQM factors

To conclude the TQM factors part, the summation of main differences between top management, different employees that represent divers positions within the company and the differences between the top management and the employees will be summarized.

The employees and the top management gave the opposite answers in case of the indicator dedicated to the level of employees involvement in decision making in quality and the involvement in approaching clients. The other significant difference was disclosed the indicator about the processing the feedback from STOPRO Architects clients. While the QM and the owner of the company admitted that it is done only occasionally the rest of the management and employees assigned a high score to this indicator. The difference in responses indicates that the surveys among the company's clients and processing of feedbacks are not done in an organized way.

Furthermore the employees tend to evaluate the period before ISO with higher values than the top management or the people involved in the process of QM improvement and thus moderate the difference between the two stages. According to the interviews done with the employees most of them tend to derogate a difference between the periods before and after the ISO unless they differentiated it in the second part of the interview by admitting that the path of QM improvement was beneficial for the company and for their specific work.

4.3 Management of change in STOPRO Architects

- What were the organizational changes for STOPRO Architects concerning integration of quality issues into the business strategy?
- What were the obstacles in pursuing quality for STOPRO Architects and what were the strategies to overcome the barriers to change??
- What where the steps taken in order to improve the quality and to reach the TQM?
- Are there any differences in the perception of QM implementation process leading to TQM by top management and employees?

The change management is closely related to the process of development which is in this case a quality related development. In the theoretical part were mentioned several types of organizational changes, the obstacles related to these changes and also the steps taken in order to improve the quality.

Oakland (1993) mentioned seven steps of integrating TQM into the business strategy and these steps are: gaining commitment to change through the organization; developing a shared mission or vision related to the change; defining the measurable objectives; development of the mission into its critical success factors (CSFs); CSFs are broken down into the critical processes; definition of sub-processes, activities and tasks; monitoring and adjustment of process alignment in order to prevent the difficulties in change process. Concerning the above mentioned steps the management commitment to change was originated already in 2000 but the management gained the commitment of the employees later after the year 2005. Most of the steps took place between years 2003 and 2005 when the process of ISO certification implementation was in progress. The steps done in this period were the development of shared mission/vision related to the QM improvement; definition of the measurable objectives/goals; development of the mission into its critical success factors (CSFs); CSFs are broken down into the critical processes. Furthermore after the ISO implementation in 2005 the company continued in the development process by specifying the CSF and shifted toward the monitoring and adjustment. The steps in accordance to the changes related to QM development were mainly related to the ISO 9001 adoption process and thus occurred between years 2003 and 2006.

In the theoretical part several types of organizational change were defined as the cultural, structural and the process change that should be taken into consideration while implementing TQM. The structural change requires the

redefinition of the relationship between units or workers. The processes change refers to the activities that are held within the company and also across its boundaries and is called business process re-engineering. Cultural change focuses on employees and their attitudes. The cultural change concerns the change of the way that employees think about their work. During the ISO implementation process between years 2003 and 2005 in STOPRO Architect occurred mainly structural and process related changes. In that time the structural changes were prepared and in 2005 the company was internally divided into 7 divisions: Communication and personnel, Sales and Marketing, Finance, Design and Engineering, Quality and HR, Public Relations, Top management. The structure before this division was more simple and consisted of two levels the top management and then all the employees. In 2005 also the level of middle management was included.

The other mentioned and observed factor in change management is a barrier to change. As described in the theoretical part, barriers/obstacles to change can be caused by the organization or by the individuals. Organizational barriers to change mentioned in the theoretical part are: structural inertia, existing power structures, and resistance from work groups or failure of previous change initiatives. On the other hand the individual barriers to change are: tradition and set ways, loyalty to existing relationships, failure to accept the need for change (the change can be seen as formalistic, bureaucratic, not necessary), insecurity, preference for the existing arrangements, break up of work groups, different person ambitions, fear of (loss of power, loss of skills, loss of income, the unknown), redundancy, inability to perform as well in the new situation. The company during the implementation of QM leading to TQM faced the employees' resistance to change. The employees' resistance to change was detected from the interviews done with the employees and also with the top management. All of the employees interviewed admitted that they had considered the changes as not necessary and too bureaucratic during the ISO implementation process. The employees' resistance to change is connected to the attitude of top management. The top management confirmed this information because also between top management there were tendencies to see the changes linked with ISO as formalistic and not useful for the company itself. Even the management commitment into the process of QM development started already in 2000, there was no full understanding of the QM. The complete understanding came after the ISO implementation in 2005 when the Top management considered the QM improvement path as essential for the future development of the company. This development is connected with the motivation the top management had in pursuing the QM. As

explained during the interviews, the reason for implementing such a system did not come that much from the internal need as because of the market pressure.

The last factor observed in the company STOPRO Architects is the strategy to overcome the barriers to change. The top management proclaimed that the strategy to overcome the employees' resistance is a higher level of involvement in the process of QM development. According to Oakland, J.S., 1993, p. 409, the tools how to deal with the resistance are education, communication, participation and involvement, facilitation and support, negotiation and agreement. In STOPRO Architects the communication of quality related changes was done in to all employees in the same way.

Questions & Categories	2000	2001	2002	2003	2004	2005	2006	2007	2008 - 2010
Steps	The origin of top management commitment to the idea of future QM development.			Commitment, Shared mission/vision, Measurable objectives, CSFs, Critical processes.		Commitment, Shared mission/vision, Measurable objectives, CSFs, Critical processes Sub-processes, activities, tasks, monitoring and adjustments.			
Type of changes				Phase of major changes => structural change and process change.					
Barriers	Top management not fully convinced that QM development will be of value for the company itself, but considered QM development as inevitable in order to pursue the market trends.			QM development still not exactly undersood by top management => emploeees resistance to change.		Not absolute understanding of QM development actions by all the company's employees.			Not everybody in the company commited to the idea of continuous improvement. For somebody it is not necessary to improve more.
Top management strategies to overcome the barriers				Employee involvement in the ISO certification implementation process.		The training in soft skills and quality for the employees and also for the top management.			

