THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Naturalizing Quality Management

– A problem of organizing in processes of change

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Abstract
Naturalizing Quality Management

Various studies have investigated success factors, the effects of organizational contexts, key issues for sustainability, and the financial impact of the quality management (QM) trend in industry. However, few studies of QM in practice build on experiences and data collected as an employee, as well as data collected through interviews after leaving the company. This thesis is grounded in three persons' complementary experiences from taking part in the development at Fagersta Stainless AB (FSAB) between 1984 and 2000: the quality and development manager between 1984 and 2000, an associate professor facilitating the TQM development between 1994 and 2000, and myself as an employed project manager and change leader between 1997 and 2000. During our investigations, one problem intrigued us, concerning the understanding of why principles, practices and techniques become or do not become part of people's natural ways of working. This thesis terms it "the problem of naturalizing quality management".

The purpose of this thesis is to develop an understanding of the problem of naturalizing quality management. Four complementary papers contribute in fulfilling this purpose. The purpose of paper 1 is to describe the evolution of QM at FSAB between 1984 and 2000, in order to gain a longitudinal view of the development and the context of interrelated changes. The purpose of paper 2 is to examine the development of QM in the perspective of ongoing company development processes. The purpose of paper 3 is to elaborate on the problem of naturalizing QM. Finally, the purpose of paper 4 is to develop an understanding of the problem of naturalizing QM.

Quality management is defined as *a matter of constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value-adding principles, practices and techniques.* This thesis suggests that by recognizing the variation in how people are orientating and taking actions, we can develop a shared view that can facilitate the development, application and adaptation of value-adding principles, practices and techniques.

Fourteen modes of organizing – specializing and integrating, 'ideal state' and emergence, conformity and learning, exploration and exploitation, stability and flexibility, procedure and process, 'in theory' and 'in action' – are suggested to be important in understanding the variation in the ways that people are orientating and taking actions in their work. Through these modes, people are addressing new ideas, problems or opportunities in a variety of ways and this creates tensions that may be beneficial or problematic. This thesis proposes that managers and consultants can get better results from an investment and its facilitation if they recognize and act on patterns in the ways that people are orientating and taking actions. A question is how to do so, which is one interesting topic for future research.

Keywords: quality management, change, tension, shared view, principles, practices, techniques, pattern, process, organizing, modes of organizing, making sense, orientating, taking action.

Preface

If I had not been the person I am, with the experiences I have, this thesis would naturally have been something else than what you are holding in your hand. Layers of experiences and thoughts have produced and reproduced the ways that I have attended the task of investigating and writing. I previously worked as a blue-collar worker at Saab and Volvo, before studying towards a Master of Science in automation engineering at Chalmers University of Technology. Then I worked in old-age care during my Master of Science studies, which ended in a master's thesis that was the beginning of consultancy. I worked as a process analysis consultant at Volvo Cars before I became an employee at Fagersta Stainless AB, taking on the challenge of developing total quality management and a QM system satisfying QS-9000. In this work, I also became involved in research, and this thesis is the result of investigating the development at FSAB.

Focusing more on the core of my research process, I want to express my deepest appreciation for you, my supervisor, Sverker Alänge. You have stood by me, challenged me, and stimulated me since we met, almost 15 years ago. During this period, you have been persistent in not giving any simple answers to how I should address the task of doing research. A central theme has been to let me develop something that I "own", and force me to gain my own experiences and develop my own perspective on research. It has been an inspiring journey. You were also the person who put me in contact with Barry Solly at Fagersta Stainless AB.

Barry, you know how much I appreciate all our dialogues concerning quality management and other topics. Thank you for the cooperation in describing the development at FSAB, and for facilitating my development of terminology. It is certainly good to have a native British friend as one is writing a thesis. Next to Barry, I also want to acknowledge the many exciting and stimulating dialogues I have had with you, Eva Axelsson.

To my second supervisor, Bo Bergman: thank you! for many stimulating and challenging dialogues, and for creating an open and friendly environment at the division. I still remember when you quoted Voltaire and advised me that I should not forget that "The perfect is the enemy of the good"; hence beware of the risk of sub optimizing. Do not be afraid of making mistakes, but learn from them. Among other things, I will also remember our ongoing and challenging dialogue concerning process management and improvement.

My third supervisor, José Fonseca, joined my journey of learning, as he was the opponent on my licentiate thesis in the beginning of 2005. In doing so, José, you started a process that led to the core theme of this thesis. Thank you for your guiding words, and for catalyzing the focus of the thesis. One central phrase which will probably always be in my

mind, and which I got from you, is “the illusion of control”. You came from complexity research, which I had considered interesting, but along with our dialogues I think my understanding and way of communicating took new directions. Together, my three supervisors have contributed varying perspectives on my research. These I have had as inputs to making sense of my own, and in communication with others.

In relating to supervision, I would also like to thank Göran Book, who stood by me and read again and again and again, and commented, and commented, and with whom I have shared many exciting dialogues. You were truly an excellent supervisor, professionally speaking, especially during the final work on making it all into a whole. I also want to express my appreciation of Sari Scheinberg, who has been part of my journey for a long time now. Thank you for valuable advice and friendship along the way. You have really challenged me, and pushed me in doing something that I am proud of and that I own.

To my colleagues and former colleagues, besides Bo and Sverker, at the Division of Quality Sciences – Alex, Anders, Andreas, Annika, Eva, Christina, Clas, Ida, Jesper, Lisa, Martin, Per, Peter, Rita, Torben, Yvonne and Åke and Åsa. We have had much fun, many laughs and many stimulating dialogues together.

I also want to send a special word of appreciation to you, Pascal Miconnet, for building the well-structured library of references. The “library” of interesting articles has been standing outside my room at Chalmers, and I have been digging in it now and then. I know how thorough you were in really investigating and selecting theories. Hence, I trusted your judgment and this facilitated my own research process.

Referring, again to my industrial experiences at FSAB, I would like to express my appreciation of my former colleagues at FSAB, besides Barry. I would especially like to express my gratitude to the former president of FSAB, Åke Kronberg. Åke, you believed in me and facilitated the start of research at FSAB; I have also learned much from you regarding the relationship between a board of directors and the operations in a company. Thank you also, Lars Nilsson, for reading and confirming the description of the development at FSAB. Furthermore, without the support of the new president of FSAB, Jan Peters, I would not have had the opportunity to interview, together with Barry, persons at FSAB after I had left the company. Thank you all at FSAB, who have contributed both during workshops and during interviews; no one else mentioned, no one forgotten. Finally, in reference to FSAB, I want to send a special word of appreciation to all of those with whom I cooperated closely at FSAB; you know who you are. In this group I especially include Bengt Glans, who had a major role in the development of the quality management system at FSAB. I think we learned much from each other.

In reference to the final work on the thesis: thank you, Mattias Elg, for giving me such good feedback on a prior version of the thesis. It took more than eight months to go from your comments to the final version. As I think about it, you probably had more positive impact than I can imagine. I think you will see in what ways as you look into the thesis. On this path I also got feedback from Professor Robert E. Cole, who influenced my work from April 2006 until now. I hope and think that Professor Cole can see how much I appreciate his advice, and that I have seriously addressed his comments and advice during our two-hour dialogue on my drafts in April 2006.

Referring specifically to my writing, I want to thank two persons: Jon van Leuven who during some intensive days checked the language of my final work, and Janet Vesterlund who checked the language in papers 1 and a major part of paper 2.

Addressing my family, I would like to thank my parents and friends Kerstin and Göran. My father I have mentioned in relation to supervision, but here I address the core values of our family. I cannot express how much I appreciate your constant support in all kinds of situations. One reason why I have gone into this journey of learning is rooted in all types of conversations and "investigations" into various topics together with both my parents. I remember all the tricky and challenging questions to reflect upon as I was a child, and I can see the same pattern as you are communicating with Albin and Lina.

Finally, but not least, Camilla, Lina and Albin – in the order of appearance – you fill me with the core substance of life, of joy, of happiness. I love you all more than it is possible to express, and Camilla, you have constantly stood by me, providing stability with your loyalty and friendly nature. I have also enjoyed that we have been part of each other's learning journeys.

On the 17th of March, 1996, in Val d'Isère, I had the best meeting possible! It started the most central sub-process of my life.

In my office, at home in Bölet, Mölndal, viewing "our" wonderful nature reserve,

Göteborg, August 2006

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I was thinking a thought; it produced another that produced another.

Then I thought in a new way, but it was a consequence of the old, and of how I viewed my former thoughts in the perspective of the new.

In my new way of thinking, the former thoughts were new; I understood them in a new way, in the new perspective produced by the former thoughts.

So what are new and what are old thoughts, in my thoughts and in my way of thinking and acting?

Written at the beginning of the end of my PhD process, Friday, August 11, 2006, 23:49.

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I Introduction, Central Concepts and Methodology

In this first section, I position and introduce the thesis before describing the problem area and the purpose of the thesis. As part of describing the purpose of the thesis, I also describe the purpose for each of the four papers in section II. Then I give an overview of the contents in the thesis before elaborating on a set of central concepts. The section ends by addressing the methodology of the research. I first give a background and an overview of the FSAB study, before going into the concepts of access, preunderstanding and understanding. Then I describe my methodological stance and approach to research, before addressing the methods of collecting data. Finally, I address four central questions, which I come back to and discuss in section III.

"Often we cannot say what it is that we know… Our knowing is ordinarily tacit, implicit in our patterns of action and in our feel for the stuff with which we are dealing."

Donald A. Schön (1983)

Introduction

During the past two decades, quality management (QM) has been a central theme on many managers' agendas (Cole & Scott, 2000). The emphasis has been shifting and so has the terminology applied in promoting quality-orientated work. A variety of QM models – TQM/TQC variants, National Quality Awards, Process Management variants, Six Sigma, etc. – emerged and were diffused to organizations around the world. These comprise principles, guidelines and methods intended to facilitate the development in all kinds of organizations. Much of the contents stemmed either from Japanese industrial evolution or from experiences in some US companies. In parallel, guidelines and requirements founded on sets of principles have been diffused in QM standards such as ISO 9000:1987, 1994, 2000, QS-9000, and VDA 6. Hence, consultants, managers, researchers and other people engaged in QM were spreading QM models, methods, guidelines and requirements, connected with variants of QM definitions; and they still are.

Various studies have treated QM change efforts in industry and the results of such changes. Some authors, such as Hendriks and Singhal (2001), Easton and Jarrel (1998) and Hanson (2003), indicate that QM as modelled in quality awards, promoting TQM, is likely to render positive developments in a company, while others, e.g. Beer et al. (1990) and Argyris and Schön (1996), claim that the programmatic changes which often prevail in TQM initiatives probably result in no change at all.

Quality management we can see as a philosophy, characterized by its principles, practices and techniques (Dean and Bowen, 1994). However, there is a risk that consultants, researchers and managers view QM change efforts in a too linear sense. They may address change as a series of causes and effects, and if results do not come as planned, such a linear view may hinder development (Stacey, 1996; Fonseca, 2002). In addressing how we define and solve problems, Watzlawick et al. (1974) even propose that searching for the roots of a problem, as part of solving it, may be part of the problem itself;

solutions may instead come as an effect of random circumstances in action. In posing this argument, they share Senge's (1990) view that yesterday's solutions may be part of today's problems. They also share the view of people who are investigating organizations from the perspective of complexity theory, e.g. Stacey et al. (2000).

Professionals interpreting models similar to Lewin's (1948) model of change – Unfreezing-Moving-Freezing – may have reinforced this view. On the surface, Lewin's model may be interpreted in a linear sense; however, as one investigates further, another view appears. Nevertheless, linear thinking, which may have been influenced by interpreting models of change and improvement, might lead to a simplified view of the complex processes of change that occur in organizations. As people orientate and take action they are part of history, within an ever-changing context, which demands a capability of adaptation (Rogers, 1995). Several authors from different fields have recognized these intricate processes of change and some point to the need for a longitudinal perspective in processes of change.

Weick and Quinn (1999), reviewing several studies of change, point at some of the problems in a simplified view of change and propose a shift in vocabulary in studies of change. They suggest that a focus on "changing" instead of "change" can stimulate a greater appreciation of the fact that "change is never off, that its chains of causality are longer and less determinate than we anticipated, and whether one's viewpoint is global or local makes a difference in the rate of change that will be observed…" (p. 382). Van de Ven and Rogers (1988) emphasize the importance of a longitudinal perspective, in studying innovations over time in relation to each other, instead of only studying single innovations. Furthermore, focusing on improvement programmes, Keating et al. (1999) point at the phenomenon that interconnections between different programmes "can create synergies across programmes as well as damaging competition" (p.129).

Considering the above, in order to describe and analyze dynamic processes of change, there is a need to include a broader perspective both in time and in terms of the array of potentially influential factors. This thesis is grounded in such an approach in studying QM between 1984 and 2000 in one stainless steel producing company, Fagersta Stainless AB (FSAB). Quality management is defined as *a matter of constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value-adding principles, practices and techniques.*

A principle may be to focus on continuous improvement, to focus on customer needs, or to always give people a chance to be involved in improvement work that in some way is relevant for their work. A practice may be a certain way of fulfilling principles or solving

problems, e.g. process analysis, Failure Mode and Effects analysis, or Affinity analysis. A technique may be one way of conducting a practice, e.g. process analysis through group processes or through interviews, etc. or following a certain procedure in a specific way in practice. People can develop their specific technique of conducting process analysis or they may follow set-up procedures.

Problem area and purpose

Fagersta Stainless AB is a company with a high quality image and one of the major producers of stainless wire rod and wire in the world. The FSAB operations go back several hundred years and production of stainless steel started in 1921. However, the company was formed in 1984 as a final step in the restructuring of Fagersta AB, formerly one of the major steel companies in Sweden. The company manufactures wire and provides technical support for spring, welding, cold heading, and high temperature applications; and they have core knowledge in metallurgy, rolling and drawing technology. The stainless steel products from FSAB end up in applications in all kinds of industries – e.g. chemistry, construction, automotive, aerospace, health care.

FSAB, like many other companies, has struggled to integrate quality management principles (e.g. customer focus, continuous learning, process orientation), practices (e.g. measuring of customer satisfaction, process analyses, problem analyses) and techniques (e.g. techniques of surveying customer perceptions, analyzing affinities of problems, mapping and analyzing processes) into their business processes. In doing so, they have combined ideas and methodologies for quality-driven business development. However, it was difficult to gain benefits from the ideas and methodologies. Much of QM did not become integrated and natural elements of the business processes. QM-oriented work had a tendency to form its own unique processes, separated from the core business and misaligned with other change processes.

At a seminar in January 2005, the opponent to my Licentiate thesis (Book, 2005), José Fonseca, commented on the described QM development at FSAB (a prior version of paper 1 in this thesis). Fonseca wrote: ”It seems like there is a new religion in the neighbourhood, it requires a new faith … one has to move through difficult litany phases, acquire the rhetoric, the pragmatics, which actually never seem to be mastered … so much training and people simply never seem to be at ease … it never becomes natural …”. Fonseca illustrated a problem that he interpreted in the descriptions of the development at FSAB. Over time, there had been alternating ideas on how to develop the operations at FSAB in the best possible way. Within the QM initiatives, Fonseca thought that he could see “religious” overtones, to which people responded in a variety of

manners. I, however, think that it is quite natural to go through these kinds of phases in development processes, especially in taking on the challenge of developing a new and "total" approach for quality management. Nevertheless, the problem identified by Fonseca was intriguing. How could we understand it?

People at FSAB engaged in dialogues on central principles; they learned about practices for e.g. solving problems and for prioritizing resources, and they practised techniques for e.g. problem-solving and process analysis. However, they often did not seem to develop their own and natural ways of working in developing, applying and adapting these principles, practices and techniques. In reference to this, the ambition of my investigations became to describe and understand this problem of integrating QM, and making it a natural part of everyone's work. In line with this ambition, I formulate the purpose of this thesis as follows:

> *The purpose of this thesis is to develop an understanding of the problem of naturalizing quality management.*

This purpose emerged in an explorative fashion, in line with Ragin (1992: 6), who states "[that] researchers probably will not know what their cases are until the research, including the task of writing up the results, is virtually completed". The writing of four papers (I-IV) contributed to finding and fulfilling the purpose of the thesis. The respective purposes of the papers can be seen as representing different phases of development in my research process:

> *The purpose of paper 1 is to describe the evolution of QM at FSAB between 1984 and 2000, in order to gain a longitudinal view of the development and the context of interrelated changes.*
>
> *The purpose of paper 2 is to examine the development of QM in the perspective of ongoing company development processes.*
>
> *The purpose of paper 3 is to elaborate, conceptually, on the problem of naturalizing QM.*

The purpose of paper 4 is to develop an understanding of the problem of naturalizing QM.

The four papers are different in character and they are the result of four ways of addressing the case of FSAB. Paper 1 is about data and experiences from FSAB, and describes the development of QM at FSAB; it gives an overview of the development. In paper 2 a first step is taken to analyze the development described in paper 1. Paper 3 is grounded in the perceived problem of naturalizing QM at FSAB, but it is a purely conceptual elaboration on the problem of naturalizing QM. In paper 3 complementary theories are brought in to find a "language" that could facilitate the understanding of the problem of naturalizing QM. Naturally, my mind was often on my experiences and data from FSAB, even if it was a completely conceptual investigation. I wrote paper 4 in conjunction with paper 3, but the aim of paper 4 was to work closely with the data from FSAB, and to develop an understanding of the problem of naturalizing QM. In this paper, I took still another step, in line with for example Gummesson (2006) and Kvale (1997: 258), towards using my own subjective experiences and intuition in working with the FSAB case. I was orientating with the aid of my data and experiences, and in numerous dialogues, and I used paper 1 as part of the methodology.

Contents and outline of the thesis

This thesis consists of three sections (I-III) with different purposes. In this first section (I) I position and introduce the thesis, describe the problem that it addresses, and define the purpose of the thesis and the papers. Then I address seven concepts or pairs of concepts, which are central for my way of thinking about QM. The way of describing these concepts has emerged in the process of writing the thesis. Hence, as in the case with the purposes, they are a result of the research rather than driving definitions. As I "understood" these concepts, however, they have been an aid in driving the research towards my way of understanding. Finally, I describe the methodology that has resulted in this thesis. In describing the methodology, I give a background and overview of the study at FSAB before I describe the concepts of "access", "preunderstanding" and "understanding". These three concepts are central in the methodology, and in the following description of my research stance and approach. The methodology ends by introducing four questions that I address after the second section (II), as I initiate the discussion of my contribution and research process in section III.

The second section (II) contains papers 1, 2, 3 and 4. Each paper is introduced by giving my retrospective view on each paper. Hence, the information describes how I view each paper as part of the whole thesis.

In the third section (III), I discuss the contribution and my research process. Then I discuss the implications for research, and managerial implications before ending the thesis with suggestions for future research.

Central Concepts

> *"… One strives for a definition that contributes, somehow, to some understanding… I'm a believer that one doesn't create new definitions, different from the field, unless one can show that it gives added leverage; added understanding … if you can justify the choice, then you have a chance of creating something new and people may be attracted to that."*
>
> Robert E. Cole (2006)

The quote above comes from a dialogue with Professor Robert E. Cole regarding a prior version of this thesis. There are naturally wide arrays of concepts that are part of building a thesis. However, the concepts – Pattern, Process, Organizing and Making Sense, Orientating and Taking Action, Modes of Organizing, Quality Management, and Naturalizing Quality Management, – stand out as the most central in this thesis. These concepts added significant value in developing my way of understanding the problem of naturalizing QM, and I clarify them here to facilitate readers' access to them in reading the whole thesis. Other concepts have been clarified as I apply them in the thesis.