Table 4-18 Steps, changes, barriers and strategies to overcome the barriers

4.3.1 Conclusions of change management

The factors chosen for the description of the change management in the company of STOPRO Architects are closely interrelated. The steps taken in order to improve the quality, the changes provoked by these steps/actions, barriers to change that might appear while implementing a new system and finally the management strategies taken in order to prevent the potential obstacles/barriers to change. In case of STOPRO Architects most of the steps and thus changes occurred during the period of ISO implementation between 2003 and 2005. The barriers to change were caused by lack of management understanding of a whole process of QM improvement in the early stages and that led in an inadequate communication of such changes to the employees. The explanation was focused on a necessity of such

a system as ISO to be able to survive in the competitive environment thus the other advantages of QM improvement was neglected and it provoked the sceptical attitude of the employees.

4.4   Conclusions of empirical part

The empirical part is a compilation of findings about STOPRO Architects quality related development process. The three main topics were discussed in the empirical part: stage model of STOPRO Architects, TQM factors and management of change. All three topics are characterized by several factors that were investigated on the case of company STOPRO Architects. During the investigation and as a result of the empirical part several issues revealed and these issues are presented and developed in the following analytical section of the thesis.

5 Analysis

- Which factors have an effect on QM implementation leading to TQM in STOPRO Architects, and how they effect?
- What are the relationships between factors presented in the empirical part that influence QM implementation leading to TQM in STOPRO Architects?

The analytical part of the thesis will deal with relationships between investigated factors: stages in QM development process, TQM factors, indicators; steps, changes, barriers and strategies to overcome the barriers. In the previous chapter are described main findings especially from the interviews.

The empirical part gives the overview about the whole process of QM implementation in one particular company. The first part was dedicated to the stage model of company STOPRO Architects, in the second part were elaborated the TQM factors presented in different stages of company's development process and the last part was dedicated to the steps, changes, barriers and strategies to overcome the barriers. The stages were defined according to the quality management maturity grid (QMMG) developed by P. Crosby which served as a starting point in evaluating the factors of TQM and change management in each stage of the company's QM development process.

The factors of TQM and change management can be considered as factors that influence the process of QM implementation and thus are the subjects of the investigation. From the description of all factors can be derived a general outline for the process of QM implementation leading to TQM which comes from the case study of STOPRO Architects. The outline consists of the following factors or topics that arose from the empirical part (seen in the figure 5-1): management motivation and expectations, management commitment, communication (management communication of changes in QM to employees), actions taken in order to change quality system, the cultural change (seen in figure 5-1). These topics and factors can be considered as factors that influence the process of QM implementation in studied company and thus will be elaborated in the further text.
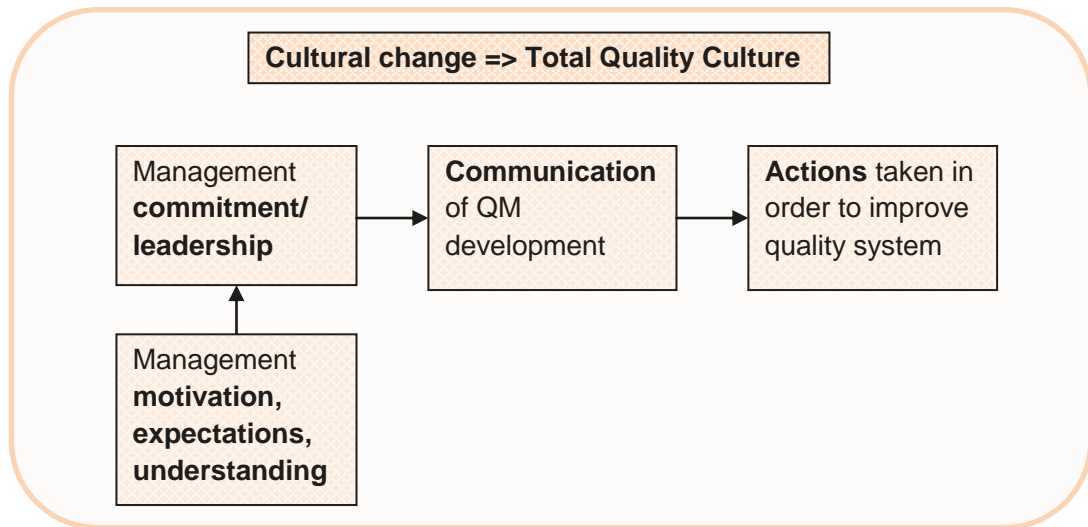
Figure 5-1 Relationships between selected factors

The general outline serves as a starting point for the evaluation of the whole process of QM improvement. The topics mentioned are interconnected and other will be associated to them in order to make the picture complete. The process of QM improvement starts with the committed leadership or management commitment and is closely related to the management motivation and expectations. These two topics arose from the case study and can be considered as important for QM implementation leading to TQM in the company STOPRO Architects. The process starts with the decision of the top management to follow the path of QM improvement. In this moment the management decides under a certain motivation and from that are derived the expectations. As stated in the empirical part, STOPRO Architects top management motivation to follow the path of QM improvements and to implement ISO certification was firstly provoked by the market demand. In their case the motivation for the QM development was the impulse from the market and thus the expectations concerned the improvement of the position on the market. The level of management commitment is therefore directly affected by their motivation, expectations and also understanding. The QM improvement process was initiated because it was considered as inevitable for further company functioning on the market. The impulse came from the outside of the company and the top management was not fully convinced about the advantages that it could bring to the company but pursued the path of QM improvement because it was a trend in the industry. The top management understood the QM as something that is necessary to implement because the market requires it. Once the top management decides to follow the QM implementation process, the communication part takes place.

The communication of QM related changes to the employees forms an important link in the process of company's QM development because the employees learn about the process, form their own opinion and share the motivation and expectations with the top management. The level of employees' acceptance of QM related changes thus depend on the way top management communicate it. However the way top management communicates its decisions is based on the way the management understands the initiated process of change. In STOPRO Architects the information about the QM implementation was communicated and explained to all employees in the same way. The explanation was based on the management motivation and understanding. The top management explained the QM implementation as necessary and inevitable because it is required from the market. The basic message they gave to the employees was: *"We are not sure if QM can improve functioning of our company, but we need to improve it because the market and our clients requires it."* Furthermore the actions are taken in order to improve the QM within the company. These actions are for example ISO certification implementation, improvement of customer/supplier relationships, training or employees empowerment.

The last topic mentioned in the general outline is the cultural change. The cultural change concerns the way that employees think about their work. When the company wants to achieve the cultural change the management has to be committed, the intentions of top management has to be communicated to the employees, the actions in order to improve the system has to be accomplished and the whole process has to be understood by management and by the employees. The cultural change is thus determined by all previously mentioned topics.

5.1 Management commitment / management motivation and expectations

The first mentioned topic concerns the management commitment to the idea of QM development. The management commitment is closely related to management motivation for QM development and management expectations that come from the QM development process. The management leadership and commitment together with employee involvement are considered in most of the TQM literature as essential for TQM program (Obeng, K., Ugboro, I. O., 2000, p. 248). According to A. Seetharaman, Jayashree Sreenivasan and Lim Peng Boon (2006) the frequent reason why TQM fails is lack of knowledge about TQM implementation. Further they

defined specific reasons that led in the failure of TQM: lack of management commitment and management understanding on quality or lack of understanding about the positive results of continuous improvement.

The management commitment is subordinated to the management motivation and expectations. In the empirical part in the section 4.3 about the change management are described the barriers to change. In early stages of STOPRO Architects QM improvement process was mentioned as a barrier to change not absolute understanding of QM by top management. This information came from the interviews with top management when they admitted that their motivation was based more on rapid satisfying of clients by implementation of ISO certification rather than considering the QM as an important managerial tool that might be of value for the company itself. The first motivation for the QM improvements was thus connected with the need concerned the external market requirements. The expectations were thus related to the motivation and concerned the better position on the market. The management commitment in STOPRO Architects to QM development process in that time period (2000-2002) was based on external market pressure rather than the internal need for QM system improvement. The motivation comes from the outside of the company and the company takes it as an obligation that has to be done in order to survive in the competitive environment.

Based on the literature review the management commitment is a very important factor to be considered while implementing the QM in the organization and the study of the company STOPRO Architects confirms that fact. Moreover from the case study emerges the importance of management motivations, expectations and understanding that have a direct impact on management commitment.

5.2 Communication

The communication is one of the most used strategies how to overcome employees' resistance to change. The top management explains to employees the QM improvement process and the reasons that are behind such a change. When interpreting communication as a tool, it is considered to be a critical for understanding and change people's attitudes and behaviour (Heide, M., 2008, p. 293). The people attitude and behaviour will be further explained in the section 5.4 about the cultural change.

The communication of QM development in STOPRO Architects was influenced by two factors: the motivation of top management that was transmitted to

the employees and the way how the top management approached the employees. Concerning the first factor, the communicated reason for QM development was the external impulse from the market. During the implementation phase even the top management was not fully convinced about all the advantages that such a system can bring for the company's functioning. The communication of the change was thus influenced by the attitude and level of understanding of the top management. When the management started to be convinced about all the advantages that were brought by the QM improvement process, the communication did not change appropriately.

Secondly, the communication of such information about the necessity of adopting the ISO certification was done to all employees in the same way. The employees were still approached as a whole with no distinction between different professions presented in the company. In the company are presented different age groups and different positions as e.g. architects or engineers and every group of people requires different treatment regarding the communication of potential changes in the company. The fact that STOPRO Architects management approach all the employees in the same way and did not distinguish between different subgroups could be one of the reasons for early employee resistance to change. Lewis quoted Lucas (1987) that developed a political-cultural approach for studying organizations in which he pointed that the subgroup should be a unit of analysis because these subgroups create an overall culture (Lewis, 1996a, p. 15).

As results from the literature about the communication of changes in the organizations, the communication can serve as an important tool to overcome potential employee resistance. The case study of STOPRO Architects disclosed that the employees adopted the attitudes toward changes from the management. The attitudes, motivation, understanding and expectations from QM improvement process were directly transmitted from top management to the employees. As in the early stages the top management did not consider the QM as an essential part of the company that might be of value, the employees shared the same feelings. Even though the company is small, there are several sub groups that require different treatment and different way of communication and the fact that the communication in STOPRO Architects was done in the same way increased the resistance to change.

5.3 Quality related actions

The actions that change and improve QM in the organization can have different forms and for that reason the section about the QM related actions will be divided into several subsections. The actions chosen to be described come from the empirical part. Most of the actions occurred between years 2003 and 2005 while the ISO 9001 had been implemented.

5.3.1 Employee involvement and empowerment

Widely used definition of empowerment is the one suggested by Conger and Kanungo (1988) in (Obeng, K., Ugboro, I. O., 2000, p. 249). They define empowerment as "a process of enhancing feelings of self-efficacy among organizational members through the identification of conditions that foster powerlessness, and through their removal by both formal organizational practices and informal techniques of providing efficacy information." The level of empowerment is according to several studies (Miller and Monge, 1986 or Wooldridge and Floyd, 1990 quoted in Obeng, K., Ugboro, I. O., 2000, p. 264) closely related to the customer satisfaction.