I address the concepts in a thematic manner that represents some type of level of abstraction, and the way that I have applied them in the thesis. In addressing the concept of naturalizing QM, I am applying the concept of QM, In describing QM as seen in this thesis, I apply the concepts of orientating and taking actions, which can take place in any pattern of modes. Depending on the modes of organizing, we orientate and take actions in different ways. Hence, we are organizing and making sense of our current and past experiences in different ways, but we focus on the future as we orientate and take actions. As can be seen, the concepts that I describe in this part of the thesis form a pattern of thinking and talking about quality management. I will conclude this part, after elaborating on each of the concepts, with a summarizing comment.

Before going into each concept, I want to clarify my view on quality. I have a broad view on the meaning of quality, which can be seen in my definition of quality management. I define quality implicitly, in defining quality management. Quality is a matter of fulfilling, and preferably exceeding, customer needs and expectations by developing, applying and adapting value-adding principles, practices and techniques. To fulfil customer needs, but without also fulfilling more profound needs in society, is in my view poor quality management. To earn money on short term, while having a devastating negative impact on the environment, or while engaging suppliers that exploit children, is in my view poor

quality thinking. To me, quality is a matter of having a positive impact in any situation, and in any process, gaining positive influences through products that have positive impacts on people and society.

Pattern

I gradually became attracted to using the concept of "pattern", especially in paper 4, in developing an understanding of the problem of naturalizing QM. An organization and its interactions and activities can be seen in terms of patterns. Fonseca (2002: 77) for example, state that: "The perspective that I take, then, is one in which what we call "the organization" is temporarily "successful patterns of interactions that participants accept as "good enough" to be continually repeated, so becoming organizational habits". Within this pattern, Fonseca expresses how "patterns of talk" that become habitualized may inhibit innovation. According to Berger and Luckmann (1967: 53), "All human activity is subject to habitualization. Any action that is repeated frequently becomes cast into a pattern". Hence, a pattern can be referred to in a similar manner as Jepperson (1991: 145) who defines a pattern as "standardized interaction sequences". However, in my use of the pattern concept, I would also refer to lack of habitualized behaviour or actions as a possible pattern. For example, as an organization is changing constantly, with little stability, I would describe this as a pattern. It may be a complex and moving pattern of changes and minor sustainable structures.

As a group of people is trying to understand a problem or a situation, they may address various patterns that together shape larger patterns. This is often the case as one is analyzing business processes. People involved in activities shape patterns of organizing that we can understand in terms of interrelated processes. While people are involved in developing a medicine or a car, they are contributing to patterns, which influence the efficiency and effectiveness of their and others' work. However, to understand these patterns may be difficult. Referring to Weick (1979: 47), people, as they confront their reality, are elaborating what they see or experience, and they simplify this into interpreted patterns "for the sake of action". Hence, for the sake of action we may construct a perceived pattern, which hides the complexity and results in actions that may result in inefficient use of resources. One example is that it is simple to act on the need for more training in a certain method, but it is more complex to act on the question if training is really the problem. In the first case, we can solve the problem by setting up a training programme; in the second case, we need to go into analysis of a possibly complex pattern.

As Weick elaborates further on the concept of patterns, he clarifies that if you are stuck in a problematic system you should not tamper with single variables. Instead, Weick (1979: 79) states that "patterns and *relations* among variables are the realities that you have to deal with; substances are trivial". Hence, if you want to succeed in change management or continuous improvement, you should address the patterns of variables – ideas, quality of ideas, understanding of ideas, quality of products and services, number of methods, number of trained persons, amount of conflicts, fear of embarrassment, financial situations, etc. There may also be a wide variety of ways to perform a task, and numerous ways of improving the way that we perform a task. How people think and take actions are also variables in this sense. Two persons may, depending on the circumstances and their preunderstanding, react and act very differently to the same suggestion from a third person.

One way of addressing patterns, as indicated above, is to investigate the processes of an organization. To understand a process is a matter of understanding the pattern of activities that together form a system that produces value for customers and other stakeholders. The process concept is quite ambiguous, however, and it needs some elaboration to clarify how I use it.

Process

The process concept is central within quality management. In fact, the year 2000 version of ISO 9000 is explicitly expressed as being founded on a process approach. Various national and international quality awards, such as the Swedish, the European, the US (Malcolm Baldrige National Quality Award) promote process-oriented work. In ISO 9000:2000 and the quality awards, as well as in books (e.g. Rummler and Brache, 1995; Davenport, 1993) such process-oriented work is described in similar ways. In general, process-oriented work is a matter of understanding and managing, interrelated or interacting activities, in terms of flows that transform inputs to outputs. In an organization, this is a matter of systematically understanding, correcting and improving a system of interacting or interrelated processes, and the products, including services, from these processes. This way of directing attention to processes delimits the focus to certain types of business processes. Depending on the systems view, however, this leaves us with an array of interpretations of which processes to address and how (Keen, 1997).

In addition to the above, the process concept can have multiple meanings. Renzhog (1996: 26) states: "the multidimensional meaning of the process concept is clearly a source of confusion". I have had many dialogues concerning the process concept. In this thesis, I refer to e.g. my "research process", to "processes of organizing and making

sense", to "processes of learning and developing understanding", and to "business processes". Hence, I use the concept in a quite generic sense, and it is the context and content of a text, a dialogue, activities or actions that, in my mind, define the meaning of the process concept. After working for more than 10 years with a successively developing process view, I naturally think in terms of processes. This has influenced the way that I write and express myself and the way that I act.

As I refer to the research process, business processes, or the process of organizing and making sense, I indicate a flow or pattern of activities or thoughts that interact or are interrelated. I may refer to the evolution over time or to more frequently repetitious activities in production. I may also refer to a certain dynamic, involving feedback loops that may stimulate growth of awareness and learning. Thus, the meaning of the term process in this thesis must be interpreted in relation to what I address. I emphasize the term to indicate a way of thinking about, and understanding, what and how we think and act – how we orientate and take action.

Even when the process term is not explicitly used, the focus of my mind has often been on processes of various natures. On the other hand, as will be seen in paper 4, I see the orientation towards processes as one of several modes of organizing, in and through which people orientate and take action. The concepts of orientating and taking action are elaborated below after focusing on the concepts of organizing and making sense.

Organizing and making sense

There are several conceptions about organizing, but according to Czarniawska-Joerges (1996: 3966) Weick stands for "the most clear and succinct formulation of a process view". This process view is central in understanding both the research view behind this thesis and central elements of papers 3 and 4. The concepts of organizing and making sense have their own separate meanings. Together, however, the two concepts contribute to a way of understanding how people understand and take actions.

Referring to Weick (1995), people organize equivocal or ambivalent information into patterns that makes sense. They are organizing information and they create meaning and make sense of their prior experiences and the information that they obtain. Weick (1979: 3) defines organizing as "a consensually validated grammar for deducing equivocality by means of sensible interlocked behaviour". Each person who starts to reflect on the meaning of this definition by reading further and communicating with someone is, in this way of understanding, starting to organize. The way that people jointly address, for example, a problem of understanding the meaning of a definition can be seen as one example of "consensually validated grammar".

As people live and work together, they are continually organizing as part of life and work life. The "grammar" that Weick refers to symbolizes the way that we naturally address certain issues or tasks. It is the rules, regulations or codes for behaviour that people implicitly have agreed to follow. Such, grammar expressed in Berger and Luckmann's, 1967) terms can be seen in terms of "habitualized" and institutionalized behaviour. Hence, this grammar is part of our natural ways of analyzing a problem or situation, or our natural way of communicating. We do not think much about this grammar, but it is decisive for the ways that we interact with other people. Through this consensually validated grammar, people communicate, solve puzzles, develop products and processes.

Weick (1979: 3) explains that organizing is a matter of assembling "ongoing interdependent action into sensible sequences that generate sensible outcomes". He uses the term "sense-making", and sees this as "the making of sense" (Weick, 1995). Thus, Weick sees sense-making in terms of a "production" process where people construct meaning together and retrospectively, in gaining awareness of different behaviours, situations, and problems. To take a decision in a certain situation, people would make sense of the patterns and the characteristics of the situation, available facts, intuition, exogenous and endogenous forces, different motivational factors, conflicts, etc. Thus, different factors influence the process of making sense of a situation or a problem. Depending on the patterns that we "create", we vary in the way that we develop understanding. Central in these processes is the ambiguity in what we sense, and this is at the core of the "making of sense".

In daily work, or in taking part in the development of quality management, people are, in this terminology, continually organizing and making sense: in a context of processes; as part of influencing these processes; in taking care of the effects or results of various processes; and as they are actors in various processes. Organizing and making sense is at the core of business processes, and the concepts we can use to indicate the substance of orientating and taking actions. To orientate and take action, as concepts, are however on another level of abstraction. They more immediately direct attention to a process of finding direction and taking action. They are more directed at the future than toward processes of understanding the past.

Orientating and taking action

To "orientate" is a matter of gaining awareness and finding direction. To "orientate", in Merriam Webster's online dictionary, is to "determine one's position with reference to another point" (http://www.websters-online-dictionary.org/definition/orientate). To orientate is thus a concept that addresses the process of finding direction, not the direction

as such. In US terminology, “orient” may be used synonymously. In this thesis, however, I apply the term to address a direction of attention, e.g. a person can be process-oriented, quality-oriented, or result-oriented. Hence, by developing, applying and adapting certain principles, practices and techniques, people can orientate and take actions and successively develop a process-oriented way of working.

The processes of orientating and taking action can be integrated; people are reflective in action (Schön, 1983). They are taking actions while orientating, or they may even take actions as a way of orientating. They may reflect on their own and take actions on their reflections, or they may communicate with another person when orientating together and then take actions. People take action as they hire a consultant for training employees in a certain method. Managers take action as they reduce the personnel by 40 percent; a technical manager takes action in buying new equipment. None of these actions are taken if people are not orientating prior to, or in parallel with, the actions.

In analyzing how people are communicating, they are orientating and taking actions in saying what they find relevant while orientating. As they hear what they themselves and others say, they orientate further and take actions in saying something again and so forth. Weick (30-31) explains that: “the action of saying makes it possible for people to then see what they think … they act and in doing so create the materials that become the constraints and opportunities they face”. Hence, in orientating and taking actions we are creating the environment and circumstances that we then address as we are orientating and taking action again, and so forth. This environment consists partly of more or less persons who independently and together orientate and take actions. We all take part in creating patterns – more or less actively or passively, consciously or unconsciously – of orientating and taking actions; we face other peoples’ processes of orientating and taking action, and we face their consequences.

People are orientating as they are organizing to gain awareness of possible actions. As people take action, they perform an intentional operation with a specific direction found while orientating and while getting feedback from their actions. The key here is “intentional”. In fact, a person may do nothing as an intentional operation, and that could be seen as taking action, for example, to make a statement. To hunger-strike can be another way of making a statement. Taking action may also be to intentionally take a pause and let other people talk, or to let people develop their own way of solving problems. To orientate and take actions in an efficient and effective way can thus be seen as a problem of having good timing. A top manager could orientate and then take action in deciding to, or not to, invest resources in a certain improvement concept like TQM or Six Sigma. Depending on the situation and local conditions in an organization or a group,

different actions may be appropriate. To investigate which ones are appropriate would be a matter of orientating before taking action. A question is how we can develop our capability of having good timing.

Modes of organizing

The concepts of "modes of organizing" or "organizing modes" have been applied in prior research. Edström and Tullberg (1998), for example, explore the reorganization of the Swedish railway and direct attention to what they call two "modes of organizing": administrative and enterprise. They apply the concept in a way similar to that applied by Dunbar and Garud (2005); and the latter authors state that "An organizing mode is a normative orientation that facilitates a particular way of using organizational knowledge. An organizing mode highlights what is significant for an organization". Hence, the authors apply the concept of "organizing modes" or "modes of organizing", pointing at normative orientations that facilitate certain ways of orientating and taking action. I apply the modes of organizing somewhat differently.

Referring to the above, people vary in their ways of organizing and making sense, and this means that they vary in their ways of orientating and taking actions. Depending on e.g. the situation, their personality and their preunderstanding, they interpret, make sense or take actions in a variety of ways. Hence, depending on the modes of organizing, people address problems, ideas, or tasks in different ways. This is similar to the simple fact that people, depending on their mood, whether they are happy, sad, tired, hungry, stressed etc., see the same things differently.

As I worked on the FSAB case, I came to see a pattern in my data and experiences, which I had problems in expressing. After elaborating further to understand the pattern, I developed an understanding of the problem of naturalizing principles, practices and techniques. In my way of understanding, I was addressing how people at FSAB had been orientating and taking actions in various modes of organizing. The way that people were e.g. addressing a new method or an idea, solving a problem and conducting work in general seemed to differ, depending on the modes of organizing in which people were orientating and taking actions. In dialogues, I found an array of possible modes, which gave certain tendencies in people's ways of orientating and taking actions. In paper 4, I illustrate fourteen modes of organizing which I propose as having explanatory power in understanding the problem of naturalizing quality management.

Quality management

Since I was a QM professional before I started my journey of learning how to understand through research processes, I have naturally, and intuitively, been using the term "quality management" for several years. Nevertheless, while elaborating on concepts, while relating them to data from FSAB, and a variety of theories, I developed a new way of understanding QM.

During the past two decades, consultants, researchers and managers have been promoting QM in terms of Total Quality Management (TQM). In this paper, QM is used as a generic term covering all types of quality-related concepts, including TQM, TQ (Total Quality), TQC (Total Quality Control). Bergman and Klefsjö (2003: 34) describe a modern form of QM in terms of TQM as: "a constant endeavour to fulfil, and preferably exceed, customer needs and expectations at the lowest cost, by continuous improvement work, to which all involved are committed, focusing on the processes in the organization". According to Bergman and Klefsjö TQM is a matter of combining values, methodologies and tools to attain higher customer satisfaction with less resource consumption.

Based on my experiences and the study of the QM development at FSAB in its context of constant change, I define QM in reference to Bergman and Klefsjö's (2003) definition of Total Quality Management (TQM) and Dean and Bowen's (1994) view of Total Quality (TQ):

> *QM is a matter of constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value-adding principles, practices and techniques.*

According to Dean and Bowen (1994) the central principles of QM are customer focus, continuous improvement, and teamwork. The customer focus principle is described as being the most important of these three. I, however, do not assign any predefined principles of QM; instead I see it as central that each organization and individual develop, apply and adapt their QM principles. Central in this development is that people in the organization have a well-developed "quality thinking", which I discussed briefly in the introduction, before going into each of the central concepts. As they develop principles, practices and techniques they are guided by their first- and second-hand understanding (Gummesson, 1991: 57-63), e.g. understanding emerging from personal experience, from others' experience, from books, from lectures, and via different methods of access to

others' experience. As people engage in QM, they can constantly develop their understanding. Hence, principles, practices and techniques are developed, applied and adapted; if not explicitly, in texts, this takes place implicitly in the developing understanding.

People develop, apply and adapt principles as a guide in orientating and taking actions. However, they also develop certain principles to satisfy formal quality system requirements and to strive for legitimacy (Meyer and Rowan, 1977). At FSAB, the quality manager described six central principles in terms of "keys to success". These principles we termed: "Customer Focus", "Leadership", "Total Approach", "Continuous Learning", "Process Orientation" and "Standardization for Creativity" as part of a total quality management (TQM) initiative. One example of the contents within a described principle can be seen in the definition of "Customer Focus". One of four points stated that a key is to "Focus on customers' explicit and implicit requirements, need and expectations". By using a set of practices – analyzing processes, collecting customer information, collecting production information etc. people could realize the principles through a toolbox of techniques. To develop these techniques they were guided by methods intended to make the practices efficient. Ackoff (1962), elaborating on scientific methodology, describes techniques as the variety of ways in which certain practices can be conducted; techniques are alternative actions that can be taken.

Techniques may also be seen as related to theory in action, and the know-how that people have in conducting certain practices (Schön, 1983). For example, there are numerous ways of conducting the practice of analyzing a process (Book and Hermansson, 1995); mapping could be on group work, on interviews, on document reviews and observations, or on a mix of such activities. A person who gets the assignment of analyzing a process can progress in this task in diverse ways, depending on available theories for use and the know-how in applying these theories. Hence, the person may apply a variety of techniques in fulfilling the assignment, which was the practice of analyzing a certain process. The person may also be convinced of certain central principles that guide the work, for example the importance of involving people. Such a principle may have emerged from experiences, and may be part of the know-how, but it may also be a more formalized and stated principle intended to guide work.

In summary, QM principles can be to focus on customers, continuous learning, and process orientation. A QM practice can be to measure customer satisfaction, to engage in process analyses, and to systematically analyze and solve problems. Finally, quality management techniques can be ways of surveying customer perceptions, ways of analyzing affinities of problems, and ways of mapping and analyzing processes. By

developing, applying and adapting such principles, practices and techniques we can increase our capability of satisfying customers.

Naturalizing quality management

The terms "naturalize" and "naturalization" are described in Webster's online dictionary (http:// www.websters-online-dictionary.org/definition/naturalization (or naturalize) as a verb with variable meaning. Naturalization is described in terms of a process in which plants spread out into the wild, or in which a person becomes a citizen "in a country other than the one of his birth". The concept of naturalization is even used in the Fourteenth Amendment of the US Constitution – Citizenship rights, ratified in 1868: "All persons born or naturalized in the United States …" (http://www.usconstitution.net/const.html). In this thesis, the concept of naturalizing would also relate to a flower that, through biological processes, emerges in a certain environment, or a flower that is mutated within the environment. The examples above gives only a notion of the concept as it is used in this thesis.

The concept of naturalizing QM captures the process of integrating and making QM a natural part of the organization. Quality management, while being naturalized, is becoming part of the natural way that people communicate and solve problems; QM becomes the natural way that people are fulfilling customer needs by developing, applying and adapting principles, practices and techniques. However, Easton and Jarrel (2000), investigating companies working on TQM, assert that: "Achieving and maintaining world-class systems is not easy and, frankly, not natural". Even if that is the case, to address the concept of naturalizing QM is a matter of addressing how companies can achieve and maintain "world-class" systems in a natural way.

Naturalization of QM is about complex processes of development that include institutionalization. Institutionalization is related to actions that are repeated frequently and which thereby become part of a pattern, which may be disseminated to different types of actors (Berger and Luckmann, 1967). According to Berger and Luckmann (1967), people are relieved of considerable amounts of tensions as an effect of "habitualization" and institutionalization. That is, as people develop certain habits of thinking and acting, and learn "legitimate" behaviour and what works efficiently and effectively, they can cooperate and communicate with fewer conflicts and tensions. We understand each other through our shared ways of orientating and taking actions. This means that we can avoid tensions which could result from misunderstandings and diverging views on reality. However, such tensions fueled by misunderstanding may also stimulate innovation, depending on how people handle the misunderstandings (Fonseca, 2002). Hence, in

addressing the understanding of tensions, QM should not only focus on avoiding tensions; it can also be central to stimulate these to facilitate innovation and improvements.

Relating to the definition of QM, three central findings can be extracted, which are relevant in conceptualizing the problem of naturalizing QM. To naturalize QM is a matter of developing, applying and adapting principles, practices and techniques that can result in:

1. cognitive constructions and normative rules which are carried out through and shaping social behaviour, and which reduce problematic tensions;
2. values and behaviours that persist over time, but which are open for change;
3. efficient and effective patterns of organizing, which induce tensions that stimulate innovation and improvement.

To naturalize QM influences the processes of organizing and how these processes are shaping and reshaping the organization. It influences the interrelated business processes and the organizational structure in which people are orientating and taking action. The naturalization takes place through complex and adaptive processes, evolving in a flux of endogenous or exogenous influences.

Some organizations grow from a natural way of conducting QM; it is part of their natural principles, practices and techniques. Hence, QM grows endogenously as part of the development of an organizational culture. Other organizations try to adopt principles, practices and techniques from second-hand knowledge. Such second-hand knowledge may stem from books, courses, listening to others' experiences etc. (Gummesson, 1991). Referring to Schein (1985: 19), the development of an organization's culture can be seen as taking place through the development of the "capacity to survive in its external environment and to manage its own internal affairs". As indicated, such development is related to the processes of permanent transformation, which in turn are related to technical, social, political, cultural and other dimensions of change. Such transformation and change take place within an organizational structure, in conjunction with influences on this structure.