STOPRO Architects employee involvement is described by the second factor called *Employee commitment and involvement* which is expressed by two indicators. The first indicator is about the employee involvement in strategic decisions regarding the quality. This particular indicator is perceived differently by management and by employees. Especially in last stages, the top management proclaims to involve the employees more in the strategic decisions than the employees themselves perceive. The second indicator is about employee are involvement in the process of approaching the clients where the situation is very similar to the situation of previous indicator. From these two examples different perception of top management and the employees in empowerment and involvement issues can be observed.

The employees' empowerment cannot be achieved in the short time period but it requires a long process of development (Honold, L., 1997, p. 210). The process of empowerment requires multidimensional approach that consists firstly of leadership that is aimed on individual development of the members and creating common vision and goals and finally continuous environmental scanning and apartment to it. Secondly, the multidimensional approach suggests working in teams within a decentralized structure. Furthermore the multidimensional approach suggests the

personal responsibility for performance, cross-training and multi-skilling jobs, pay for performance and win-win strategies. In other words, the employees empowerment should be seen from different perspectives rather than think only about the managers delegation power to subordinates. The multidimensional approach allows including the whole range of different angles in the issue of empowerment as leadership, individual reactions of employees, peer interactions, or structure of processes within the organization (Honold, L., 1997, p. 210).

The empowerment was in the previous part described as multidimensional and it is also connected to other actions described in the section of QM related actions. The research in the company disclosed different points of view on employee involvement and empowerment by different groups of employees and top management. These differences are based only on the involvement in the strategic decisions and the involvement in approaching the client. Nevertheless the employee empowerment has different angles as mentioned previously and does not mean only delegation of power. The multidimensional approach emphasizes the leadership aimed on individual development of the members or cross-training and multi-skilling jobs as a prerequisite for empowerment. In case of STOPRO Architects some of the presumptions are fulfilled as enhanced training, multi-skilling jobs or working in teams. While company went through QM development process the empowerment of the employees was rising and the character of the company was changing from the typical functional division to more decentralize.

5.3.2 Customer and supplier relationships

Closer customer relationships and closer supplier relationships were determined as two out of twelve TQM factors by Powell (1995, p. 19). The first mentioned concerns of determining customers' (both inside and outside the firm) requirements and furthermore meeting those requirements. On the other hand closer supplier relationships require working closely and cooperatively with suppliers and ensure that their outcome fit to customers' end-use requirements (Powell, 1995, p.19).

The first mentioned factor was investigated in STOPRO Architects and it was found that even thou the company allies the processes to satisfy the needs of its customers, there is no systematic way of identification of these customers. In the case of the second mentioned factor, the company follows the guidelines of ISO certification that requires the synchronization between company itself and its subcontractors as well as the assurance of the quality of its subcontractors.

5.3.3 Benchmarking and continuous improvement

Benchmarking concerns of observing the best practices and trying to reach them. The importance of this factor consists in its focus on continuous improvement which is a key factor of TQM. The research in the company showed that the best competitive practices are observed, but the company does not measure its service against those that were observed as "Best in Class."

5.3.4 Training and education

Training and education throughout the whole organization helps to understand the changes and to prevent the resistance to change from the employees. In general quality related training should help the company to deal with the change that is connected to the QM improvement process and thus create a support for cultural change. In STOPRO Architects the quality related training started in the later stages of the process and thus the employees understanding came later in the process. The increased training especially in soft skills started in 2008, while the process of QM improvement was initiated already in 2003. The quality related training in STOPRO Architects started slowly in 2005 and escalated in 2008 when the company obtained the grant for training in soft skills.

5.3.5 Measurement and continuous improvement

The customers feedbacks or other statistical surveys done in order to ensure the continuous improvement are often mention in the literature as important while pursuing TQM approach (Powell, 1995, p.19). The research in the company STOPRO Architects shows that even though the measurement techniques are described by the ISO, the reality is, that such surveys are not done in the company. For accessing the customer satisfaction is suggested to use customer surveys and feedbacks. In STOPRO Architects are customer feedbacks done only occasionally and not really processed because there is no clear responsible person for this action.

5.4 Cultural change

Lewis quotes Jacques (1951) defining the organizational culture as "the customary and traditional way of thinking and of doing things, which is shared to a greater or lesser degree by all its members, and which new members must learn, and at least partially accept, in order to be accepted into service in the firm" (Jaques quoted in Lewis, 1996a, p. 12).

The important aspect to be considered while implementing the TQM concerns the attitudes of organizations members. Attitudes toward quality of all the organizational members are one of the preliminary determinants of the future success or failure of the TQM implementation (Vermeulen, W., 1997, p.40). The quality culture in the organizations means how quality is interpreted and viewed by the members of the company. The quality culture is dependent on all the previous topics discussed, because these topics basically create the background for the cultural change. As explained previously when the management is committed to TQM and the communication of new strategies works, the company send signals that are perceived by the employees who adjust their behaviour according to these signals. The signals that the company sends in the form of day to day actions can be interpreted differently by the employees (Vermeulen, W., 1997, p.40). In STOPRO Architects the cultural change did not happen because the process of QM implementation started before the top management understood it and employees adopted the same attitude and understanding as top management.

The section about the management of change provided information about the changes that can be connected with the implementation of QM leading to TQM. In general implementing TQM requires a large amount of change (Vermeulen, W., 1997, p.41). The changes are on the level of the system, or structure and also on the level of people behaviour and attitudes. One of the most frequently used definition of TQM is a customer focus and that cannot be without the change in organizations members' attitude toward the customer and the importance of meeting customer needs. The frequently used terms regarding quality culture or cultural change are attitude and behaviour. These two concepts were explained by Harber et. Al. (1993) in (Vermeulen, W., 1997, p.41). The attitude is explained as "a learned preposition to respond in a consistent way to a given object, idea or situation"; behaviour is "the observable outcome of the action taken by a person in response to an internal or external environmental stimulus."

The successful adoption of TQM requires both, structural and also cultural change. The cultural change is determined be all the mentioned topics as management leadership and commitment, employee empowerment and is aimed in customer satisfaction (Obeng, K., Ugboro, I. O., 2000, p. 264). Even though the top management and the employees of STOPRO Architects are nowadays concerned about the advantages of QM, it is still not possible to talk about a cultural change in the company.

5.5 Conclusions of analytical part

The implementation of QM leading to TQM is a complex process that is influenced by a large number of factors. Powel quoted Ross (1993) that described TQM as "an integrated management philosophy that emphasizes, among other things, continuous improvement, meeting customers' requirements reducing rework, long-range thinking, increased employee involvement and teamwork, process redesign, competitive benchmarking, team-based problem-solving, constant measurement of results, and closer relation-ships with suppliers (Powel, 1995, p. 16).

The analytical part gives the overview about the topics that should be taken into the consideration while describing the QM improvement process. The topics arose from the case study of STOPRO Architects where several factors were investigated. The aim of the analysis was to evaluate the different factors in the context of the QM development process and to find out the role that those factors play in the process that leads to TQM. The factors are described separately but there is a strong connection between them. The outline used in the analytical part consists of the following topics/factors: management motivation and expectations, management commitment and leadership, communication, QM related actions and at the end these factors are completed by the last factor of cultural change that embodies all the previously mentioned factors.

The successful implementation of QM leading to TQM depends on the level of implementation of the factors mentioned in the outline. The failure of TQM implementation is often caused by not complete implementation, it means that implemented are only those aspects of TQM supported by existing organizational culture (Obeng, K., Ugboro, I. O., 2000, p. 264). In such a situation the cultural change is not accomplished and thus the TQM stage not achieved. The cultural transformation, from the existing to total quality culture, is necessary for successful implementation of TQM.

6 Conclusions, recommendations and discussion

- What are the findings drawn from analysis of a case study?
- Does the case study of STOPRO Architects confirm the specifics of small professional companies related to QM implementation?
- What can be recommended to the company STOPRO Architects based on the case study research and what can be recommended for the further research?
- Was the chosen research strategy adequate to the investigated topic?

In the following chapter 6.1 the final conclusions will be summarized, the recommendation for the company STOPRO Architects based on the analysis and the recommendations for potential further research will be done. At the end the overall research will be evaluated in the discussion part.

6.1 Conclusions

In the conclusions part are discussed the factors of QM leading to TQM as they are described in the previous sections and how are these related to the characteristics of small professional companies. The result of this chapter is to explain the findings about QM implementation leading to TQM in small professional organizations.

The SPCs form a specific group of organizations and function quite differently than other traditional companies. Professional service companies share some characteristics as specified knowledge, high degree of training in intellectual skills, use of individual judgement, high degree of autonomy, independent actions, self-motivation, provision of advisory and problem oriented service, identification with and adherence to the standards regarded to the profession (Haywood-Farmer, J., Nollet, J., 1993, p. 6). The professionals have a right to decide what is wrong and what is right and what has to be done and how it will be done. This right come from law or convention and it is usually a reason why professionals are unwilling to accept advice from someone outside his or her area of expertise (Haywood-Farmer, J., Nollet, J., 1993, p. 8). In case of STOPRO Architects there are few different professions represented in the company as architects, engineers or administration support. Even in one small company there can be several sub groups that perceive the changes in different ways. In case of STOPRO Architects there were several differences

between the respondents and each person for instance created a slightly different stage models of company's QM development that showed the different perception of changes made in the company. This fact shows that there should be also different communication strategies to these sub groups.

Haywood and Nollet (1993) explain some successful stories of TQM implementation in professional service companies where at the beginning there was initial scepticism from the part of the management. Once the partners (management) received a positive feedback from the clients, the acceptance of TQM raised. The result of the positive acceptance was a shift of power in the company from the partners to customers, to other professionals (employees) and finally to the whole firm and TQM thus changed the culture in the company (Haywood-Farmer, J., Nollet, J., 1993, p. 10). In case of STOPRO Architects the cultural change did not occur and there is also a double view on empowerment: management believe to empower employees more than they feel.

Furthermore Haywood and Nollet (1993) described that employees of professional company as well as their clients believe that the technical quality will be high. They also mentioned that even the technical quality is very important; there are also other things to be considered. The clients appreciate also timing or the way how the results of the work are presented. The authors thus suggest the redefinition of quality from the traditional technical quality to such an expanded definition that concerns also issues as timing or presentation skills (Haywood-Farmer, J., Nollet, J., 1993, p.10). In STOPRO Architects the quality was accordingly to the description of Haywood and Nollet (1993) focus on the technical quality rather than other factors and only recently the focus is also on non-technical definition of quality.

Haywood and Nollet (1993) explains the process of implementation of TQM in professional company as following: the partners have to accept the philosophy of TQM before it will be successful, there has to be a widespread discussion, the management has to convince the professionals about the advantages of TQM and not only tell them that it is the way it will be. In case of STOPRO Architects were identified similar factors as important for the successful implementation of TQM. In the analysis is described a general outline that consist of management commitment that is directly affected by management motivation, expectation and understanding. Furthermore the communication takes place and then the actions. Partners' acceptance of the philosophy can be compared to the management commitment and discussion to the communication as seen in figure 6-1.
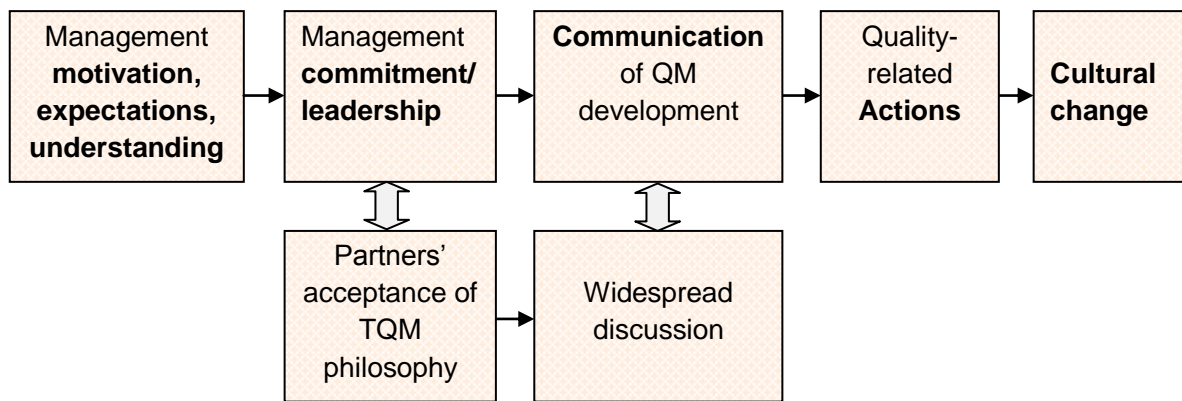
Figure 6-1 Comparison between outline drawn from the case study and literature on professional companies