Summarizing comment

The concepts addressed above give together an overview of the definition of QM and the problem of naturalizing QM as described in this paper. The concepts together open up for a way of understanding quality management and its purpose. They are somewhat overlapping in their meaning, but together they add layers of perspectives constructing a whole that would be different if one of the concepts were taken away. Jointly they form a terminology that can deepen the understanding of the QM definition: *QM is a matter of constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value-adding principles, practices and techniques.*

QM is a matter of constantly orientating and taking actions because the patterns in an organization are continuously changing. We try to interpret these patterns for the sake of actions, and in doing so we are organizing and making sense of what we read, hear, see, and of the processes that we take part in or observe. The concepts of organizing and making sense give a basic notion of what goes on as we understand patterns or as we "make" patterns for the sake of action. Hence, the biggest overlap in meaning is between the concepts of "organizing and making sense" and "orientating and taking action". "Organizing" and "making sense" are concepts that direct attention at understanding past and current situations. They are concepts that address the subtle and cognitive processes of understanding. The concepts of orientating and taking action, however, address the more concrete ways that we are trying to find direction and take actions. These concepts direct attention more at the future than at understanding the past, even if the search for understanding of the past can be a way of orientating.

I have addressed a selected number of concepts which I found relevant to introduce in this introductory part of the thesis. There are, however, fourteen concepts which are also as central as the above, and are elaborated as the central theme in paper 1 – "Modes of Organizing in Quality Management: A way of understanding". The concepts address fourteen modes of organizing. Paper 1 proposes that people at FSAB were orientating and taking actions in the following modes of organizing: specializing and integrating, 'ideal state' and emergence, conformity and learning, exploration and exploitation, stability and flexibility, procedure and process, 'in theory' and 'in action'. This does not mean that people were not in other modes. The central theme of the paper is to develop a way of understanding, not the exact way of understanding.

Methodology

> *"I am getting increasingly impatient with those who advocate more rigorous testing of fragmented detail – pretending complexity and context can largely be disregarded – and only marginally sensitive to the systemic whole, the network structures and processes of life, the dynamics and the phenomenon of emergence, and not least individual and collective dimensions of researcher persona and its researchscape"*
>
> Gummesson, 2006

In reference to management research in general, Gummesson (2006) argues that much of the research disregards complexity, context and persona ("the human and social aspects of researcher behaviour"). Gummesson calls the researcher environment a "researchscape", indicating a metaphorical reference to the concept of landscape. I believe that I have been recognizing all three of these factors, and I have continually reflected on my "researchscape", together with colleagues and other central persons who have been part of my researchscape. Regarding sensitivity to "the systemic whole", I have been thinking in terms of systems since my father, mother, and I started to reflect on patterns of organizing approximately 25 years ago. Both my father and mother took courses in "systemic family therapy". For the past ten years, I have been developing my grasp of how to understand systems of activities in terms of interrelated processes. I am sure that, if fortunate, I will continue to do so during the coming 25 years as well.

In this part, I use some of the concepts that I described in the previous part, "Central Concepts". It contains an overview of the methodology. I first describe the background and give an overview of the FSAB study. Then I clarify the concepts of access, preunderstanding and understanding, before discussing my methodological stance and approach. Finally, I present the methods in collecting data and four questions that I will address in the final discussion after section II containing the four papers. A more substantial description of the data collection is provided in paper 1, and a more substantial description of the whole research process is given in paper 4.

Background and overview of the FSAB study

In 1996 I was involved as a consultant, facilitating process analyses at Volvo Cars in Torslanda. I was constantly trying to understand the processes in which I took part, and

the processes that we addressed during the analyses; and that was the background for a growing interest in doing research. I expressed to associate professor Sverker Alänge at Chalmers University of Technology an interest in doing research that could deepen my understanding of process-oriented development. I wanted to understand better in order to be able to facilitate process-oriented development work in a better way.

There was no possibility at the time, but in the spring of 1997, Alänge (who became my supervisor in my research process) recommended me for a challenging job at Fagersta Stainless (FSAB). Alänge coordinated the TQM training at FSAB and personally took part in training all managers and other employees as part of the TQM implementation at the company. He was involved as a TQM advisor from 1994 until 2000 and collected substantial documentation during this time. The QM development took place in a context of parallel projects, financial fluctuations, restructures, changes of leaders, and multiple models for development.

In May 1997, the quality and development manager at FSAB, Barry Solly, hired me as a project manager responsible for leading the company to a QS-9000[1] registration. For slightly more than three years (1997-2000) I was an employee, and I used the opportunity to gain extensive access to data on the QM development. However, I was in the middle of central projects and had operative responsibilities that I prioritized, so I did not write anything or conduct any analysis until after my FSAB period. I took notes, but in a rather fragmented way, due to the fact that I most often had an operative role in the development. I was constantly involved in communicating with a variety of persons, in a variety of situations. In fact, this communication has continued during the years after I left FSAB, and my way of viewing the development has changed along the way.

I was involved in the strategic TQM work, facilitated various workshops and took part in the planning and execution of management training and staff training. Furthermore, for approximately half a year during 1998 I was part of the steering committee and project management in the implementation of an Enterprise Resource Planning system. From 1998 until 1999, the president, Solly, and the personnel manager and I had regular informal reflective meetings – "VU-träffar" (business development meetings).

During my work at FSAB, I became involved in a study of process-oriented improvement at Chalmers University of Technology, which was finalized as the first step after leaving FSAB (Alänge and Book, 2001). Then I was involved in a larger survey study of

[1] The QS-9000 requirements established in 1994 were the result of a six year long process of harmonizing the American automotive industry's quality system requirements and assessment tools. These requirements were diffused to the North American suppliers and subsequently to all Ford, Chrysler and GM suppliers in the world. The foundation of the system was ISO 9001:1994.

improvement work in Swedish health care (Book et al., 2003; Olsson et al., 2003). In parallel, I worked more or less intensively with the FSAB case. I had the opportunity to cooperate with Solly, who had been the quality and development manager since the formation of FSAB in 1984. As he had left the company, he had time to devote to the investigations of FSAB data. In fact, he was taking the last year of Gestalt training with a focus on organizational development, and as part of this programme he tried to understand on a deeper level his experiences at FSAB.

Solly was employed by Fagersta AB in 1974, after earning his Ph.D. in materials science and working in stainless steel development for some years in the nuclear industry. Until 1984, he was involved in research and development, technical market support and process development at Fagersta AB. During the final phase of a major restructuring of Fagersta AB, Solly was the manager of technical market support and process development. He became the Quality and Development Manager of FSAB, when the company was constituted in 1984; in this role, he was part of the top management team from 1984 until 2000.

The goal of the study at FSAB was, from the beginning, to develop successively an understanding of how to gain the best possible yield from quality management at FSAB. The intention was to work internally at FSAB and to gain benefits from the developing understanding in research and practice. The idea was that the research process and the process of developing FSAB would influence each other in positive ways. Hence, from the beginning my interest and financial motives both were driving the research. The president had a long-term business focus in letting me do research. However, in the end of the 1990s FSAB was in financial difficulties. Even though FSAB had previously shown substantial improvements in results, the board of directors changed president.

One of the first measures by the new president was to change the QM strategy completely. Instead of “traveling” further on a journey of developing a “total approach” for QM, the new focus became more defensive quality assurance and on keeping certificates. Our aim had been to integrate QM in every part of the organization, as a strategy for business and operational development; now the president reduced QM to basically being the responsibility of the quality department. I can see the logic in these measures, given the preunderstanding that the new president had of QM, and given the available data on the financial effects of substantial QM investments. In the situation of FSAB the president needed to present more concrete measures to the board of directors than further investments in TQM.

The new president let me and Solly continue the study of QM at FSAB, but we were no longer active participants in the development. We were among those who left FSAB in a personnel reduction. From my perspective, it was quite an interesting experience to be part of the personnel reduction, since I normally look forward. My friends joke about my motto that usually shows during communications: “This was probably the best that could happen”. Normally I view the advantages of situations in retrospect after leaving behind possible initial frustration or other feelings. This I mention to clarify that the continuing investigations into the QM development at FSAB were not driven by frustration or striving for “revenge”. Instead, I had a positive feeling about the new president, who was also one of the persons that we had a chance to interview.

Together with Solly I continued my journey of trying to understand better what was central in gaining the best possible effects from QM and how to understand the development at FSAB. We had many dialogues and investigated data to develop our understanding of QM at FSAB, with a special focus on the context of other ongoing company development and events. In cooperation with Solly, I described the development of QM between 1984 and 2000 first in Book and Solly (2004) and then in a revised version, which is paper 1 (Book and Solly, 2005) in this thesis. The paper gives an overview of the QM development at FSAB between 1984 and 2000, with an emphasis on the managerial initiative over time and on exogenous and endogenous forces in the development. In paper 2, I tentatively analyze the development, indicating various issues that we found interesting in the FSAB case.

The analyses and discussions in papers 2, III, and IV are influenced both by the process of writing paper 1, and by the contents of this paper. In fact, the latter comment is relevant for the process of writing this whole thesis; the process of writing has been central in making sense. Paper 2 takes a stance in paper 1, and this paper brought up one point that was the first step towards the purpose of this thesis. The paper proposes that as we engage in QM, we should drive for an “invisible success” where QM becomes “invisible” and totally integrated in the business processes. Then, in working on paper 3, I took a step away from the FSAB case, and elaborated the problem of naturalizing quality management in a general sense. Finally, in working on paper 4 I went back to the original data, to illustrate the fourteen modes of organizing which are suggested in this thesis. These modes of organizing were identified while making sense of what had happened at FSAB. In this final paper, I also went back and interpreted and analyzed what I had described together with Solly in paper 1. Paper 4 can be seen as constructing a terminology or conceptual framework for communicating and developing understanding about the problem of naturalizing QM. I call it a “grammar of modes”, and it can be used in developing understanding of quality management.

The concepts of access, preunderstanding and understanding

To describe the methodology of this thesis, three concepts – access to reality (data), preunderstanding and understanding – are central. Gummesson (1991, p. 11) identifies the work to gain "access to reality", that is, the "opportunities to find empirical data (real world data)", as a researcher's and a consultant's number one challenge. The number two challenge Gummesson (p. 12) identifies as "Preunderstanding and Understanding".

There are various sources that can contribute to the growth of understanding. Gummesson (1991) describes the contributing sources, and divides these into two basic categories, first-hand and second-hand, see Figure 1 below.

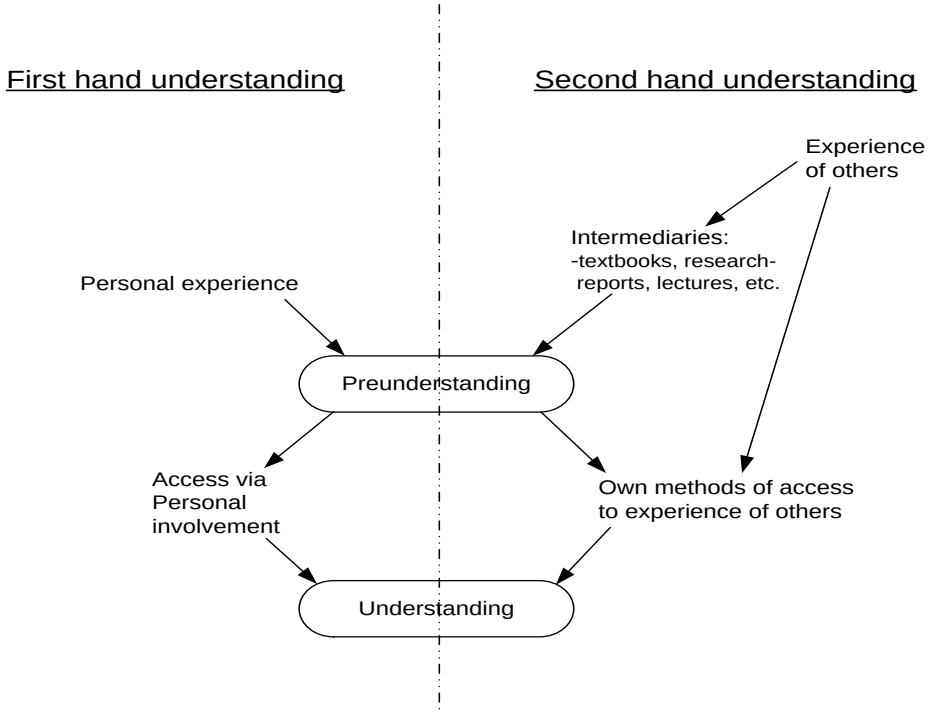

Figure 1 The sources of preunderstanding and understanding, at first and second hand, and their relation (inspired by Gummesson, 1991, pp. 57-63)

Knowledge from first-hand preunderstanding is founded on the individual's own experience and preunderstanding during personal involvement in a research project. Knowledge from second-hand preunderstanding is founded on others' experience, which is communicated via different intermediaries and is then combined with the direct access to others' experience. Access is, as described above, defined as the number one challenge in research, and it "refers to the ability to get close to the object of study, to really be able to find out what is happening" (p. 21). Thus the methods of access to others' experiences

are important in developing second-hand knowledge, but also in gaining first-hand experiences from involvement and developing first-hand knowledge.

Preunderstanding in Gummesson's terminology "refers to people's insights into a specific problem and social environment before they start a research program or consulting assignment; it is the input" and understanding is "the insights gained during a program or assignment; it is the output" (p. 12). A combination of one's own personal experience – in daily private life as well as in professional life – and of others' experience influences the preunderstanding, which in turn influences the growth of understanding during, for example, a research project. Others' experience is communicated via different intermediaries and via methods of access that we can apply because of our preunderstanding. These methods facilitate the analysis and interpretation of others' experience and, hence, contribute to the ability to learn from others.

To illustrate the progression of understanding Gummesson refers to the hermeneutic spiral and explains, "We take a different level of preunderstanding to each stage of the research" (p. 61). To use the spiral is a way of visualizing the development of understanding through feedback loops that continuously are developing. Even Shewhardt (1939), one of the key persons in the quality management field, indicated that the growth of understanding could be beneficially understood in terms of a spiral.

I also use the spiral in visualizing development; however, I believe that it is more complex than spirals indicate. There is a risk that we believe that we are not linear in our way of thinking, and hence looking at cause-effect chains, just because we view development in terms of loops or spirals. Loops and spirals, in fact, are also built on the notion of small steps of cause and effects. This suits well our "rational" ways of thinking and acting, but in my view the development takes place in more complex processes. Nevertheless, I acknowledge the "spiral" as a metaphor for a successively developing understanding.

Methodological stance and approach

In Easterby-Smith et al. (2002) I found a table that in a simple way facilitated an initial positioning of my methodological stance; see Table 1. They pose the question "how do we know that it is valid? Then they go on to discuss different viewpoints in research.

	Positivist	Relativist	Constructionist
Validity	Do the measures correspond closely to reality?	Have a sufficient number of perspectives been included?	Does the study clearly gain access to the experiences of those in the research setting?
Reliability	Will the measures yield the same results on other occasions?	Will similar observations be reached by other observers?	Is there transparency in how sense was made from the raw data?
Generalizability	To what extent does the study confirm or contradict existing findings in the same field?	What is the probability that patterns observed in the sample will be repeated in the general population?	Do the concepts and constructs derived from this study have any relevance to other settings?

Table 1 Perspectives on validity, reliability and generalizability (Easterby-Smith et al., 2002: 53).

Easterby-Smith et al. (2002) show that the "technical terms" validity, reliability and generalizability vary in meaning depending on the viewpoint in research – positivist, relativist or constructionist. I have indicated in my papers that the research presented in this thesis belongs in the third column; it is on a constructionist viewpoint. However, I have indicated this by referring to hermeneutics (Alvesson and Sköldberg, 2000) in combination with Weick (1989), Pool and van de Ven (1989), Gummesson (1991) and Dahlbom (2002) in my papers.

For a long time I avoided addressing my research in terms of validity, reliability and generalizability. This was due to reading Yin (1994) who according to Easterby-Smith et al. represents a relativistic viewpoint. Yin posed arguments for case studies which I found relevant but also annoying. Eisenhardt (1989) posed the same type of arguments, promoting multi-case research as the way to contribute. I could and can see the value of multiple case studies, but I did not agree on their argumentation in comparison with single case studies. I thought that they had a type of "quantitative" argumentation in addressing qualitative studies. However, in positioning my research in the column in Table 1, the terms – validity, reliability and generalizability – are "valid". This is in line with Gummesson (1991), who argues that the assessment of research must be adapted to the point of view claimed by the researcher and the type of research, conducted.

Referring to column 3 in Table 1, in the investigation of FSAB, I have focused on using my access to my own and others' experiences from the research setting. I have also focused on being transparent in how I collected data and how I made sense of the data. In my case, I have made sense of the data in a dynamic process of communicating, listening to taped interviews, reflecting on my own experiences and organizing my data in a longitudinal order. In the beginning, I tried more to separate myself from the investigated phenomena, but later I adhered to those who argue that this is not relevant in my type of research, e.g. Gummesson, (1991) and Easterby-Smith et al. (2002). Instead, the central challenges are to gain access to data and to develop a substantial preunderstanding of the studied phenomenon, and the context, in which the study takes place (Gummesson, 1991). I have used my preunderstanding, and access to data and my own experiences, from FSAB in developing concepts and constructs. I believe the developed concepts and constructs can be used in addressing many types of problems.

To position my methodological stance further in constructing this thesis, I will briefly contrast this thesis and the research methodology with another thesis, Gravesen (2002). I interpret Gravesen as having an interest similar to mine, but the methodological stance is somewhat different. Gravesen addresses the question: "How do the improvement processes in companies actually operate and what is the driving force behind them?" The objective of her study is "to contribute to understanding how improvement processes work and what drives them". In addressing the research question and objective, referring to Table 1, Gravesen can be interpreted as a relativist or constructivist. The focus on how improvement processes "actually operate" I interpret as a question that gives a feeling of the point of view of a relativist. On the other hand, in reading the descriptions of methodology, including her view of science, I can see more of a constructivist research view. She states (p. 326) "We move in many different realities that are the objects of continuous construction and reconstruction via interaction between people … whose interpretation is true and why?"

In viewing Gravesen's thesis, which I truly appreciate, I see that she illustrates in detail the views of people in the three compared objects of study – ABB Infosystems, Ericsson Cable Telekabeldivisioinen, and Xerox. She focuses on what is taking place over time and during meetings and visualizes the improvement processes in each object of study. Then she analyzes the patterns in the processes and comes to conclusions on central characteristics of the improvement processes. For some time this was also my intention, but I set this idea aside and instead gave an overview of the development and went into a "varied" investigation strategy.

Since I had been part of the company, I had also seen the many different views of the development, which also Gravesen (2002) does, but regarding another type of access. In my case, I was investigating my experiences in relation to prior development in the company, and in relation to former colleagues' narratives. I would have been one of the persons that Gravesen would have interviewed or communicated with in applying her research approach at FSAB. I had been involved in leading staff and development programmes as an employee at FSAB. Gravesen was also involved and close to the companies, but she never became a native. In my case, I was driving central projects and had an operative role during meetings.

As I had been part of the development at FSAB, I could see many variants of interpretations and possible focuses that would be central to address in order to give a good picture in detail. I nearly "drowned" in all of the impressions and possible interpretations, and in the thought of covering all the intricate organizing, that belonged to the whole. Instead, I focused on giving a longitudinal view, without going much into details on interacting people and the many views on the development that existed. After describing the development over time, I used the views of people that I had recognized in developing my preunderstanding. I was trying to investigate the patterns of development in a more intuitive manner, using dialogues with Solly and Alänge. I started to construct a way of thinking about the development at FSAB rather than looking for patterns in the actual data. I was looking at the data, but I concentrated on what could be seen "in between" the data. Hence, I was making sense of the data and in this way I "constructed" a pattern from my data and preunderstanding.

I filled in gaps with my own intuition in dialogues with Solly and Alänge, and then I conceptually elaborated on how to understand the problem of naturalizing QM. In combination with this, I "designed" a way of thinking about modes, involving the data from FSAB but, most of all, the whole process of trying to understand the development at FSAB. To me it is natural to state that I have produced this thesis in a "" approach to research. In the beginning of the research process, before my licentiate thesis (Book, 2005) I was searching for my stance. On the other hand, in line with Gummesson (1991) I am sure that I could also do research from another point of view (paradigm). This is where the process led me this time, and thus I will not claim that I am a "constructionist", but I created the thesis in a process that is well in line with the criteria for validity, reliability, and generalizability, from a constructivist perspective, as described by Easterby-Smith et al. (2002).

The thesis is the result of a learning process, following the hermeneutic research tradidion, or rather some general traits of this tradition, as presented in Alvesson and

Sköldberg (2000). According to Alvesson and Sköldberg, there are divergent views in the hermeneutic research tradition, but there are some common traits, "Chief among these is their emphasis on the importance of *intuition* (p. 52). In line with Strauss and Corbin (1990), I have investigated data from different perspectives, while going back and forth between data and theory; hence, I have had an abductive approach in my research. I have searched for patterns that could aid the development of understanding the problems in gaining the best possible results from QM investments. This search led to a focus on developing a type of "grammar" for understanding the problem of naturalizing QM. Hence, my research emerged into focusing on setting up a structure of concepts, from which we can communicate about the problem of naturalizing QM.

The thesis is grounded on the single study of the development of quality management at FSAB. In Eisenhardt's (1989) "roadmap" for building theories a single case is not enough to generate theory. Furthermore, Eisenhardt suggests that a first step should be to define the research question and focus, and even constructs, so that the researcher does not get "overwhelmed" by the data. Dyer and Wilkins (1991) give a rejoinder to Eisenhardt's suggested approach. They express a worry that the suggested approach may lead to problems in the theoretical progress. One of Dyer and Wilkins' arguments is that classical case study research is often founded on single case studies, and on a more process-oriented and context-oriented view of how to find the research focus and understanding of data. Gummesson (2006) also argues that if the case is rich enough there is much to learn from a single case. I am among those who believe that there is much value in investigating a single case.

The FSAB case offered an opportunity to gain a longitudinal view of a complex change process. Initially, however, it was problematic to see what to focus on in the FSAB case. This is not unique; Ragin (1992, in Ragin and Becker, 1992) refers to the question "what is a case?" and states that:

> *"Strong preconceptions are likely to hamper conceptual development. Researchers probably will not know what their cases are until the research, including the task of writing up the results, is virtually completed. What it is a case of will coalesce gradually, sometimes catalytically, and the final realization of the case's nature may be the most important part of the interaction between ideas and evidence" (p. 6)*

In this perspective Eisenhardt's (1989) argument that it is important to find a research focus and even define constructs in the initial stage of a case study may be questioned. The risk in such an approach is that a researcher gets stuck in preconceptions that could overrule further understanding. If we establish the constructs and research focus in the beginning of a study, this may hinder deeper understanding and our access to new ways of making sense of the case. From a practical point of view, focusing on publishing, I can understand the argument, but from a learning perspective I find Eisenhardt's argumentation problematic. In my perspective, one of the central contributions from a single case study may be a conceptualization which can facilitate communication on a certain problem. It all depends on the case, but conceptualizing the problem of naturalizing QM is central in this thesis.

The focus and the concepts in this thesis emerged through the investigations, instead of being set in advanced. This may seem an odd way of doing research, but in practice we all know less in the beginning of a study; our understanding of a case, and how it can contribute, emerges over time, if we are not stuck in our preconceptions. Dahlbom (2002) maintains that organizational studies should be seen as an artificial science. This type of studies, according to Dahlbom, should be directed at constructing something sensible that can be used, rather than understanding exactly what a certain phenomenon is about. My preconception in the FSAB case, has been much in line with Dahlbom's line of reasoning. I have tried to construct something sensible that can develop our understanding of the problem of naturalizing QM.

Methods in collecting data from FSAB

During the period 1994–2001, Alänge first and then I, collected a wide range of data, mainly qualitative. I decided not to emphasize quantitative data, even if I understand that some researchers and managers would like some type of quantitative analysis. In line with Gummesson (2006), I have been sceptical of using quantitative data in my study. I organized substantial parts of the documentation in chronological order to facilitate a longitudinal interpretation. In summary, the data came from strategy documents, offerings from consultants, planning documents, minutes from meetings and notes from meetings, and from 23 explorative interviews with top and middle managers, operators, union officials and consultants. (See paper 1 in section II.)

Together with Solly, I conducted the interviews more than half a year after we had left the company. The interviewees covered all the areas of the company and different aspects of the developmental work. Nineteen of the interviews were digitally recorded. However, both Solly and I also took notes and made reflective comments during the development.

Thanks to the digital format of the approximately 80 hours of recordings, it was possible to find easily descriptions of certain phases or matters in the interviews, and to go back to the interviewee's narratives. Selected parts of the interviews were transcribed.

Combined information from three types of data sources contributed to the description of the QM development at FSAB in paper 1, see Table 2. Firstly, various kinds of verbal communication explicitly or implicitly influenced the study and paper 1. Secondly, Solly and I explored different kinds of FSAB in-house information available in various documents; and finally, diverse sources of external information have also been used for specific purposes. For example, external information on QS-9000 contributed to the description of a certain phase of development at FSAB.

Verbal Communication	FSAB Documents	External Information
Internal FSAB conversations with operators, office staff, middle managers, top managers	Programme Documentation from management and staff training	ISO 9000:2000
FSAB Communication with Customers	Project management Documentation	QS-9000, third edition
Communication with External auditor	Minutes from meetings	Information Concerning the Steel Industry and FSAB
Retrospective interviews, taped in digital format	Internal Company Magazine (Stålringen)	Information Concerning the Local Area of Fagersta
Retrospective Continual Communication with the Q&D Manager, Solly	Information from customers	Researcher's documentation of TQM at FSAB, including distributed internal FSAB documentation
Retrospective Continual Communication with Alänge	Reports from audits	Kinde and Lindström (1999) on the QS-9000 development in Sweden
Retrospective communication with president who left the company in 1999	FSAB contracts	

Table 2 The data sources divided into three types of origin (from paper 1)

As can be seen in Table 2, we used a number of sources in combination to describe the development. Together with Solly, I investigated the data until 2003. Then I wrote the Case Report, while organizing the data for a year in recurrent interaction with Solly and

Alänge. They both were engaged in various communications to facilitate the presentation of different parts of the development. Solly read, assessed and commented as part of a final collaboration and finalizing of the report. Finally, the quality manager Lars Nilsson, succeeding Solly, who had also been involved at FSAB for decades, read the report and found no discrepancy with his view, given the described delimitations.

Four central questions

I have given an overview of the methodology by which this thesis was produced. In the next section are the four papers, which constitute the core of the thesis. In the concluding section, after the appended papers and the comments on these, I will come back to the methodology in a more reflexive sense (Alvesson and Sköldberg, 2000). That is, I will reflect on the contribution and the methodology in relation to my research process and learning. In doing so, I will come back to four central questions, which I have asked myself repeatedly during the last five years. I did not realize that I posed these questions until I read them in Gummesson (2006); he suggests that researchers, involved in management research, should ask themselves:

1. Do I address pivotal issues in research in [quality] management?
2. Do bureaucratic restrictions or entrepreneurial initiative and curiosity control my choice of problems to study, the methodology I apply, and the analyses and interpretations I make?
3. Does my research exert any impact and add value to people, organizations and society?
4. Do I believe, on the whole, that what I am doing is the right thing for me to do?

My answers to these questions have shifted along the way. In the concluding part, I will give my current view after going through the “training camp” of learning how to do research that is valuable to me, and hopefully to others.

II The Four Papers

This section contains the four papers. I introduce each paper in a retrospective comment on how I view it in the perspective of having written the whole thesis.

The purpose of paper 1 – "*16 Years of Quality Management Evolution in a Company: The Case of FSAB*" – is to describe the evolution of QM at FSAB between 1984 and 2000, in order to gain a longitudinal view of the development and the context of interrelated changes.

The purpose of paper 2 – "*Quality management from a Company Development Perspective: The complexity of a change process*" – is to examine the development of QM in the perspective of ongoing company development processes.

The purpose of paper 3 – "*The Problem of Naturalizing Quality Management*" – is to elaborate on the problem of naturalizing QM.

The purpose of paper 4 – "*Modes of Organizing in Quality Management: A way of understanding*" – is to develop an understanding of the problem of naturalizing QM.

Paper 1

Sixteen Years of Quality Management Evolution in a Company

The Case of FSAB

Revised version

Stefan Book & Barry Solly

In this paper, I cooperated with the former quality and development manager at FSAB – Barry Solly. We give an overview of the development of quality management (QM) at FSAB. It contains descriptions of the roots of FSAB going back to the 12th century in the early days of mining until the end, in 2000, of a "TQM period" that started in 1994. FSAB was constituted in 1984 as the final step of a major restructure of Fagersta AB.

With a few exceptions – some top managers and consultants – the paper does not go into detail on how specific persons were expressing themselves or acting. The focus is on giving a longitudinal view of the development of QM in its context of parallel processes of change and projects. The paper describes this development, and how people reacted to the alternating QM initiatives taken over the years. It also gives a view of FSAB as within a major pattern of financial fluctuations and the development of international and standardized requirements

The work on this paper and subsequent dialogues on what we can learn from the FSAB experiences led to the focus of this thesis. In writing this paper, a process started that led to the other three papers. After writing papers 2, III and IV my understanding of the development changed; and I understand it in other terms now than when I wrote this paper.

Abstract

The purpose of this paper is to describe the evolution of quality management (QM) at Fagersta Stainless AB (FSAB) between 1984 and 2000 to gain a longitudinal view of the development and the context of interrelated changes. At the centre of attention are the managerial initiatives and their character over the years, viewed from the perspective of prior and parallel development. The case exemplifies a complex mix of initiatives and changes that took place in the context of business cycles, restructuring, parallel internal change projects, and replacements of presidents.

The paper covers a small slice of the development, but it is a slice that can be seen as representing the more complex developments over time in a company. We took part in these complex developments as employees at FSAB. During the period 1994 – 2000, we gathered substantial data from the development, and, after we left the company in 2000, we interviewed 23 persons with the aim of better understanding QM development at FSAB. Hence the description is founded on substantial access to data and a well developed preunderstanding of the operations at FSAB and the development of QM in this company.

The description starts with an historical overview of the development of FSAB, and we then trace the QM development over time until FSAB entered still another QM phase in conjunction with a change of president. This was the fourth president since the constitution of FSAB, which was the last step in the restructuring of Fagersta AB operations. The change of president took place in the third major financially turbulent phase during the period 1984 – 2000. One thing that is clear from the case is that, if we want to understand QM in a company, we need to see it as part of a complex context and realize that people have had their unique journeys in the landscape of changes.

This research was generously financed by SKF AB and Fagersta Stainless AB in their support of the Division of Quality Sciences at Chalmers University of Technology. We appreciate the support of Associate Professor Sverker Alänge and Professor Bo Bergman at the Division of Quality Sciences. We would also like to thank all the persons at FSAB who so generously shared their thoughts with us over the years and in interviews. We also want to give our special appreciation to Lars Nilsson, the current quality manager at FSAB, who took his spare time to investigate our writings in their final stage. Finally, we would like to thank FSAB's former president Åke Kronberg, who supported and showed his great interest in our work along the way, and Jan Peters, the new president, who kindly let us continue our investigations after we had left FSAB.

Introduction

Fagersta Stainless AB (FSAB) is a company with a high quality image and is one of the major producers of stainless wire rod and wire in the world. The FSAB operations go back several hundred years and production of stainless steel started in 1921. However, the company was constituted in 1984 as a final step in the restructuring of Fagersta AB, formerly one of the major steel companies in Sweden. The company manufactures wire and provides technical support for spring, welding, cold heading, and high temperature applications; and they have core knowledge in metallurgy, rolling and drawing technology. In summary, the stainless steel products from FSAB can be found in applications in all kind of industries – e.g. chemical, construction, automotive, aerospace, and health care.

During the period 1984 - 2000, Solly was the quality and development manager and Book worked at FSAB, as a project manager and change leader, for three years, between 1997 and 2000. Due to the substantial access to data and preunderstanding of the development at FSAB, we decided, together with the third president of FSAB and Associate Professor Alänge from Chalmers University of Technology, to investigate the development of QM at FSAB. The formal decision was taken at the end of 1998, but an informal decision was taken that Book would gather data as he entered the company in 1997. Alänge had also gathered data since he met the top management of FSAB in 1994.

We started to investigate the data from FSAB after we had both left FSAB because of a staff reduction in 2000, when a fourth president entered the company. The fourth president supported our retrospective collection of data through interviews, but he redirected the quality management focus at FSAB, in a financially problematic situation.

The fourth president of FSAB, since its formation in 1984, introduced himself in the December 1999 edition of the company magazine; at the end the introduction, he stated: ”As you will understand, it is too early for me to give any kind of programme declaration, so I ask to return to this matter on a later occasion. What can already be established is that the financial situation is very problematic and that it will take improvements in a majority of areas to reach an acceptable level of profitability. I know that it has been a very tough year for you with the investments, computer system change, organizational changes, and staff reductions, so I hereby wish to thank all of you for your contribution this year, and also wish you a Merry Christmas and a Happy New Year”.

The change of president was the start of still another phase in the evolution of quality management (QM) at FSAB. It was also the continuation of a QM evolution that took

place within a context of restructuring, replacement of presidents, major projects and influences external to FSAB.

This paper describes the evolution of quality management from 1984 until the first part of the coming phase of QM in 2000, initiated after the change of president in 1999. The company had approximately 350 employees in 2000 as the exploration was finalized, adjacent to the final phase of a total quality management (TQM) venture. In FSAB, as in many other organizations, several QM initiatives were conducted over the years to make the company more efficient and effective and to comply with demands and anticipated requirements. As these initiatives, and their origins, are viewed in relation to each other and over time, a complex pattern evolves. A set of initiatives, more or less co-ordinated, and founded on a variety of ideas and agendas, were either part of the QM progress or contextualized it.

Purpose of the paper

The purpose of the paper is to describe the evolution of QM at FSAB between 1984 and 2000 in order to gain a longitudinal view of the development and the context of interrelated changes.

We concentrate on the managerial initiatives and their character over the years, viewed from the perspective of prior and parallel development. The case exemplifies a complex mix of initiatives and changes that took place in the context of business cycles, restructuring, parallel internal change projects, and replacements of presidents.

Structure of the paper

We have delimited the description and chosen a certain main “thread” in the QM development. Around this thread we give information that points at the contextualizing environment and changes. The delimitations are described after the methodology. Then, after an historical overview, various stages in the QM development are described; sometimes these stages overlap with regard to time, but the description basically follows a timeline. The paper ends with a brief concluding and summarizing remark in section 0.

A selection of data from the annual reports between 1984 and 2003 is given in Appendix 1. This appendix gives for example an overview of the financial data, data on the number of employees and wage costs.

Research Methods

Two factors can be seen as decisive in our study of FSAB: firstly, our preunderstanding of FSAB and of the QM development in this company and, secondly, our access to data. Gaining access to data and developing a preunderstanding of what is studied and the environment of the study are described by Gummesson (1991) as the two most central challenges in research. Gummesson (1991) identifies three different roles – the researcher role, the consultant role, and the role of employee – as being beneficial in terms of gaining access to a company and their employees – together, we cover all these roles.

We were directly involved in the development of QM at FSAB. Barry Solly was involved in the operations between 1974 and 2000, holding various roles in product and process development at Fagersta AB, and he was the manager of quality and development at FSAB from its formation in 1984 until 2000. Stefan Book worked at FSAB from 1997 until 2000 as a project manager in the development of a QM system satisfying the requirements of QS-9000 in the spring of 1999, and as a facilitator of QM development until the summer of 2000.

A third person, Sverker Alänge from Chalmers University of Technology, was involved in the work and our study of QM at FSAB. Alänge coordinated the TQM training that the top management group attended in 1994, and later had the role of consultant and TQM advisor between 1995 and 1999. Alänge is called the researcher in the report as he was involved in research on TQM as he met the top managers at FSAB.

The data collection was initially conducted through an action research approach mainly focusing on participative observations during the period from 1994 to 2000. This action research was abandoned in a financially problematic situation for FSAB and as a consequence of the change of president. The new president supported, however, our collection of complementary data from interviews. Our collection of data and the continued work was not related to the further development of FSAB; it was done independently, and without further attempts to influence the evolution. Instead, we focused on understanding the flux of events between the formation of FSAB in 1984 and the situation in 2000. We complemented the data gathered from the period 1994 to 2000, with 23 interviews and document analysis.

In March 2001, six months after Book and one year after Solly had left the company, we conducted 21 interviews at FSAB; twenty of the respondents were FSAB employees and one was the president of a firm supplying FSAB with maintenance service (ABB Teknikservice). Book then interviewed the former president, who had held the post between 1992 and 1999, during a day of reflection in the spring of 2001. Finally, we

inteviewed a management consultant who had facilitated the staff and leadership programmes at FSAB.

In summary, 23 interviews were conducted. We interviewed persons who in total could represent all the areas of the company, and who could give complementary perspectives on the work. Some of the interviewees were assessed to give double perspectives, e.g. the staff and union perspectives were represented by staff who were also union officials. In summary, the 23 persons gave seven perspectives, and seven of the persons gave two perspectives each:

1. Presidential perspective (the 2 latest presidents)
2. Top managerial perspective (5 persons, all members of the top management group prior to the new president's arrival in December 1999)
3. Middle manager perspective (7 persons, middle managers representing all areas of the operations)
4. Staff perspective (8 persons representing different areas)
5. Union perspective (5 persons representing different unions and, in the case of the metalworkers' union, two time periods as well)
6. Supplier perspective (1 person, the president of ABBTS, the supplier of maintenance services working in close co-operation with FSAB)
7. Consultancy perspective (2 persons, the researcher and another consultant involved in the staff and leadership development programme)

The conduct and context of the interviews

We considered it to be extremely relevant not to excessively control the interviews since we were afraid that our earlier roles as leaders would lead to the activation of old habits. To prepare for the interviews we developed a series of questions, but we decided to regard these as preparatory and did not bring an interview guide or questionnaire into the interview situations. Instead we focused on the dynamics of the situation and the interviewee's "story". All the interviewees were informed in advance, but they did not know our intentions; we wanted to give them this information face to face.

We discussed which roles we would have during the interviews – Book carried out the interview, whilst Solly complemented and occasionally clarified matters. There were two

reasons for this. Firstly, Book did not have the same symbolism in the hierarchy due to his previous rank in the company. Secondly, Book had often had the role of stimulating an open and honest dialogue in various situations. Solly himself does not, in fact, give an impression of being normative or dictatorial, but rather gives a more humble impression.

On arrival at FSAB, we were shown to a conference room in which we had often attended meetings on various topics. This felt to be the wrong place to carry out interviews and we therefore looked for alternatives and found a lumber room used for storing all kinds of unused office materials, chairs and tables. We cleared a small space in the mess, which felt very relaxed. In fact, one of the interviewees even commented on the relaxed atmosphere in this little space in a context of all kinds of things.

In principle, we conducted two interviews before lunch and two after lunch, with a short break between interviews, when we briefly discussed the material and summarized our impressions. Each interview was initiated in the same manner, by playing it down and explaining why we were carrying out the interview. We used a digital tape recorder, talked a little about the wonders of modern technology and asked if it was acceptable to record. All interviewees accepted, and the recorder seemed to gain no attention from any of us in the interview situation.