The investigation of QM implementation process in STOPRO Architects confirmed some specifics that are described in the literature about small and professional companies. Concerning the topics as management motivation, expectations and understanding, management commitment and communication there are some specific issues that are related to the fact that the company is a small and professional. Most of the small businesses are privately owned and the owner is usually the manager at the same time and expert in the field of the business. The owner/manager usually does not have education in how to manage the business. The fact that the owner of STOPRO Architects and also the CEO are expert in their field of work (owner is an architect, CEO is an engineer) affected the way of understanding the QM development and thus affected the whole process of QM adoption.

The factors detected in the case study that were considered as important for the QM development process are management motivation, expectations and understanding, management commitment and communication, and finally after the realization of all the quality related actions, the cultural change should occur. To these factors are associated other factors that are related to the nature of the company as small and professional. These aligned factors are specified knowledge, high degree of training in intellectual skills, use of individual judgement, high degree of autonomy, independent actions, self-motivation, provision of advisory and problem oriented service, identification with and adherence to the standards regarded to the profession or the management that consists of professionals.

6.2   Recommendations

The research was aimed at the contribution to existing knowledge about implementation of QM leading to TQM in small professional companies. The research was done in the small professional company in the Czech Republic that is dedicated to services in design and architecture. On the basis of previous empirical findings and the analysis of the factors that influence the QM implementation leading to TQM, the recommendations can be formulated. The recommendations will be divided in two parts: recommendations for the company itself and the recommendations for the further research.

6.2.1   Recommendations for STOPRO Architects

The company STOPRO Architects stays on the imaginary crossroad. The term crossroad is used with the intention to underline the importance of the decisions that should be taken. The company implemented the ISO 9000 certification in 2005 and since that time several actions were done in order to improve the quality and it is a signal, that the top management already considers quality as an important part of the company's functioning. The question that appears now is whether to follow the TQM route or not and this is a decision that has to be taken by the top management. The aim of this section is to provide some practical recommendations concerning both situations.

If the top management decides for the first possibility which is not to follow the TQM path, the recommendations will consist mainly of following the implications of ISO and put everything that is described in the ISO guidelines in practice. The specific example is that the company should do customer surveys and process the feedbacks as also described in the second part of the recommendations. ISO 9000 series can be considered as a first step to TQM and establishment of such a system can further help in case that top management decides for TQM. According to Samuel K.M. Ho (1993) ISO 9000 series can bring marketing benefits but should be only a beginning of a continuous improvement.

The recommendations for STOPRO Architects in order to pursue the TQM approach are more detailed. The company already implemented ISO 9000 and it is possible to say that TQM and ISO 9000 series are complementary to each other (Samuel K.M. Ho, 1993, p. 87). For the companies that already implemented TQM does not make much sense to apply for ISO but the other way around, the ISO can

be a starting point in achieving TQM. The ISO 9000 should be used as a route to TQM (Samuel K.M. Ho, 1993, p. 87). Based on the data collected from the company and further elaborated in the analytical part, the general outline for STOPRO Architects was created. The outline consists of the crucial factors that affected the process of QM development in the company. The first mentioned factor is the management motivation, expectations and understanding of QM/TQM. This topic is pinpointed because it has a direct impact on management commitment. The management commitment or leadership was not appropriate in case of STOPRO Architects and led in a resistance to change. In case that the top management decides to follow the route to TQM, it is necessary that the management dedicate a special time to understand the philosophy of TQM.

For the company wishing to achieve a TQM stage, few suggestions emerge from this research: (1) The management has to be fully committed to the idea of TQM and to understand the essence of the TQM philosophy. Top management plays an important role in promoting the values in the company and thus when the top management understands the QM; it is easier to convince the subordinates. (2) The rule of top management is to create a shared value of continuous improvement and thus ensure that the value is shared throughout the company. Considering that there are sub groups of different professions presented in the company, the strategies to convince these different professions could also differ. (3) Concerning the specific actions the customer relationships should be improved. From the case study emerges that the identification of customer needs is not done. That coheres with making the customers surveys and feedback process. Even though these techniques are described in ISO documentation, the feedbacks are not done on regular basis and there is no assessment of the results. Concerning the fact that the main focus in TQM philosophy is on the customer, such practices as surveys and feedbacks in order to find out the needs on the clients are critical. This particular recommendation should also be considered in the first situation that consists of no TQM route because it is described in the ISO directions. (4) Concerning the employee's empowerment and involvement, there is a certain disagreement between the employee perception and top management perception of this factor. The suggestion is to involve the employees more in the issues concerning the QM and give them the chance to make their own suggestions for the quality system. The empowerment is described as multidimensional approach that consists firstly of leadership that is aimed on individual development of the members and creating common vision and goals and finally continuous environmental scanning and apartment to it. This recommendation is connected with the recommendations number 1 and 2 that consist of leadership

and creating common value, vision and goals. Connecting the employees' empowerment and involvement with the nature of professionals it is even more needed to involve professionals in the management of the organization. The professionals work satisfaction comes from their individual work more than from the success of the organization and that is why they need strong stake in the process of QM development (Harte, H.G., Dale, B.G., 1995b, p. 47). (5) The training in quality should continue in order to facilitate the cultural change that should shift to total quality culture which would mean that the value commonly shared in the whole company is TQM.

6.2.2 Recommendations for further research

The implementation of QM leading to TQM is a very broad topic to be investigated and there is still lack of literature about the specific group of SPCs. The findings drawn from this research on QM leading to TQM in SPCs are mostly in accordance with the literature that was found on this topic. The outcome can be used for the company itself but cannot be generalized on the whole group of SPCs. The similar research could be done in several SPCs that are in different stages of its TQM development to be able to compare it.

6.3 Discussion

The purpose of the discussion part is to give an evaluation on the whole process of the thesis writing and on the final results of the project in order to make links between the obtained information from the case study and existing knowledge.

The literature study was focused on the four main topics: TQM factors, change management, stage model in QM and the small professional companies. The first mentioned topic is widely described by scientific literature and thus the selection of the literature was done in order to choose the TQM factors that would be suitable for the research in STOPRO Architects. Furthermore the factors in change management were identified from the literature. The literature concerning small professional companies dealing with TQM was also reviewed and the specifics of those companies were identified.

The case study design consists of the description of the data collection techniques. The mostly used technique is the interview. In STOPRO Architects were identified several groups of employees thus the interview was plan to do separately

with the members of top management and with different employees that represent different positions. Each person was interviewed twice, while first interview was focused on the identification of stages, the second one on evaluation of TQM factors in different stages. The interviews went according to the plan and all the respondents were willing to answer all my questions therefore all the necessary information was reached. It would be worthwhile to interview more people in the company but the limitation was that for the research was necessary that employees are in the company since its establishment in order to cover the whole process of the QM development. The questions in a structured interview were focused on the topics described in the theoretical part with the aim of gaining the knowledge about the company's QM development process. The data collection techniques were suitable for the research since interviews and document analysis provided sufficient amount of data to be analysed. The structured interviews were designed for each group of people as top management, employees and Quality manager in order to adapt the questions to the position the person represented in the company.

The empirical part was done in order to summarize the data for the analytical part. The outcome of the analysis is a general outline that comes from the case study and can be compared to the literature about similar companies. The general outline consists of management commitment that is affected by management motivation, expectation and understanding. Moreover the communication and the actions take place and finally the cultural change should occur. For the analysis of these issues additional literature was searched.

The literature about the professional service organizations highlights that topics as the higher level of autonomy or individualism have influence on adoption of TQM. The literature about small companies indicates that in small organizations the owner and manager are usually experts in their field of work and no really trained in leading the business in a first place. The higher level of autonomy or individualism was confirmed during the interviews with the employees that represent different positions and professions. This proved especially during the interviews about the perception of changes in early stages of QM development process. The employees in general did not consider the process of value at the beginning and the professions as architect and engineer proclaimed that the work they did already fulfilled quality requirements which is typical reaction for professionals regarding to quality. The groups of professions investigated in the company were architects, engineers and administrative support. Their general view on QM development process does not differ notably between different positions but it differ between management and employees. The exception in the group of employees form the people who were

directly involved in the QM development process by top management from the beginning. These people tend to demarcate more stages in company's QM development process than other employees and their answers were closer to the top management answers.

The specifics of SPCs were confirmed on the case of STOPRO Architects as of influence on QM development process. The evidence obtained from the case study thus confirms the existing literature about SPCs dealing with QM development process leading to TQM. The limitation of this research is that there was no use of other example of the company that could serve in comparison while evaluating the outcomes.

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Appendices

Appendix 1 Crosby's quality management maturity grid

Measurement Categories	Stage I Uncertainty	Stage II Awakening	Stage III Enlightenment	Stage IV Wisdom	Stage V Certainty
Management understanding and attitude	No comprehension of quality as management tool. Tend to blame quality department for 'quality problems'	Recognized that quality management may be of value but not willing to, provide money or time to make it all happen	While going through quality improvement program learn more about quality management; becoming supportive and helpful	Participating. Understand absolutes of quality management. Recognize their role in continuing emphasis	Consider quality management an essential part of company system
Quality organisation status	Quality is hidden in manufacturing or engineering departments. Inspection is probably not part of organisation. Emphasis on appraisal and sorting	A stronger quality leader is appointed but main emphasis is still on appraisal and moving the product. Still part of manufacturing or other	Quality department reports to top management, all appraisal is incorporated and manager has role in management of company	Quality manager is an officer of company; effective status reporting and preventive action. Involved with customer affairs and special assignments	Quality manager on board of directors. Prevention is main concern. Quality is a through leader.
Problem handling	Problems are fought as they occur; no resolution; inadequate definition; lots of yelling and accusations	Teams are set up to attack major problems. Long-range solutions are not solicited	Corrective action communications established. Problems are faced openly an resolved in an orderly way	Problems are identified early in development. All functions are open to suggestion and improvement	Except in the most unusual cases, problems are prevented
Cost of quality as % of sales	Reported: unknown Actual 20%	Reported: 3% Actual 18%	Reported: 8% Actual 12%	Reported: 6.5% Actual 8%	Reported: 2.5% Actual 2.5%
Quality improvement actions	No organized activities. No understanding of such activities	Trying obvious 'motivational' short-range efforts	Implementation of the 14-step program with thorough understanding and establishment of each step	Continuing the 14-step program and starting. Make certain	Quality improvement is a normal and continued activity
Summation of company quality posture	'We don't know why we have problems with quality'	'Is it absolutely necessary to always have problems with quality?'	Through management commitment and Q-improvement problems are identified and solved	Defect prevention is a routine part of our operation	We know why we do not have problems with quality