The interviewees were all informed at the start of the interview that we wished to obtain their perspective on developments over the period during which they were employed. We also explained that this was not part of FSAB's development work, but rather an attempt to understand the developments we had been a part of. Their frank and unique narratives and views on what had happened during the past years would help us better understand the development in which we had taken part. Since we both left the company in a restructure, this was a way of making the interviewees feel empathy, and really try to contribute by giving their view. We also emphasized that we had already moved on and focused on having a rather neutral and curious attitude towards what had happened.

We clarified for each of the interviewees that the information from the interviews would not be traceable to any single individual. We then asked the interviewee when he started his employment at FSAB, which roles he had had etc. (yes, they were all men, in a male dominated company). In this manner, we wished to enter a "natural" conversation around the development. We wanted the interviewees to open up and have time to "give us" their experiences as truthfully as possible. And, in fact, one of the persons that were interviewed said at the end that: "this was almost like therapy, to have time to really describe … to empty the experiences over the years".

We took notes in a broad and narrow column – the broad, left hand column was devoted to what was said during the interview whilst the narrow, right hand column was used to note our observations and other aspects that did not come directly from the verbal data. The interviews lasted for two to four hours and a large part of the interview dealt with maintaining a natural flow in the conversation and a relaxed dialogue.

By following the interviewee's narrative and posing questions based on it, we gained an extremely rich and personal picture of the development. We initially avoided guiding the interview in the direction of the quality development work, but rather regarded the fact as to whether the interviewee broached this subject naturally, in his narrative, as part of the data. It was striking how many interviews did not touch the subject of quality development in a natural manner. We were finally forced to guide several conversations to this subject. This, in itself, may perhaps be regarded as a symptom of the fact that we succeeded in avoiding excessive bias in the form of the interviewee telling us what he believed to be our objectives regarding our history in the company. It also indicated that many of the interviewees did not naturally and intuitively describe the QM work as they described their view of the development. We found this fascinating, since, in our perspective, much managerial resources had been devoted to TQM during the past years.

At the end of each day, we went through the interviews and summarized our impressions in the form of a document. In this way, we both reached closure for that day and at the same time prepared ourselves for coming interviews even though we were careful to keep to our interview strategy, i.e. to let the interviewee's narrative steer the interview.

Process of describing

The interviews yielded information that complemented other data from the development work at FSAB. We have not transcribed all interviews, only certain parts. Instead, we have, guided by our notes, gone back and listened to the interviews when we have seen a need for more information to supplement other data. Some passages in the report are taken directly from specific interviews – e.g. when the third president of FSAB explains the interaction with the company board, and his thoughts prior to accepting the post at FSAB. Other passages are taken directly from documents. The whole description was reviewed by the present quality manager who has worked at FSAB for over 30 years. In summary, data from three types of sources combined formed this paper, see Table 3. Firstly, various kinds of verbal communication have explicitly or implicitly affected the study. Secondly, we have explored different kinds of FSAB in-house information available in various documents and, finally, various sources of external information were used for specific purposes.

Verbal Communication	FSAB Documents	External Information
Internal FSAB conversations with operators, office staff, middle managers, top managers	Programme Documentation from management and staff training	ISO 9000:2000
FSAB Communication with Customers	Project management Documentation	QS-9000, third edition
Communication with External auditor	Minutes from meetings	Information Concerning the Steel Industry and FSAB
Retrospective interviews, taped in digital format	Internal Company Magazine (Stålringen)	Information Concerning the Local Area of Fagersta
Retrospective Continual Communication with the Q&D Manager, Solly	Information from customers	Researcher's documentation of TQM at FSAB, including distributed internal FSAB documentation
Retrospective Continual Communication with Alänge	Reports from audits	Kinde and Lindström (1999) on the QS-9000 development in Sweden
Retrospective communication with president who left the company in 1999	FSAB contracts	

Table 3 The data sources divided into three types of origins

Hence, we used a number of sources in combination to describe the development. Book and Solly processed the data together until 2003. Book then wrote the case report while processing the data for a year, in recurrent interaction with Solly. Alänge was also engaged in various communications to facilitate the presentation of different parts of the development. Finally, Solly read, assessed and commented as part of a final collaboration and finalizing of the report. Hence, the report is a result of a co-operation where Book managed the process and wrote the case report by continual processing of different data in combination with continual dialogue with Solly; this process was facilitated by reflections together with Alänge, who also contributed his own experiences at FSAB.

Delimitations

The ambition has been to present a realistic longitudinal perspective of QM at FSAB between 1984 and 2000 in relation to other ongoing development work. To achieve this, it was necessary to combine data from a variety of sources and include a flora of issues and activities that, taken together, give a sense of the evolution.

We have chosen not to involve quantitative data in the description, with the exception of some special parts of the development. In doing so, we want to emphasize that our intention has been to gain an overview of the QM development in terms of interrelated activities and circumstances. We focus on the processes of development and not on the results. Thus, we do not emphasize quantitative results that have been gained from the variety of actions. To look for cause and effect relationships, in our view, would be to search for another thread in the development than the one we that we have in focus in our study. The data in Appendix 1 from annual reports is available as context-giving information.

The case report indicates various programmes – e.g. manager and staff training programmes between 1996 and 2000 – that were interrelated with the evolution of QM. We present them in relation to the QM development, but do not go into details. To describe any such developmental initiatives in more detail would require another research approach, searching more specifically for data that taken together could clarify the specific initiative. In our case, we are not looking for specific explanations; we are trying to reveal a longitudinal and broader pattern of development.

Two other parts, described in a similar fashion as in the case of the manager and staff training programmes, are the implementation of Total Productive Maintenance (TPM) in the production units and the development of a new Enterprise Resource Planning system. These are described to show how they contextualized the QM development, but they could be a source of one or several specific reports focusing on their progress. This is actually the case in most of the developmental projects covered in the report. Hence, to fulfil the purpose, we have continuously evaluated how much detail certain descriptions should include. By doing this, we naturally miss some parts of the development.

A possible comparison between different parts of the organization could also have clarified aspects of the QM development. We have not made such a comparison since we do not wish to elaborate on individual differences and matters on a level that could be problematic for various individuals at FSAB. In relating matters to certain departments, we would have implicitly referred to certain individuals. This does not mean that the phenomena are not indicated and treated in the report; they are handled on a company level and in more general terms, which may lead to a less clear report in some aspects. We do not believe that this is a major obstacle in the exploration of the development with regard to the purpose of the study. In some cases, we do go to the individual level, based on a judgement that this information adds a certain value to the report and that it will not be problematic for any specific individual.

The intention in this report is not to show various facets in depth; the depth of this report is on the longitudinal level, and on comprising enough pieces of the puzzle in understanding relevant patterns affecting quality management. The focus is not on understanding every piece of the puzzle, but rather on exposing the complexity of understanding the puzzle and acting on what we understand. We believe that the report could serve as a baseline for dialogues that could go more into depth on each part and on a variety of phenomena.

An FSAB historical overview

The history of the steel industry in Fagersta, where FSAB is located, goes back to the 12th century[2] in the early days of mining. In fact, the company has its roots in the history of the steel industry in Europe, where steel production grew substantially between the 16th and 18th centuries (Hansson, 1996). New innovative steel processing approaches in combination with increased demand led to increased volumes and need for workers. To satisfy these needs, the owners built workmen's dwellings and other buildings, which stimulated the growth of industrial communities. Fagersta was one such community.

Svensson et al. (1996) describes how many people in the vicinity of Fagersta were dependent on the growing industry; farming, forestry, charcoal-burning, saw-milling, grain-milling and transportation occupied a great many people. The growing industry in the Fagersta area went through several ups and downs and changes of ownership over the years; and in 1853 sugar manufacturer Thomas Aspelin bought the Fagersta industry, taking up residence in the Fagersta manor house. At this time three mills, located in three adjacent areas – Semla, Fagersta, and Västanfors – constituted the Fagersta steel industry. Hence, all three operations were included in Aspelin's purchase.

The new owner closed the operations in Semla and Västanfors and concentrated production to Fagersta. Within this concentrated production they began to develop and expand the operations by experimenting and exploring new technology and methodologies. This led to a considerable increase in the company's productivity, and there was a great demand in the steel market. Over the years until the present day, this market went through several ups and downs, and this variation was very problematic for Fagersta Bruks AB and its competitors.

During the 1860s Thomas Aspelin passed on management of the mill to his son, Christian Aspelin, and, in 1873, Fagersta Bruk became a limited-liability company, Fagersta Bruks AB. Eleven years later, carbon steel wire and wire rod were introduced, and, in 1921, stainless steel wire and wire rod were launched. There was a crisis in the steel industry, however, and in 1924 the report from a governmental steel mill investigation proposed a merger of a number of minor mills in order to gain more efficient operations. Three years later, the operations in Fagersta and three other operations - Klosterverken, Horndal, and Långshyttan – were merged to form the 'Fagersta Group' under the label of Fagersta Bruks AB. In 1937, two other operations, the Forsbacka Mill and the Österby Mill, were

[2] The date of the breakthrough of blast furnaces has been widely discussed, but the standpoint today is that the first furnaces of this type can be traced to Norberg in Bergslagen, some time between 1130 and 1225 (Hansson 1996, p160). Fagersta is located in the same area as Norberg.

incorporated in Fagersta Bruks AB; and the operations were rationalized and modernized between 1937 and 1945 (Lundberg & Uhrbom, 1979).

During and after the Second World War, the export of steel increased, and, between 1945 and 1955, heavy investments in the 'Future Programme', an expansion plan for the operations, led to the construction of four new plants – one melting shop (no. 1), one tube mill, one rod mill and one hot strip mill. The operations were developed continuously, and within 'Steel Plan 69' – a new, focused development of the operations – a new specialty steel melting shop (no. 2) and a new rock drill factory were built. Fagersta Bruks AB invested heavily in the development of the operations, but there was increased competition from 'steel giants' in Japan and Western Europe, leading to overproduction. Combined with a downturn in the economy, the increasing overproduction led to a crisis at the beginning of the 1970s. The (in Sweden) well-known Professor and consultant Ulf af Trolle was commissioned to help the company out of its crisis.

Fagersta AB, as the company had been re-named at the beginning of the 1970s, was restructured into four specialized and highly competitive companies, Seco Tools AB, Kloster Speedsteel AB, Secoroc AB and Fagersta AB, the latter producing both carbon and stainless steel products. Fagersta Stainless AB (FSAB) was constituted in 1984 as a last step in the restructuring; melting shop no. 2 was closed down and FSAB successively became a company specialized in stainless steel wire rod and wire and founded on what was left of Fagersta AB. The company came to be jointly owned (50/50) by Avesta AB and Sandvik Steel AB, who were also suppliers of billets used for rod production in Fagersta.

The FSAB Quality System Development in Context

With the historical overview in mind, this section begins the description of FSAB's QM development. It gives an overview of the process leading to an ISO 9002 certificate in 1992. It also gives an overview of the "Future Project" (not to be confused with the Future Programme between 1945 and 1955), which started in 1990 at the initiative of the second president of the company. This initiative was put into action separately from the quality system development, and it ended in what can be seen as an anticlimax governed by external factors. The section ends with a brief comment on the certification process in 1992 after the "Future Project" had ended. The section gives the background to the more intensive QM development that took place during the second half of the 1990s.

Emerging quality system requirements

From the beginning of the steel industry development until the beginning of the 1970s, the QM[3] aimed at developing products, controlling production processes and developing new and more efficient production methods. The QM activities were an integral part of other work and no one had the specific role of focusing on the QM progress. During the 1970s, Fagersta AB started receiving more formal and systematic requirements from the British aerospace industry. Fagersta AB was forced to "prove" its capability as a supplier via documented quality assurance procedures and measures. The UK Civil Aviation Authority (CAA) had designed a set of standardized requirements. The emphasis of the CAA requirements was on quality assurance of products, and Fagersta AB received its approval certificate from the UK Civil Aviation Authority in the middle of the 1970s. This can be seen as the start of the coming decades' increase in formal demands on the quality system of the company.

QM at FSAB was destined to change gradually even though, at that time, the QM activities were mainly of a quality assurance nature, focusing on product quality; it was not until later that a broader development evolved through various initiatives and forces. Globally, several different quality assurance requirements flourished in the materials field. These requirements did not directly influence FSAB at this time; they influenced those companies who, for instance, directly supplied the automotive, nuclear, aerospace and offshore industries. FSAB supplied wire rod and wire, which was further processed

[3] At this time, QM was not a natural concept in the terminology, but more a defensive approach directed towards quality assurance. In this report, we still use QM as a concept, but the meaning shifts over the years; in ISO 9000:2000 a QM system was defined as "a management system to direct and control an organization with regard to quality". A management system is defined here as a "a set of interrelated or interacting elements to establish policy and objectives and to achieve those objectives"; and quality is defined as "the degree to which a set of inherent distinguishing features fulfils needs or expectations that are stated, generally applied or obligatory".

by suppliers to these industries, but was not affected explicitly. With the exception of the CAA, the QM system requirements in these industries did not reach FSAB.

The requirements of the CAA initiated a development towards more systematic audits of the product quality; activities to maintain quality certificates successively became more recurrent in the operations. It was the responsibility of the Development Manager to ensure that the requirements were fulfilled and that quality certificates were maintained. In order to succeed in this mission it was imperative to cooperate with other units operated by the mother companies. When FSAB was formed in 1984, the company had limited resources for developing new products, but it had inherited a very good reputation on the market from Fagersta AB; and the same operations and services continued to produce high quality products.

The FSAB operations still needed further restructuring and rationalization in order to be competitive; this was also anticipated by many employees, who at this time were accustomed to the many cutbacks. In fact, several employees were afraid that operations would subsequently be relocated from Fagersta. However, investments in the rod mill infused some hope; and, while there was great skepticism and mistrust among the employees, the new investments indicated that production in the rod mill would continue.

After the restructuring, internal product development was much more limited, leading to a discussion in the top management on the adequacy of having a department with the title of Development Department. The discussions led to a formation of a quality and development (Q&D) department, which was responsible for developing products and quality management; it was the same role as before, but under a different name. The role of this department was to gradually change, however, the starting point being ISO 9000 drafts that came to FSAB in 1985.

Successively, the number of customers asking questions about ISO 9000 increased; in conjunction with this the Q&D department put more emphasis on setting up a QM system that fulfilled these requirements. The practical ISO 9000 work did not start at this point, but there were numerous discussions on the matter, and the president formally supported the intentions. However, he left the company in 1986 before the Q&D department initiated most of the ISO 9000 related work.

The ISO 9002 Progress at FSAB

A new president (the second president of FSAB) arrived at the company in 1986; he also encouraged QM system development, but his attention was primarily directed toward the core production. At the same time a more finalized working draft of ISO 9002 was

published in 1986. The Q&D manager perceived the draft as a support of his intentions to put resources into creating a QM system that could stimulate more systematic work. The view of operative personnel and many managers, however, was that the QM work, in practice, was directed more toward documenting operations than improving them. Only a few persons, mainly from the Q&D department, were engaged in the work directed toward ISO 9002. Creating the QM system was not a priority task on most of the employees' agendas, or in the mindsets of the employees, and the work tended to be rather fragmented.

There was still, in 1987, uncertainty concerning the future of FSAB. An investment plan termed Rod Mill 90 was drawn up and presented to the board. It aimed at improving three aspects of FSAB's rod operation, each by a factor of three, in three stages. This was important both for production departments and for gaining a brighter view of the future of the operations. In chronological order, the first stage was to be a tripling of the finishing speed from approximately 20 m/s to about 60 m/s with unchanged coil weight. The second stage was to be a tripling of the coil weight from approximately 330 kg to about 1000 kg, a trend in demand which was expected to appear on the stainless market as it had previously on the carbon steel rod market. Both of these development projects were realized by 1990. The third stage, a tripling of the maximum rod size from the Fagersta mill from about 13 mm to about 35 mm, was examined closely, but was not realized.

At this time, in 1987, the first finalized version of ISO 9002 arrived. After some discussions of the implications for FSAB, still slow in progress, the development of the QM system became more intensive in 1988. Customer requirements were much more evident at this time. Most quality assurance efforts were subordinated, however, to the many ongoing structural changes and the technical development. Moreover, guidance in the work was limited to third party audits from Lloyds and brief training of the staff responsible at the Q&D department in the meaning and requirements of the ISO 9000 standard. Successively, the Q&D department became more associated with the development of the QM system.

The Q&D department staff worked out the QM system with some aid from technical experts, process engineers, production managers, supervisors and technical project managers in specific tasks. The contribution of people outside the Q&D department was limited, however. They managed the daily and more observable operations and did not invest substantial time on developing the QM system. The QM work mainly focused on documenting procedures and it was difficult to see any concrete results from the work that truly stimulated a more systematic development of the operations. At the same time,

there was great improvement potential in the operations and this potential was acted on within the ongoing technical projects.

Work on the QM system was an attempt to design a more systematic approach in developing the operations. However, the Q&D manager sensed that the QM system did not permeate or affect the operations as he would have liked. It gave a basic structure, and, at this time, the ISO 9002 requirements did not emphasize developmental matters but were directed more towards rather defensive assurance work. The ISO 9002 system of requirements thus facilitated a more structured approach in assuring the quality of the operations, but it was difficult to effectively facilitate systematic improvement of the operations.

Nonetheless, external pressure to work on the routines was evident. Different industries had their own specific requirements, and many customers had their own specific routines, formats and technical nomenclature, which could be rather confusing. The sales department met an increase in quality assurance questions on the market, and, in order to answer all these questions, the Q&D department was more involved in formal dialogues that concerned various quality aspects. The QM system development continued, but the recurrent technical development and reorganization of operations consistently received the major part of the managers' attention. The commitment to developing a well functioning QM system was further reduced in 1989 by the closure of the hot strip mill. This was the last major restructuring movement towards a company specialized in rod and wire products. In conjunction with this restructuring, the Q&D Department continued its work towards fulfilling the ISO 9002 requirements.

The Future Project

After the closure of the hot strip mill, the top management reduced its focus on technological development. It was time for an initiative that engaged personnel in further development. The president, supported by an outside consultant, started a major project – the "Future Project" – in May 1990. All the managers, foremen, salesmen and trade union representatives were involved in discussions and reflections on a number of aspects such as company values, the mission statement, and the importance of satisfied customers and profitability.

All employees were to develop awareness of four fundamental principles: basic values, long-term direction, goal and mission statement. The aim of the Future Project was to successively increase awareness among all employees of these concepts and their implications for individuals and their work groups, and then to identify a number of prioritized development projects within the different units. The explicit objective was to

achieve a number of qualitative goals in December, 1990, which were basically deployment of the four fundamental principles.

A project management team, a development group (the Project Management Team plus four union officials) and project groups were defined. The project was divided into three phases: the first phase was to prepare all the managers for the development of the company involving all employees in the second phase; the second phase was to involve all the employees in gaining awareness of the four fundamental principles and how their work could be developed in accordance with these principles; finally, in the third phase, each unit in the organization was to identify, prioritize and propose projects to be evaluated by the Development Group. Selected projects would then be labeled "Future Projects", and these were to be implemented in order to develop the operations.

Three manager workshops were planned in the first phase. Preparatory assignments were handed out prior to each workshop. Eight managers work groups were defined with mini-groups that were to act in specific tasks. These managers' work groups were converted during the first phase into what was called Development Groups. The first, second and third workshops had agendas as shown in Table 4. The preparations for the managers' workshops contained reading, processing a number of questions in work groups and presenting a report.

Agenda for the first workshop	
1. Common introduction and information to all participants	60 min
2. Common exposition of the preparatory assignments and presentation of one group work	30 min
3. Group work in the work groups	60 min
4. Reports from work groups, discussion and design of action plan	75 min
5. Summary and conclusions	15 min
Agenda for second and third workshops	
1. Common introduction and information about ongoing project work	45 min
2. Reports from the work between the workshops concerning the preparatory assignments	30 min
3. Common exposition of the preparatory assignments and presentation of one group work	15 min
4. Group work in the work groups	60 min
5. Reports from group work, discussion and design of action plan	75 min
6. Summary and conclusions	15 min

Table 4 Agendas from the description in documentation aimed to be a guide for the future project

The experience from this approach was that it was effective, giving results of high quality, and it was decided that it would be used throughout the work; it was also perceived to be a good way of diffusing information, exchanging information and avoiding misunderstandings. There was a desire to incorporate this approach as an integrated way of working at FSAB.

During the workshops, the four fundamental principles were elaborated (as described above: basic values, long-term direction, goal and mission statement). A number of fundamental values and a leadership philosophy were developed and decided in consensus; a long-term direction and a goal was decided upon, and a Mission Statement was developed for each of the two business areas (two divisions were formed, based on these business areas).

While the content and work process attracted the Q&D manager, the Q&D department was still struggling with the development of the QM system; the activities within this work were not coordinated with the future project, and FSAB gained no synergies between the two development projects. One was viewed as the Q&D department's responsibility, and the other was a prioritized company development project managed by the president.

In August of 1990, the president presented a summary of the first managers' workshop, which stated that an important goal in the project was to develop a new approach to work that would involve all employees. He further described how the project had been presented to Fagersta Stainless' Board of Directors, which strongly supported both the content and direction of the project. It was an intensive and focused analytical work with the president's full commitment. No practical implications could yet be seen, however.

In another message in September, after a second workshop, the president declared that the work should now be focused on creating the right conditions for mill supervisors and department heads. He stated that it was of the highest priority to examine limits of authority and responsibility in a systematic way. It was also important that the targets and action plans for the areas of responsibility of supervisors and department heads were realistic and based on actual circumstances; therefore, mill supervisors were to take part in the budget preparation work as far as possible.

Only two months later, however, at the beginning of a major recession, a 40 percent staff reduction was announced as a result of directions from the board of directors; the result, in 1990, was a loss of 90 million SEK. The reduction included the virtual removal of the supervisor category and cutbacks in office staff; it was traumatic for both the members of

the organization and the local community and again the trust and confidence in both the management and the owners were affected negatively.

The president initiated the staff reduction, and the removal of the supervisor category led to dramatic changes in the responsibilities of both operators and middle managers. Initially, the operators, without their foremen, were rather lost as tasks and responsibilities changed. The managers' workloads increased and piles of unmanaged work grew; only essential tasks were carried out. The crisis was deep, and approximately a year of "incubation" passed before the managers started to reorganize and work on the piles of work put on hold. People were aware of the crisis that the company was going through, and they were well aware of the fact that no extra resources were available. This forced new ways of conducting work with the available resources.

The ISO 9002 certification

The Q&D manager was convinced that the emerging QM system would not suffice and, in 1991, searched for inspiration at a course: "Making Total Quality Happen", held by a consultancy firm in the U.K. In practice, however, the Q&D department was close to gaining an ISO 9002 certificate of approval. The Q&D manager concentrated the resources on finalizing the QM system and consolidating the function of the internal audit system. FSAB received the certificate of approval in February 1992; a basic quality assurance system comprising the whole business operation had been developed. It was, however, a system built on considerable documentation, and only a few employees had been truly involved in its development.

Top management TQM preparation

The final stage of the ISO 9002 certification took place at a time of financial and management change. This section starts with an overview of these changes, setting the scene for the description of the top management TQM training, the start of a journey that lasted the rest of the decade. The section concludes with a description of the top management planning for TQM at FSAB.

New president and financial growth on the way towards TQM preparation

In parallel with the final work of the ISO 9000 project, the Board of Directors looked for a new president. In September 1991, a candidate who would become the new president of FSAB was contacted. This candidate had previously been involved in a number of change processes, mainly in the engineering industry, where he led restructuring in problematic companies from a financial perspective.

Several of the new candidate's prior assignments had led to rationalization of operations and to reductions of the number of employees, and he did not want an assignment of that kind again. He thus studied the substance in the company thoroughly. He had the financial data from the latest Board meeting in September 1991 and tried to figure out the substance of the company to see if there was something to build upon. The result for 1991 was 63 million SEK, and a volume of 32 000 tons was produced at this time.

He was well aware of the fact that there might be hidden agendas that he did not know about, but he believed that he could be part of a positive first phase if he accepted the assignment. He did not speculate very much on these agendas and decided to accept the proposed assignment. In February 1992, FSAB had a new president, assigned the task of completing the rationalization measures initiated by the former president and of turning the company around from a heavy negative result to acceptable profitability.

When the president had been almost a year at FSAB, the financial figures for 1992 showed a negative result of -60 million SEK; the Board had anticipated a crisis, so this result was actually better than anticipated. There were also signs of a recovering market. At the same time the employees, well aware of the crisis, anticipated rationalization measures that facilitated measures to increase the effectiveness. If the increase on the market had been anticipated, however, rationalization measures would probably meet greater resistance in the operations. There was now a 'forced' increase in productivity, caused by the increase in the market, internal technical development over the years, and staff reduction.

As the market changed and there was an upturn in the economy, a positive development began. The president anticipated a 0 result for 1993, but the developments yielded a result of +65 million SEK. Thus, for the first time in several years, a positive development could be seen. Most of the structural changes needed had been realized, and a ten-year process of technical development had prepared FSAB. Add to this the fact that, in 1993, FSAB received an award from a major customer, Bekaert, as the best supplier of stainless steel wire rod in the world. This was published in steel magazines and in other communications in order to promote the company.

In this situation the market was growing, FSAB had a very good reputation and the operations were prepared for larger volumes and higher demands. Furthermore, many of the tasks previously performed by foremen successively became the responsibility of either operators or managers. Many other tasks were abandoned, and the employees started to question why certain things were done and whether they could be done in a different way. The piles of work that had not been handled during the crisis diminished successively, and, at the same time, a basic new work structure was developed through the ISO 9002 development.

Even though the situation was rather positive, the president believed that other kinds of measures were needed to reach the potential of the business; another level of motivation among the employees and a new way of thinking and working were required; but he did not have any clear idea of how this could be done. He knew that there were several methodologies and tools on the market, but he did not know very much about any of these tools. Furthermore, he felt that FSAB had some kind of burden from its history and he had some doubts as to the composition of the top management group.

The president, the Q&D manager and the manager of administration discussed how a new way of working could be developed. In one of the conversations, the Q&D manager presented some ideas, inspired by visits to Japan and a course he had attended in 1991, and in May 1993 the top management group, consisting of the president, the Q&D manager, the manager of administration, and the wire division head[4] attended a one-day introduction to a TQM concept. An experienced consultant from the UK held the introduction. The members of the top management group were inspired by the ideas, but the president wanted more information. He knew that a cultural change was needed in the company, but he was still unsure of what was needed to facilitate such a change.

[4] At the beginning of the 1990s the company was divided into the Wire and Wire Rod Divisions respectively, and the president was at the time also head of the Wire Rod Division.

The idea was to find a development approach that would facilitate the work to reach a 10 percent market share of the total consumption of wire, which had grown from 900,000 tonnes/year in 1991 to 1,100,000 tons in 1994; during the same period, FSAB's volume had increased from 32,000 tonnes annually to 60,000 tonnes. The organization was continually adapted to the new and more efficient technology and to market needs. Nevertheless, the president felt that fundamental changes in working methods and behaviour were necessary if competitiveness was to be maintained or improved. He was inspired by the manufacturing industry, where he had worked earlier in his career, and believed that there was incredible potential.

During this time period there was also outside pressure on companies to develop the QM via some kind of TQM model described by other organizations, in the literature or in quality awards such as the Swedish, European or Malcolm Baldrige National Quality Awards. The message was that you had better start working on these issues immediately or be left behind. One example that reached FSAB was the message from Zytec Corporation; when they won the Malcolm Baldrige National Quality Award in 1991, they stated that "If you're not on the quality journey now, you better get on it. Only those companies that are on this journey will be around in the future". This type of message, from customers, from consultants and from colleagues further enhanced the pressure and trust in TQM as the right way to develop the company.

FSAB top management TQM training

In 1994, the same top management group attended a more comprehensive TQM training programme with participants from various Swedish companies. The programme was run by Chalmers Advanced Management Program (CHAMPS) and coordinated by a researcher from Chalmers University of Technology. The researcher had recently finished a study of the literature, quality awards[5] and experiences from front line companies using their own TQM approach. He examined these different sources to gain a broader and realistic view on the core elements of TQM at this time.

During the researcher's examination of what was written as compared to his interviewees' descriptions he perceived a discrepancy, a discrepancy that was also confirmed by what he saw at the companies he visited. The books and articles he read gave certain perspectives and explanations contributing to the perception. In the interviews and visits he gained other perspectives, however, contributing to his view of TQM in practice, and the focus was directed more towards understanding TQM in

[5] The Deming Prize, The Malcolm Baldrige National Quality Award, The European Quality Award, and The Swedish National Quality Award.

practice than examining what was written in various books and articles. The data and theories were used in an Affinity Analysis – a common QM tool used to sort and analyze qualitative data – indicating six common aspects that could be used to describe the essential ideas in TQM; these contained various components that together gave perspective to the meaning of each of the six aspects. These aspects and components were presented as an introduction to the programme, and a summary of his presentation can be seen in Table 5 (Alänge, 1994).

Alänge's Six TQM Aspects	
Customer Focus	The perceived quality is a function of content and the way the product/service is being delivered, and a function of the customer's expectations, which depend on previous experience, quality levels of competition, and the promises made by our company. There are basically three types of requirements: Explicit Demands, which, depending on the level of fulfilment, will yield a more or less satisfied customer; Basic Requirements, which are taken for granted and not mentioned, i.e. implicit, but, if they are not fulfilled, there will be a strong negative reaction; and finally Extras, which delight the customer since they are neither known nor expected.
Leadership	A vision and corporate goals should be developed, communicated and understood throughout the organization; a visible leadership, showing in practice what is important – "walk the talk" – should then, together with recognitions and rewards, support a selected strategy. (This meant that if you wanted to promote teamwork this should also be recognized and rewarded; instead of focusing on individual performance the performance of teams should be rewarded. There had to be consistency in the messages.) A few key goals should be used to drive change throughout the company; these goals should be aggressive with high expectation levels, and communicated/deployed to all levels in the organization; the progress should be measured. There should be continuous communication by all means possible, immediate feedback, recognition, rewards, and development reviews of each employee.
Total Approach	Every employee in every department should participate - "empowerment" – and the supplier and customer relations should be cherished; wide responsibility should be taken for the environment, educational system, etc..
Continuous Learning	Investments should be made in human assets and a culture of continuous learning should be developed. Different learning cycles can be used in developing this learning culture, e.g. PDCA for problem solving, benchmarking, internal and external audits and rewards.
Process Orientation	The "white spaces" on the organizational chart should be managed, looking at the input, activity and output. Process mapping makes the process visible; process owners and cross-functional teams have roles that together facilitate process management. The process owner is charged with responsibility for the efficiency and effectiveness of a cross-functional process.
Standardization for Creativity	Routine activities should be standardized in order to free more time for creative work. Tools like the 7 QC tools, 7 management tools and learning/problem solving cycles like the PDCA are part of this standardization for creativity; other wider concepts like 6 Sigma (Motorola), QIP (Xerox) can also be used; different standardized ways of measuring can be applied; the content and ways to provide training may also be standardized in different manners. There is a potential conflict between standardizing and diffusing the most efficient standard operating procedure, and empowerment, i.e. letting people take charge of their improvement processes and feel ownership.

Table 5 A summary of the descriptions of the six aspects described in Alänge 1994

The six aspects were the basis for recurrent reflections on the TQM programme, which was divided into six blocks, in total 17 days, between February and August, 1994. The programme presented a perspective where QM was a matter of company development, instead of the common, more defensive view in which it is a matter of controlling the quality of products and processes. The top management group was introduced to a variety of principles, approaches and tools. These principles, approaches and tools were presented by consultants from the US, UK and Sweden who had previously used them in various roles within different companies. The consultants had all been involved in internal developmental work in some companies and as consultants at other companies. To complement the industrial emphasis in the training programme, a number of methodology experts and a Professor in psychology were also involved in different sections of the course.

In summary, the combined competence in company development was very comprehensive; it was a mixture of different competences and tools that together covered a wide range of themes. The president reflected, however, on the fact that the experiences presented were mainly from larger companies and questioned whether the approaches were really applicable to a smaller company of FSAB's size. The more he thought about it, the more he felt that the size did not matter. It should be easier, he reflected, to develop a smaller company in line with the ideas presented, since all employees were to be engaged. Somehow, a feeling emerged that he had never seen such an attractive concept. He perceived the programme presented as an approach that addressed the total substance of a company; the principles and tools were perceived as applicable to any situation and issue that could appear, and it was, from his perspective, very well structured.

Top management TQM planning

Although the president and manager of administration were inspired, the Q&D manager was the most convinced member of the top management group; during the development of the QM system he felt that many aspects were missing that can be seen in the TQM concept. The Q&D manager summarized his impressions of TQM. The information in the summary comes from Alänge (1994), describing TQM as "the new paradigm for industrial practices", complemented with some aspects from courses that the Q&D manager had taken prior to the 17-day TQM training.

In his summary, the Q&D manager defined TQM as "a set of systematic management principles that make the best use of all resources; and in order to make the best use of the resources the potentials of all employees should be used to achieve demanding goals, set by a committed top leadership and based on customer requirements". In a previous

course, three ‘voices’ were described – the voices of the customer, process, and employee - which one should always listen to in the development. These voices were presented in a symbol used in the technical development programme – “Trådverk 90” - initiated in 1987. To develop FSAB into a “TQM company”, the Q&D manager summarized six keys to success (see Table 6), by extracting and summarizing information from Alänge (1994) and some other complementary information.

The Q&D Manager's keys to Success	
Customer Focus	To focus on the customers' explicit and implicit requirements, needs and expectations. To understand and focus on the promises and commitments made by the sales personnel and others who are in direct contact with the customer. To understand and focus on customers' previous experiences of the company To understand and focus on the competitors' performance levels
Leadership	To perform conscious leadership where the top leaders develop visions and goals that can serve as guidelines for all the employees. To set and use aggressive goals leading to very high expectation levels. To show in action what is most important in the operations To give feedback on an individual level on work results in terms of quality and usefulness for subsequent steps. To coach and create a good environment and facilitate the development of employees that can contribute to attaining the company's goals. To communicate continuously both vertically and horizontally.
Total Approach	To make TQM the concern and responsibility of everyone in the company To develop close relationships with key customers and suppliers so that everyone understands the requirements and needs To use groups for generating solutions to problems and improvements as a major performance driver To see to it that everyone is involved in continuous improvement of work processes.
Continuous Learning	To see continuous learning as a cultural factor rather than an investment in training To challenge existing ways of thinking To use a systematic approach to problem solving To organize continuous improvement activities To learn from the best in the field To follow up and control the operations and the developmental work
Process Orientation	To regard the work as a large number of steps crossing the organization over functional boundaries. To analyze how work processes are actually carried out in order to obtain an efficient development of the processes To record and change in order to improve all work processes
Standardizing For Creativity	To standardize methods and problem solving techniques – for example the seven Quality Control Tools and seven Management Tools - throughout the company - and make continuous use of them.

Table 6 The Q&D manager's summary of TQM indicating keys to success, based on Alänge (1994)

Hence, the TQM training programme was based on a number of fundamental principles. A few selected tools were practiced during the training and could immediately be applied at home in the daily business. An initial project plan for how to develop FSAB into a

company applying the TQM principles and tools was also formulated; this plan contained seven stages as presented in Table 7 below.

Initial TQM Project Plan
1. Top Team formulates Mission Statement based on the present statement + internal customer principle, service quality, and continuous improvement; and defines an organization optimized for TQM.
2. Middle management + Unions – introductory training in TQM concepts and methods
3. Discussion (Top Team/middle management) of mission statement, organization, quantification of goals (benchmark?) and measures, tool selection
4. Top Team finalizes methods and tools and defines and prioritizes a number of CAT projects.
5. Middle management training in methods - project management, meetings, personal scheduling; and training in customer, process, management, and personnel-oriented tools
6. Information to all employees
7. Implementation

Table 7 The initial plan for preparation and implementation of TQM that was developed during top management training

To involve all personnel at FSAB, the managers decided to adopt a project structure inspired by one of the sessions in the TQM programme. The intention was to involve 100% of the staff in various types of improvement work. Two types of teams were defined by a UK consultant: (1) CAT – Corrective Action Team – was a highly motivated multi-disciplinary team formed by the top management team that addressed a major problem that could be solved in the short term, typically within six months; (2) CIT – Continual Improvement Team – was one of several teams led by a first line manager, addressing continual improvement of a business process. Each team leader was to have the proper training and skills in problem solving and leadership.

The TQM project plan put TQM at the top of the agenda for the company and a rough timeline for the seven-stage plan was defined, see Table 8. The scope of QM at FSAB was now "total approach" covering all areas in the company. This could, of course, have been the case within the ISO 9000 work since there was nothing in the requirements of ISO 9000 that hindered the company from doing so. To see how this could be done was not an easy task since ISO 9000 did not offer the same guidance as the TQM training. The TQM training gave a much richer perspective of how to achieve the objectives.

	1994	1995	1996
1. Mission			
2. Training			
3. Discussion			
4. Finalize tools			
5. Training			
6. Information			
7. Implementation			

Table 8 Timeline for the implementation of TQM

TQM initiation at FSAB

The top management group had gone through 17 days of training in which they had also planned the TQM initiation at FSAB. In their baggage was the history of prior structural changes, the ISO 9000 progress and the Future Project. Further, there had been several years of financial growth and strengthening of operations based on the modernizing of operations during the 1980s. In this section, the TQM initiation is described in terms of the phase between the top management training and the TQM mobilization at FSAB. The layout of the TQM course, preparing 28 persons that would have a central role in the development, is described as is what took place during the period of the course. The section ends with a description of the TQM presentation to all employees on a broader scale.

The first steps towards TQM training at FSAB

The wire division head, who was very action-oriented, immediately used some of the analysis tools learned, both in his management group and with customers. In a workshop with several customers, he used one tool to analyze the customers' most important criteria for evaluating a supplier. The participants from FSAB all believed that price would be the number one criterion, but to their surprise it was only the third. Quality and service that includes delivery precision were more important. All the customers appreciated the workshop and the fact that quality and service had greater priority than price increased the status of quality in the wire division. Furthermore, the exercise exemplified how this kind of tool could be used in practice.

Besides the wire division head's practical work there was not much action in line with the intentions of the top management TQM training. QM was still mainly conducted via internal and external audits. By this time, the staff at FSAB had experiences from audits as recurring events, and as one tool for developing the company. This development only addressed the basic requirements within ISO 9002, and most often different improvement activities were limited to changes in documents or plans. That is, the procedures were modified and actions were taken to conform with requirements and findings during the audits.

After some time of incubation, the president and Q&D manager tried to engage the researcher at Chalmers in the implementation of TQM at FSAB. This was not an easy task. It was very difficult to get hold of him and the president finally asked one of the staff at Chalmers if he had "gone underground". When they finally got hold of him, the researcher had a full agenda. The researcher accepted the assignment to assist FSAB. However, not until the spring of 1995 was there a concrete plan for the continuing

internal work; an internal seven-day training programme was on the agenda for the autumn of 1995.

Seven days of leader training in TQM

A group of 28 persons – later referred to as the 30 group – took part in the Fagersta Stainless Total QM Programme. The group consisted of the top management group, union officials, and participants chosen to cover all vital aspects of FSAB. The top management took part in this programme to express their support and engagement and to transfer the experiences and results from their 17- day programme. The aim of this seven-day training programme as described in the documentation was:

> *"... to provide the participants with visions, concepts, tools, and a frame of reference that enable radical improvement of cost, cycle time, and customer satisfaction. World-class examples of TQM implementation will be presented by persons involved in the change processes. Special attention is placed upon the implementation of TQM, Process Management and Benchmarking in Xerox Corporation."*

The training programme had been tailored to the needs expressed by FSAB in a dialogue with UK, US, and Swedish consultants involved in the 17-day TQM training programme. The programme was again coordinated by the researcher. It was divided into three blocks, where consultants with first hand experience from Xerox, from a number of UK operations and companies, and from ABB took their respective parts. They gave presentations and helped with workshops on a variety of topics.