Table 0-1 Crosby's quality management maturity grid (Crosby, 1979)

Appendix 2 Critical Factors of QM

Factor 1   Role of top management and quality policy

a: Top management responsibility for quality and profitability
- (1) The extent to which the top executive (responsible for profit and loss) assumes responsibility for quality performance.
- (2) The extent of acceptance of responsibility for quality by major departmental heads within the organization.
- (3) Degree to which top management (top executive and major departmental heads) is evaluated for quality performance.
- (10) Importance attached to quality by top management in relation to cost and schedule objectives.
- (12) Degree to which top management considers quality improvements as a way to increase profits.

b: Quality goals and policy
- (4) Extent to which top management supports long-term quality improvement process.
- (4) Degree of participation by major department heads in the quality improvement process.
- (6) Extent to which top management has objectives for quality performance.
- (7) Specificity of quality goals within the organization.
- (8) Comprehensiveness of the goal-setting process for quality within the organization.
- (9) Extent to which quality goals and policy are understood within the organization.
- (11) Amount of review of quality issues in top management meetings.
- (13) Degree of comprehensiveness of the quality plan within the organization.

Factor 2   Role of the quality department
- (14) Visibility of the quality department.
- (15) Quality department's access to top management.
- (16) Autonomy of the quality department.
- (17★) Utilization of quality staff professionals as a consulting resource.
- (18) Amount of coordination between the quality department and other departments.
- (19) Effectiveness of the quality department in improving quality.

Factor 3   Training
- (20) Specific work skills training (technical and vocational) given to hourly employees throughout the organization.
- (21★) Team building and group dynamics training for employees in the organization.
- (22) Quality-related training given to hourly employees throughout the organization.
- (23) Quality-related training given to managers and supervisors throughout the organization.
- (24) Training in the 'total quality concept' (i.e. philosophy of company-wide responsibility for quality) throughout the organization.
- (25★) Training of employees to implement quality circle type programme.
- (26) Training in the basic statistical techniques (such as histograms and control charts) in the organization as a whole.
- (27) Training in advanced statistical techniques (such as design of experiments and regression analysis) in the organization as a whole.
- (28) Commitment of top management to employee training.
- (29) Availability of resources for employee training in the organization.

Factor 4   Product/service design

a: Product/service design process
- (30) Thoroughness of new product/service design reviews before the product/service is produced and marketed.
- (31) Coordination among affected departments in the product/service development process.
- (32) Quality of new products/services emphasized in relation to cost or schedule objectives.
- (35) Extent to which implementation/producibility is considered in the product/service design process.
- (36★) Extent to which sales and marketing people consider quality as a saleable attribute.

b: Integrating customer requirements
- (33★) Extent of analysis of customer requirements in product/service development process.
- (34) Clarity of product/service specifications.
- (37) Quality emphasis by sales, customer service, marketing and PR personnel.

Factor 5   Supplier quality

a: Supplier selection and relationship
- (38) Extent to which suppliers are selected based on quality rather than price or schedule.

(39) Thoroughness of the supplier rating system.
(44) Extent to which longer-term relationships are offered to suppliers.
(45) Clarity of specifications provided to suppliers.
(46★) Responsibility assumed by purchasing department for the quality of incoming products/services.
(47★) Extent to which suppliers have programmes to assure quality of their products and services.

b: Supplier capability
(41) Amount of education of suppliers by organization.
(42) Technical assistance provided to the suppliers.

c: Partnership with suppliers
(40) Reliance on reasonably few dependable suppliers.
(43) Involvement of the suppliers in the product development process.

Factor 6   Process management/operating procedures
a: Process management
(48) Use of acceptance sampling to accept/reject lots or batches of work.
(49★) Use of statistical control charts to control processes.
(50) Amount of preventive equipment maintenance.
(51) Extent to which inspection, review or checking of work is automated.
(58) Degree of automation in the process.
(59) Extent to which process design is 'foolproof' and minimizes the chances of employee errors.

b: Inspection policy
(52) Amount of incoming inspection, review or checking.
(53) Amount of in-process inspection, review or checking.
(54) Amount of final inspection, review or checking.
(55★) Importance of inspection, review or checking of work.

c: Employees' role
(56★) Self-inspection by workers.
(57★★) Stability of production schedule/work distribution.
(60) Clarity of work or process instructions given to employees.

Factor 7   Quality data and reporting
(61) Availability of cost of quality data in the organization.
(62) Availability of quality data (error rates, defect rates, scrap rates, defects, etc.).
(63) Timeliness of the quality data.
(64) Extent of quality data collected by the service/support areas of the organization.
(65★) Extent to which quality data (cost of quality, defects, errors, scrap, etc.) are used as tools to manage quality.
(66) Extent to which quality data are available to hourly employees.
(67) Extent to which quality data are available to managers and supervisors.
(68) Extent to which quality data are used to evaluate supervisor and managerial performance.
(69) Extent to which quality data, control chart, etc. are displayed at employee workstations.

Factor 8   Employee relations
a: Quality circles
(70) Extent to which quality circle or employee involvement type programme are implemented in the organization.
(71) Effectiveness of quality circle or employee involvement type programmes in the organization.

b. Quality related performance
(72) Extent to which employees are held responsible for error-free output.
(73) Amount of feedback provided to employees on their quality performance.
(74) Degree of participation in quality decisions by hourly/non-supervisory employees.
(77★) Impact of labor union on quality improvement.

c: Supportive structure
(75) Extent to which quality awareness building among employees is on-going.
(76) Extent to which employees are recognized for superior quality performance.
(78) Effectiveness of supervisors in solving problems/issues.

Table 0-2 78 Items for Measuring the Critical Factors of QM (Saraph et al., 1989)