Block one

A programme overview and introduction to TQM was presented by the researcher and an US consultant in the first block, on August 25-26, 1995. The consultant was a former senior executive, vice president in the Xerox Corporation, and corporate quality officer in the development of Xerox's TQM change programme. The two days within this block were basically directed towards developing understanding and skills in various quality concepts and tools. These were presented in relation to Xerox's conceptualization of and approach to quality management.

The content of the first block was rather extensive and formed a platform for the whole programme; concepts and tools described in the programme are summarized in Table 9. By presenting such an extensive content the participants were to gain an overview and choose tools and issues. After the overview, the selected tools (bold text in Table 9) were practiced in workshops. During these workshops, the participants applied the selected

tools to existing FSAB issues. The whole second day was concentrated on such work, and concluded by the president and researcher by presentation of assignments to be finished before the next block in September.

Summary of the programme folder, Aug 25-26 1995, in the 7-day TQM Training Programme
1. an approach to organizing for quality
2. a 6-step problem solving process seen as a learning cycle
3. an organized quality improvement process
4. a job ticket facilitating the planning and follow-up of various projects with a focus on the receiver of the results as the customer of the project
5. a training sequence for learning problem solving and quality improvement
6. an approach to deployment of things learned, for instance a new tool, and to policy deployment
7. an approach to meetings and evaluation of meetings
8. the 7 management and the 7 "basic quality control tools"
9. an approach, based on a tree diagram, to break down the key areas for 'business success" into goals and key projects
10. an approach to evaluate and develop management behaviour
11. a way of thinking and acting for keeping and developing customer contacts
12. a method for customer surveys
13. an approach to process management and improvement, and an emphasis that "How well your company's key business processes are identified, analyzed, and improved will determine your company's success in the 1990s"
14. a 7-step benchmarking method
15. an approach to change management and continuous improvement, finalized with some conclusions on TQM
16. an approach to analyzing the market and opportunities
17. a methodology taking you from key areas for business success, broken down into success factors and into a strategy, and a method for working on mission and vision alignment.

Table 9 Seventeen defined approaches and methods in the programme folder for the TQM training Aug 25-26, 1995. 4, 8, 9 and 17 were prioritized as selected tools, applied on existing FSAB issues in group work.

Block two

The second block of the training programme took place on September 11-13, 1995. One specific matter in company development was focused upon on each of the three days. The first day concerned the management of change, with special emphasis on the role of leadership in TQM implementation. During the evening, the assignments handed out by the president at the end of the first block, August 26th, were presented and discussed. The

second day focused on quality function deployment and policy deployment as tools for company development. Finally, the third day was dedicated to process orientation and a process-oriented methodology for company development.

A Professor in psychology from the UK, whose main research area was the management of change and implementation of strategy, ran the first day of the course. A number of facets of organizational values and culture were presented in relation to leadership for empowerment and change. These were related to practical examples from various companies. Furthermore, the Professor discussed the managers' role during the transition from current a new behaviour, and a number of phases that a person goes through in the transition. Finally, the participants listened to a presentation of different roles that a person may have in a team, and concluded the session in group work on team behaviour.

The second day was led by a senior consultant from the UK who gave a perspective on knowledge in quality function deployment (QFD) and policy deployment in relation to TQM. By using QFD, the consultant presented a comprehensive methodology for translating customer requirements into appropriate company requirements; using the methodology this was successively worked on by different functions in the company. The methodology was then complemented by presenting an approach to policy deployment and its relation to TQM. The whole day was basically focused on how to transform different needs and requirements into efficient and effective, customer-focused company development.

Finally, the third day of the second block was led by a Swedish consultant, focusing on process improvement and management. The consultant was the head of a Swedish subsidiary of the US consultancy firm developing the process mapping methodology. Before taking on the role as consultant, he was involved in process improvement and management within the ABB group. A methodology for process improvement and management was presented and practiced, where process mapping was one part. The programme for the day was divided into seven sections, see Table 10.

Introduction to Process Improvement and Management
1. Overview of the fundamental ideas behind the methodology
2. How to plan for a process improvement project
3. How to use a Relationship Scheme, an important tool for finding control of the project
4. How to use a Process Scheme, an important tool in the analysis and design of a process
5. An overview of the activities that comprise the implementation of a "should be" process
6. An overview of the term process management
7. Developing an action plan for the forthcoming improvement work

Table 10 The contents of the introduction of process improvement and management

The contents of these seven sections were applied in the further development at FSAB. A process improvement project would be part of a strategic plan for development. This plan was designed from a framework of prioritized areas that were connected to FSAB's mission and vision. A number of success factors were identified as central in the development of each key area, and a number of projects – e.g. the process improvement project – were identified to drive the development.

The FSAB success tree

As the final days of the seven-day TQM training programme came closer, there was still confusion among several participants about how to proceed in practice. For this reason, before the third and final block, the researcher facilitated a two-day workshop with the 30 group. On October 17-18, 1995, a set of guiding principles and statements previously developed were processed in group work. Prior to the workshop, the researcher examined preliminary versions of a company mission statement, and a set of policies for each of the four key areas so far defined for success. He also examined ideas on the long-term direction and vision, and how people at FSAB could measure progress in key areas. He discussed his view with top managers and all participants then received copies of the researcher's comments.

The participants were divided into working groups and the principles and tools learned during prior training were applied during this workshop. The assignment was to adapt and define the FSAB mission and vision, policies, and key areas for success. It was clear that the president viewed this work as absolutely essential in the development of the company. In fact, as one of the managers asked how much time was available for a certain task, the president responded by stating: "this is so important that you should take all the time that's needed". The message was that the result of the work was not to be a consequence of compromise due to lack of time.

Everyone in the training programme was involved in the development of a Success Tree (see Figure 2), inspired by the US consultant involved in the first block of the FSAB TQM training; the goal was set that FSAB would succeed in developing well-functioning work in accordance with TQM over the period 1996 – 2000. It was heavily influenced by key areas for success identified by Xerox and their way of presenting these. However, the president of FSAB added one key area, inspired by a very successful competitor to FSAB, which already had a company development approach based on TQM. He insisted on having environment as a key area. It was agreed upon, and the total outcome was a new set of guiding statements, a new mission statement, a vision, and a set of policies underlying each of five key areas for success.

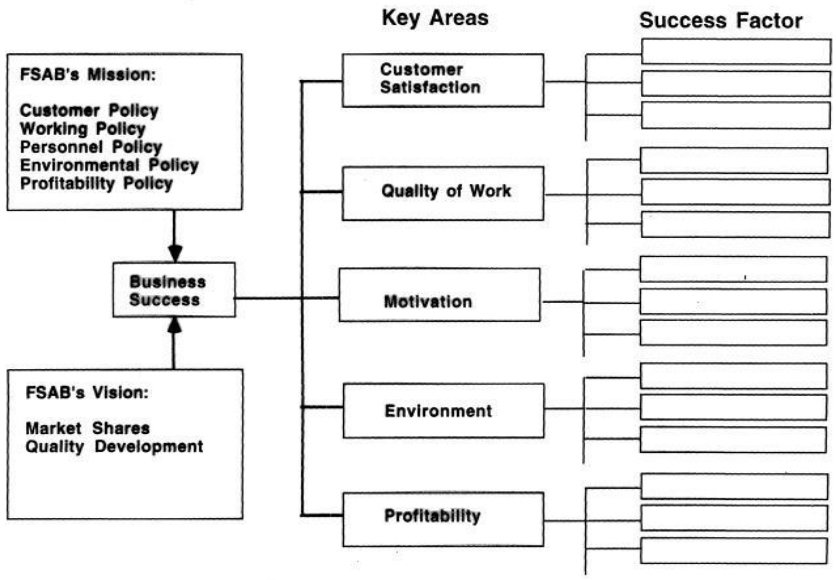

Figure 2 The FSAB Success Tree

A number of success factors for each key area were also defined and prioritized, and assignments were subsequently handed out to various project groups. A number of improvement projects were initiated and planned during the TQM training. Some were identified in an inventory of ongoing developmental work already planned; others were results of the TQM training. The ones that the top managers decided to initiate or to put in a Project Bank were labelled CAT projects, and CIT projects became the name for more local work addressing local, less cross-functional issues. The CIT projects were supposed to emerge in the improvement work driven by various improvement groups to be defined for the whole organization.

Besides the emerging TQM structure, with CAT and CIT projects, there was another type of project. These were initiated by the QM system and they were termed CA Projects, which were corrective action projects leading to actions on problems found during internal or external audits. The internal audits were conducted by FSAB employees, sometimes with the aid of external professionals. These audits were always initiated by FSAB while external audits were conducted by external parties. An external party could be a customer or someone acting on a customer's behalf. It could also be an external independent organization such as Lloyds Register Quality Assurance or Bureau Veritas, providing certification or registration of conformity to ISO 9000 or other requirements. It was the managers' responsibility to ensure that the nonconformity of a requirement was attended to in a CA project, but it was the Q&D manager's responsibility to administrate these projects and coordinate them, as well as coordinating the CAT projects.

Thirteen CAT[6] projects, defined according to the UK consultant's advice, during the top management group's 17-day TQM programme during 1994 constituted some of the projects. All CAT projects had a three-digit ID starting with the number 8, and a label, e.g. CAT804 "New IT system". The number 8 in the ID was a link to an account where all the CAT projects could be traced with regard to costs. The other numbers were part of the serial number. CAT projects became part of the terminology at FSAB, even though most people did not know what the letters CAT stood for. Several persons in the organization found the terminology rather confusing, but a number of persons were defined as being responsible for a CAT project. Each one had an estimated budget and an estimate of when it should be completed.

One of the major CAT projects was to develop a new and modern IT system, which was comprehensive and complex work. A major part of this work was the development and installation of an ERP[7] system, the ERP system project. The consultancy firm offering the ERP system initiated a process analysis conducted from October 1995 until March 1996. Ten persons from FSAB, of whom five had participated in the prior process improvement and management training, were involved. The process analysis was not conducted using the approach learned during the process improvement and management training, however. The analysis was made on an individual basis, and depending on prior knowledge the maps were more or less detailed and effectively structured. The training may have facilitated some persons' mapping, but it was not the type of systematic process analysis practiced during the TQM programme. None of the persons from the consultancy

[6] CAT – Corrective Action Team, and CIT – Continuous Improvement Team; as previously defined.
[7] ERP – Enterprise Resource Planning, basically a broad IT system for managing the company and the operations integrating different information in one system with different modules for different functions such as accounting, logistics and the laboratory.

firm offering the ERP system were involved in this part of the work, and one of the subsequent problems in the project was that the consultants did not understand the FSAB processes.

It was an extensive mapping of processes related to: Sales including quoting, complaints and customer specifications; Planning, including supply of raw material and different planning sub-processes; Inventory management; Quality, including testing, product inspection certificates, handling of nonconforming products and customer specifications; Production of wire and wire rod; Transportation; and, finally, Finance, including accounts payable ledger, sales ledger and calculations. All the files were put in a folder and different routines and important documents were connected to the files.

The process mapping, being part of an actual development project, was not part of the training in TQM. Hence, in this practical situation where the tools could be practiced outside the theme in the focus of the process improvement training, this was not recognized, even though process analysis was one vital tool within FSAB's TQM approach that needed further practice and integration. Instead, the process-oriented work was only conducted during practice explicitly expressed to be such work. This was a general problem in the TQM process - participants were enthusiastic during training and specific sessions, but the tools, principles and approaches were just not applied during the daily work.

Block three and the change management organization

At a meeting, October 19, *1995*, the UK consultant who was to present and facilitate the training during the last block commented on FSAB's work so far; the comments were summarized by the Q&D manager in internal minutes later distributed to the top management group. They concerned how to organize the implementation of TQM, the role of a Top Team – a team of members that together was to lead the TQM implementation – and, finally, aspects of training including facilitation.

A number of issues were discussed and processed during the three days before the third and final block of the seven-day training programme. The third block took place on October 20-21 and focused on TQM implementation, various roles and tools, and the design of FSAB's continued TQM process. Both the UK consultant and researcher facilitated the training. The contents of the block were framed within an approach labelled "Step Change Total Quality"; five assumptions perceived as essential in the implementation of an improvement programme were first presented, see Table 11.

Five Assumptions
1. You should not depend on some "Guru" approach if you want a successful implementation
2. You should tailor the approach to the country and company culture, but use a common approach and model. Use the Step Change approach based on 3, 4 & 5 below
3. You must achieve short-term benefits and early success before implementing across the organization
4. You should base the improvement work on measures
5. Continuous improvement is not enough, start with Step Change

Table 11 Five assumptions guiding the suggested approach to improvement

Going on these five assumptions the UK consultant described a three-step change model based on three elements – Customers, Processes and People – see Figure 3. In step 1, measures are set and an agreed business strategy developed; in step 2, a "customer designed" organization is formed and costs of processes are minimized; then, in step 3, as the Top Team agrees on the measures, work founded on a principle of involving 100% of the staff in reaching the change goals is described as the most important and critical step.

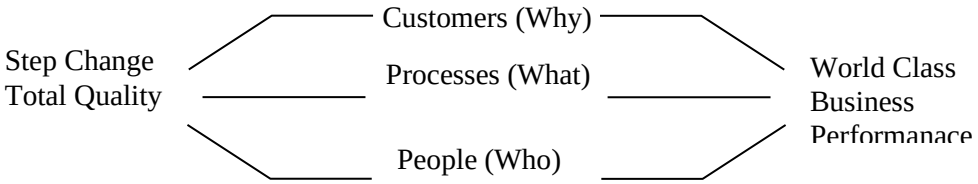

Figure 3 The Step Change Model

In each of these three steps, different tools can be applied: in step 1, a methodology covering the work from defining a mission statement to identifying business drivers and performance measures, the fishbone diagram and benchmarking are examples of tools that can facilitate the understanding of the company's competitive position; in step 2, a business process analysis is suggested to understand the processes, and, after this, process re-engineering is suggested to ensure the most efficient processes in the organization; and in step 3, benchmark measures, a team and problem solving structure and other tools are presented as a means to obtain 100% commitment.

After the presentation of the Step Change Approach and different tools, the participants took part in a group exercise. Five different groups containing all the participants were

assigned the task of brainstorming and presenting answers to three questions: the first question concerned why TQM should be implemented; the second question addressed what benefits FSAB could gain from TQM; and the third question concerned what personal benefits the participants could see. During the group work, the five groups summarized the answers on slides.

In total, the key words in the answers to each of the questions in Table 12, gave a perspective on the groups' perceptions of TQM; all the participants were Swedes, but the answers were written in English so that the UK consultant could be involved during the presentations. This evidently affected any nuances in the answers; nevertheless, the information on the slides indicated some of the participants' perceptions of TQM after the training.

	Why implement TQM?	What benefits for the company?	What personal benefits?
Gr. 1	-systematic improvement method -involves everyone -common goals	-clear goals for all -more efficient -more customer focus	-more participation -job satisfaction -more responsibility -personal development
Gr. 2	-help to achieve company vision	-more engaged personnel -secure future -improve the result -customer in focus -world class performance -all employees working in the same "direction"	-increased satisfaction in daily work -better time sharing -better information/ understanding
Gr. 3	-everybody else…… -continuous improvement -more competitive -structured way of working -customer focus -right the first time	-better profit -satisfied customer -more committed personnel -lower production cost -personnel involvement -market share	-increased competence -increased salary -job security -more interesting job -"keep head on"
Gr. 4	-to do right things right –from the beginning -to organize our job smarter -to get the understanding of other people's job -to involve <u>all</u> people in company -minimize internal problems (delay, quality) -eliminate internal conflicts -to supply the right material at the right time, at a competitive price -stay ahead of competition –have the edge -to gain market shares!	-to gain competitiveness -to achieve goals -to get involvements of people -to improve yields & efficiency -reduce time spent on daily problem solving -reducing cost – higher profits	-stimulating people -involvement -personal career -personal fulfilment -stimulating further education/training -learning other people's job/problem -getting attention -receiving recognition
Gr. 5	-motivation -customer in focus -working method -continuous improvement -team work	-outside the company -inside the company -personal	-competence improvement -motivation -competitive -well organized

Table 12 Results of the first group work at the end of the third and final block of the seven- day TQM training

There was also a second group work task, where the same groups addressed three other questions: the first question concerned what is to be done differently; the second, how each person will work differently; and the third, how each person will make the time. The groups, as in the previous assignment, presented the results of their work with key words on slides (see Table 13).

	What will be done differently?	How will I work differently?	How do I make the time?
Gr. 1	-cross function teams -selecting team members CAT -selecting project (customer in focus) -identifying problems instead of direct solving (technique) -total quality in focus -better acceptance to ideas from others -better use of feed-back	-walk like you talk -use of management tools -measure results -process mapping -increase participation in group work -regular meeting with personnel for CIT -better time holding -encourage people to join group work - improve all type of information - listen to / take consideration to other people	-increase delegation -avoid doing the same mistake again -agenda for the day (self discipline) -cut off the telephone
Gr. 2	-better communication (listen – answer – listen) -to work more: structured, in longer terms, planned -better problem solving: base decisions on facts, meetings more efficient -sensitive analysis	-team work -work more disciplined and smarter -give information more often and earlier -better prepared at meetings -understand whose customer I am, define internal customers -find out how my work will influence my "customers'" result -make clear for my "supplier" what he is expected to deliver -use common sense -use quality tools -reflection, take time off	-better planning -have right priority -work more disciplined -delegate, decision should be taken where the problem is and can be solved -respect meeting times and other people's time table
Gr. 3	-problem solving* -teams -tools -decision making on facts* *follow up, implementation, complete/prevent	-questioning -priority -planning -information	-require patience and respect -delegate -long term work -discipline, complete work -"do as you say"
Gr. 4	-team work everybody's responsibility -create list of ideas -inform about present projects -PC-network -give 100% -inform -work for changing -use what you have learned -take care of everybody's knowledge -break the walls	-sell the TQM idea -be convinced -listen -inform -team work – involve new members -be active	-give TQM high priority -delegate -work in a disciplined way -create resources -changes step by step
Gr. 5	-better group work -broader customer focus -better information on company goals	-prioritize better -encourage team work -encourage training	-the time it takes

Table 13 Results of the second group work task at the end of the seven-day TQM training

The programme ended with a summary by the researcher, going back to different aspects covered during the programme. Further planning and organization of the work were based on the contents of the UK consultant's presentations. In an internal message at the beginning of November to the top management of the company, the organization suggested by the UK consultant was visualized, see Figure 4.

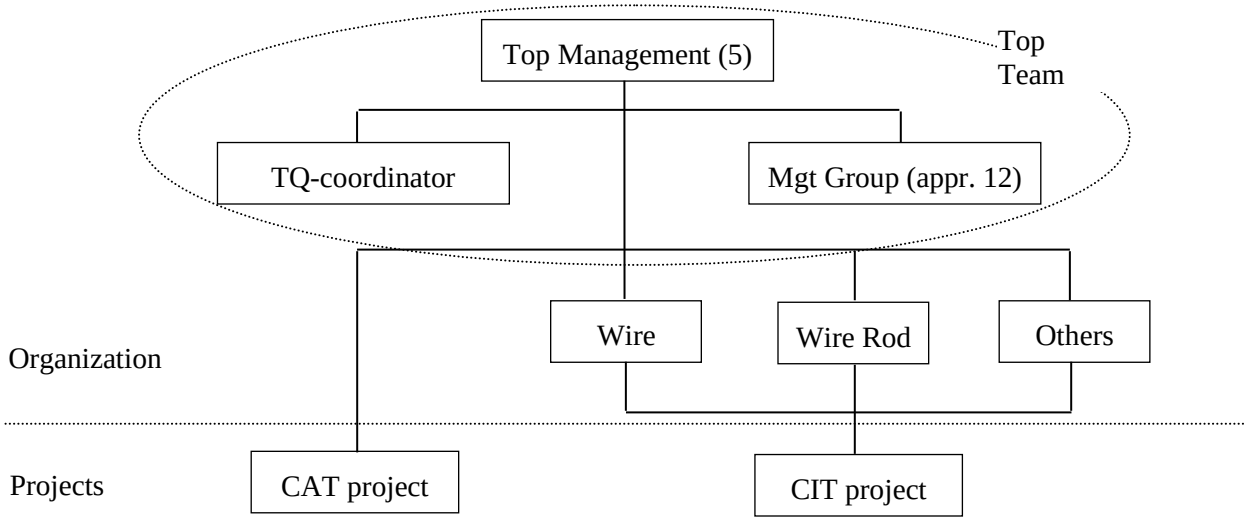

Figure 4 The TQM organization proposed by the UK consultant and adopted by FSAB

Within this structure the tools and principles learned were supposed to be applied in the development of the company. A TQM Steering Committee - the Top Team - involving top and middle management and union representatives: 17 persons in all were to coordinate the progress. The company president chaired the committee, and an agreement was reached with the researcher to act as mentor, and the Q&D manager was appointed to act as TQ coordinator.

The Q&D manager also collected names for an initial implementation group; the TQM Steering Committee and approximately 15 other persons from all areas within the company became initial members of this group. The members were to facilitate the development through their enthusiasm and commitment to TQM. They were supposed to be "eldsjälar" where eldsjäl is a specifically Swedish term for a person who is very committed to something. In practice, however, many of the persons in the implementation

group were selected on political grounds rather than on their level of commitment; only a few members facilitated the TQM process.

Members of the Steering committee successively suggested new members for the implementation group. By May, 1996, it contained 56 persons in all. After this, no further person was added, but some persons left the company; nevertheless, the list was never updated and was a static group on paper. In practice, most participants did not receive any specific practical role in developing the organization.

The CAT CIT and CA projects were described, and improvement groups were components in the organization of TQM; a "Champion", who was part of the Top Management, was appointed for each of the five key areas. These Champions were responsible for developing a way to measure progress. Not until later, however, were these measures developed; and no initial measures were taken that could indicate the current status. Nevertheless, TQM was launched on a broader scale.

TQM presentation to all employees

TQM was launched on a broader scale in two ways: a kick-off with information to all employees and the president, the Q&D manager and the personnel manager each contributed an article to the company magazine. This all took place in December, 1995; thus, almost two years had gone since the top management group participated in the first session of the CHAMPS TQM programme.

TQM kick-off

In a two-hour session, all employees were informed of the plans to develop FSAB into a TQM company. The information and results of previous TQM training programmes and information on the overall situation on the world market was the baseline for the kick-off. First, the president gave information on the overall situation on the market, the fierce competition, and how FSAB could meet this competition; he explained that TQM was judged to be the best option available for the development of FSAB. The Q&D manager then described TQM; the vision, policies, the six keys to success, and an action plan for future work; and the metalworkers' union head described why he supported TQM, and why it was in line with what the unions wanted.

Nevertheless, the intentions were met by enormous skepticism! Several operators subsequently asked the union official why he was involved in this. All those employed during the beginning of the 1990s remembered the last similar "campaign" – The Future Project – which ended in a 40 % staff reduction; and the ones not employed were soon informed. There was major resistance, and most employees had a feeling that this was

some new idea from top management which, over the years, would render no improvement at all. The attitude was that this did not mean anything in practice, and several employees wondered if the managers had nothing better to do.

The top managers were not aware of this reaction among the employees. They only recognized feedback that expressed that it was too much information at one time, but not that the employees were that sceptical.

TQM presentation in the FSAB company magazine

The intentions to develop the company, and how to do it, were also diffused in the December, 1995, edition of the internal company magazine (Stålringen). The cover showed a postcard with the headline – Change for improvement – above a Christmas view of the head office. In three different articles, the president, the Q&D manager, and the personnel manager described their views of how to develop the company, of competence development and of the development of QM. The president wrote an article summarizing the year that had gone:

The Final of the 1995 Test of Strength

"We are at the end of a, from many aspects, very interesting year. The great demand following the upturn in the economy has put FSAB among the three greatest producers of stainless wire rod.

We have had the opportunity to increase our market share during a period when the total volume [on the world market] has increased.

Our product quality is better than ever and we invested 10 new millions in order to ensure the quality level. The technical service has been reinforced and improved.

We have over the last year been criticized by our customers for poor delivery precision. We are in total agreement that we must become much better. We now have the opportunity to improve our delivery service once again. We must plan correctly. In December, a few customers wish to postpone delivery until the following year. The reason is a temporary excessively high inventory level. Not until the second quarter of 1996 can we anticipate a normal inventory level at our customers.

The Wire Division has continued their maintenance work on a broad scale. We can now see an end to this phase and anticipate more investments for increased capacity.

The development of market shares and volume has been satisfactory with high product quality. We have not, however, been able to honour our delivery times to the wire customers.

Fagersta Teknikservice [the wholly owned, outsourced maintenance company] is going from strength to strength with increased external orders, loaded order books, and good profitability. The plan for next year is increased turnover and sustained profitability.

The work to consolidate the Quality Management system, ISO 9002, is progressing in line with our plans.

In this number of Stålringen, there is an introduction ton and suggestion for how we together can cope with the competition and sustain success.

Thank you for a great job well done during the year.

I wish you a Merry Christmas and a Happy New Year."

These introductory words were followed by the president's comments on what to focus on and how to change to improve operations:

Change for Improvement

"The customers are becoming more and more at the focal point in the daily work, in the long term planning and in the development of our products.

We strive to do Right Things Right and our competence development is also a matter that our work will emphasize. To manage the increasing competition and to achieve continued success we must renew ourselves.

We suggest a development that will form a new culture in our company. The management, middle management and the unions agree on the need to change working methods and procedures, and to work in a more structured way. We have taken part in training and gained information from experience and success within several Swedish and foreign companies to find the best solution.

Our task is now to attain the highest quality of our work.

- *From the customer's order until the material is in the customer's inventory and the bill is paid.*

I am as president personally convinced that we have found the right tools to develop FSAB well. I am also satisfied with the fact that we have taken some steps on the way forward in our work. Now we will continue the progress. Thirty co-workers have developed drafts for FSAB's Vision and Operation. With these words, these proposals follow in their entirety."

The Company Vision, Mission Statement, and the five groups of policies developed were presented. An article written by the new personnel manager, employed in September,

described the plans for the competence development that was to take place hand in hand with TQM:

Competence development - hand in hand with TQM

”What is competence and competence development? Simply put, one can say that competence is basically the development of one’s own person.

One of the most important factors in being competitive is the personnel's competence. Competence development is a key to all change work together with quality thinking. This puts high demands on commitment and participation, but it also gives opportunities to e.g. both wanting and being able to take on new and broader tasks.

In FSAB, we intend to build the competence development around TQM. The TQM thinking is, among other things, founded on personnel who work in teams across functional boundaries. With a functioning team, work responsibilities and authority can be deployed as close as possible to the operative work. Everyone will, as time passes, have a greater sense of participation. Along with participation, commitment increases. Commitment results in motivated employees who increase the value for the customer.

Changes must be realized successively in even steps. It is important for the team spirit and for the individual that time is given for reflection. The change must be divided into a number of steps with clear sub-goals. For FSAB, it is important that everybody works in the same direction and with even steps and that you especially are a part of this effort!

It is therefore important that you yourself have demands. To demand is to be a part of learning, it is competence development. Traditionally, many employees expect that different training activities are the manager’s responsibility. Competence development means that the responsibility is divided between the members of the staff and the managers. The manager is responsible for the conditions regarding financial resources, time, and encouragement. It is you, however, as a member of the staff, who must push for your own learning and take initiatives. It is only you who knows what is needed in the own personal development.

It is important that a variety of activities is planned, both within and outside FSAB. Activities are to be available within three different main areas; Technique, Leadership and Personal Development. Many activities may be solved by learning from each other within the company. A mixed offer presents an opportunity to choose based on interest and working area. It is of extreme importance that you as a member of the staff give suggestions for training. We together must find the variety of training.

At present, there is no concrete competence development plan at FSAB, but there are plenty of thoughts and ideas. During the spring of 1996, a plan will be developed. During this period of development minor activities will be carried through, mainly for our managers.

With this said, I hope that you feel welcome to come with suggestions and ideas for training that you feel that you need.

I also hope that you don't "jump off the train and don't stand on the side waiting". It is your commitment that decides how well we succeed in reaching the tough goals that have been set. Now it is a matter for FSAB to create the right conditions, so that you can come along."

The personnel manager also introduced herself in another part of the magazine; she came from ABB Network Control, where her tasks concerned competence development, information and salary issues. She stated that, during 1996, the majority of her work would be dedicated to competence development, implementation of TQM, and other personnel issues of a general nature. She also stated that, for the other staff in the personnel department, the tasks would be basically unchanged as compared with earlier.

The personnel manager's article on competence development and its relation to TQM was presented adjacent to the Q&D Manager's description of how matters of quality had changed worldwide and in the Fagersta operations over the years:

From Inspection to TQM!

"The development from the Second World War with regard to quality matters and how to work on these matters has followed a common pattern throughout the world.

In the 1950s and 1960s it was mostly a matter of inspection of products before they were sent to customers, and to scrap those products that were not up to standard.

In the19 70s Quality Control continued the development. Here it was more a matter of controlling the production with the aid of modern instruments aiming to keep the amount of scrap in inspection as low as possible.

During the 1980s Quality Assurance had its breakthrough. By bringing order into different instructions and procedures, more efforts than before were made to ensure good product quality for the customer.

Thanks to the competition, Fagersta AB and, later, Fagersta Stainless have naturally also walked this path. Our efforts in Quality Assurance have since the middle of the 1980s resulted, as everyone knows, in Lloyd's approval of our Quality System to the ISO 9002 standard in February 1992.

During this long development, attention has mainly been directed towards product quality. The result has been major improvements since the work begun in the 1950s.

During the 1980s and 1990s some companies have taken a new step, not only devoting time to product quality, but also to other requirements and desires of the customers, e.g. assuring the supply of products, technical service, etc. These have been acted on as efficiently as possible by using all the resources available within the company. All employees have been engaged in doing the right things from the beginning and to continuously improving the way of working. This new way of working has been given different names in different companies, but the most common label has been TQM, which stands for Total QM in English or as we call it in Swedish, offensiv kvalitetsutveckling.

Many companies throughout the world have by this time taken steps towards applying this way of working and it appears that those who have succeeded (e.g. Xerox, Mölnlycke, Ugine) have certain things in common, namely six keys to success. Those keys and some examples illustrating their meaning are presented below.

***Customer Focus** means*

– *that we always make efforts to understand the customer's explicit and implicit demands, needs, and expectations*

– *that we always keep the promises given by our sales departments and others who are in direct contact with the customers.*

***Leadership** means*

– *that our leaders on all levels always show by their actions what is most important*

– *that all employees receive feedback on their performance measured in terms of quality and usefulness for the recipient in the next step in the chain.*

***Total Commitment** means*

– *that we build tight bonds with our key customers and suppliers so that everyone knows the demands and expectations*

– *that each and every person invests in competence development throughout the company in order to facilitate continuous improvement.*

***Continuous Learning** means*

– *that we invest resources in competence development throughout the whole company to facilitate continuous improvement.*

***Process Orientation** means*

– *that we investigate all our working processes (not only production) and how they are carried out in reality so that they can be improved later.*

***Standardization of Working Methods** means*

– *that we introduce similar facilities throughout the company and create improvements so that we have a common language across departmental boundaries. In*

this way, we can increase the understanding that "We" are FSAB and "They" are the competitors.

This is a summary of the meaning of TQM and some thirty employees in leading positions have been trained in the basics during the autumn. The teachers have been experts with great experience of what TQM means and how to implement it in a company. I f you want to know more, go to your superior."

Several other vital matters were also reported in the magazine. These were not reported as part of the information on TQM and the changes to new ways of working. It was a coincidence that they appeared in the same issue. A new company physician introduced himself. The construction of the expansion of the laboratory and conference rooms and offices was also presented. Four central motives for this expansion were presented in the article:

- The production inspection was previously scattered in the production areas and with the expansion this can be concentrated and handled more efficiently.
- The management of some of the production areas had poor environmental conditions which will now be improved.
- Neither of the adjacent production departments had a meeting place where they could hold meetings.
- The company health service will be in a geographically better position and be given better rooms.

Two other matters reported were the 1995 pensioner and veteran party and the party for those who received awards for proposals during 1995. In total, the recipients of the awards shared 630,000 SEK, and the greatest reward was 55,000 SEK. Some other information concerned a change in sickness leave payments and new premises and equipment in the laboratory operations directed towards product and process development. The latter meant that new computerized equipment with new opportunities replaced the previous 25-year-old equipment. In January, 1996, there was to be an open house for interested persons.

Finally, there was a report about a visit by German wire customers in September. The sales manager for the wire division described how FSAB's German distributor invited a group of customers to Sweden. In total, 117 persons from 11 companies came to see the

production from the steelmaking in Sandviken, where some of the raw material was produced, until the product was complete after going through all the steps in the production.

The sales manager described how a questionnaire on Sandvik/FSAB's total quality was distributed to the customers. The results showed that FSAB was perceived as better than the competition in the areas of market leadership/Assortment, production, technique, quality and quality assurance, technical support and personnel. The sales manager described that this meant that, in a long-term perspective, the customers' viewed FSAB as being their best partner. He also described that it was a gang of very pleased customers who, well fed and satisfied, returned home and that, thanks to this, a new dimension could be added to the product specification – namely CUSTOMER DELIGHT.

These latter reports in the magazine were not presented in relation to TQM, even though several were obvious practical examples of work in line with the intentions in FSAB's TQM concept. The articles by the president, the personnel manager and the Q&D manager together with policies presented etc. introduced TQM. Together with the two-hour kick-off ,TQM had been introduced on a wider scale, but it would take a while before most employees saw any implications at all of the TQM launch. There was still uncertainty among top management as to how to proceed; thus an agreement was made with the researcher that he would suggest an approach for the continuation of the TQM process during the spring of 1996.

TQM mobilization at FSAB

The TQM training so far could be regarded as a type of mobilization for action. However, the emphasis was still on organizing in theory and mobilizing resources for action. The training in a sense had been a mobilization of managerial resources for mobilizing operative resources internally and in the processes. There had been a kick-off and the staff was thus anticipating what was going to happen; the managers were the ones who were expected to make something happen. Soon after the initiation at FSAB, the researcher came with a proposal for how to implement TQM at FSAB. This section describes the proposal and what was happening in the TQM work after the kick-off and the introduction of TQM in the company magazine.

The researcher's proposal for implementing TQM

The researcher summarized the background of the continued TQM process and worked out a plan and strategy – FSAB's TQM process – for further development. In a fax to the Q&D manager on January 3, 1996, the researcher described the plan and initially stated what had previously been discussed:

> *"The objective of the developmental work is to form a new culture for FSAB where all employees' full potential is used to satisfy demanding customers' desires. This in turn requires that all employees are engaged in evaluating working methods and approaches, with the aim of accomplishing a more process-oriented, structured and learning way of working. This in turn requires continued competence development on all levels within the company."*

He then continued with a description of aspects that he viewed as important for the TQM process. In summary, he emphasized that:

- Initially, a number of persons need to learn and master tools and methods, enabling their facilitation of others in their start of improvement work; these persons, in their facilitation, also need training in how to facilitate group work since this was to be one of the cornerstones of FSAB's new way of working.
- The training would start at the top of the organization, letting managers develop experience in using tools. After this training, a core group of persons from different levels in the organization would develop experience in practical problem solving and improvement work. This core group of persons also had an important function in training the staff and facilitating different problem solving groups. By

being part of the implementation group, they had a forum for continual exchange of experiences and discussion of further development of FSAB's TQM process.

- A TQM process is not a ready solution that can be pushed onto the organization. It is a matter of a dynamic learning process, in which the contents will be continuously developed and modified in order to support FSAB's development towards the set vision, as well as a possible process that is followed according to the decided mission and policies.

- Individuals learn in different ways and it is therefore important that time be given to learn, to be critical, and to reflect – an absolute requirement still being that everyone test tools and approaches in their own work to gain personal experience.

- there is a need, in the whole company, to develop a common language, a prerequisite for a new culture. In order to succeed in the development of a common language, a common foundation is needed, when it comes to understanding the purpose of FSAB's development process, in which vision, mission, and policies are the basis for the development. If everyone in the company is to use the same language there is also a need for a fundamental understanding of, and attitude towards, development, learning and problem solving. This could be demonstrated by problem solving and learning cycles. A set of tools in which all employees have been educated and all have applied is also a common foundation. The possibility to practice what had been learned is crucial, however. If the opportunity to practice what had been trained did not exist the training should be postponed until this opportunity existed.

- there is a need to understand how a measurement system can lead to deployment of goals to everyone's workplace. As a start, the measurements on the upper level need to be further developed, e.g. customer satisfaction and internal climate, and these data are a very important element in the communication with all employees.

- regarding the implementation group, they should first be trained in the relevance of, and practical use of, problem solving / learning cycles. This would take place over two days, giving a deeper understanding of problem solving/experience/learning cycles and different system levels. The purpose is, at the end of the two days, to have developed the fundamental requirements for an "FSAB's cycle", that is, which stages should contribute in support of FSAB's systematic work.

In addition to the above, there were further descriptions of how a continued development of competence in TQM could take place throughout the company. This was divided into two steps: Step 1 (minimum level of training) comprised training for everyone in the company and certain special training for managers or facilitators, and was called a minimum level of training; in Step 2, the training was to be adapted to the needs of different groups. Each step was further described.

In Step 1, everyone should have: a two-day TQM introduction; a one-day training session in a problem solving circle and system levels; a one-day training session in process analysis plus homework, plus a one-day training session in fundamental problem solving tools: data collection, Histogram, Pareto, Fishbone; group work, roles in group work, process – functions, the facilitator role; and, finally, everyone should develop their own success stories – these could already have taken place, but should then be recognized. One example was an FMEA co-operation with a supplier where operators were involved and visited the raw material supplier. This was the start of co-operation at an operator level, which was perceived as successful. In addition to this training, the managers and facilitators in the implementation group would have a second day of training in problem solving circles and system levels, and training in management tools such as the Affinity Diagram, the Relationship Diagram, and the Tree Diagram.

For Step 2, some examples of training that different groups might need were listed: a one-day training session in policy deployment plus practical goal deployment; a one-day training session in understanding variation and control charts; a one-day training sesion in FMEA; a two-day training session in QFD with homework between the first and second days of training; a two-day training session in Design of Experiments, with homework between the first and second days of training; a two-day training session in benchmarking with homework between the first and second days; and, finally, a one-day training session in measuring processes and process ownership that required a process mapping that had already been done.

The researcher's facilitation of FSAB had so far been based on training and preparing a group of persons for the actual implementation of TQM. The role of the researcher now changed to be a consultant facilitating FSAB in its TQM process. His explicit role at FSAB was no longer only to coordinate and facilitate training in TQM; it was to actually facilitate the ongoing change process at FSAB. The researcher was involved in business transactions, in which he had a consultant role. The top managers at FSAB were dependent on the facilitation since they were not yet comfortable with what had been

trained; almost no actual integration of the trained tools, principles, etc. had yet taken place in the actual operations.

The first TQM steering committee meeting in context

The content of the training was perceived as appealing and several structural tools such as the tree diagram, the organizing for TQM, etc. had been incorporated, but now it was a matter of actually improving the operations using the principles and tools in the daily work. How to continue the work was a prioritized issue to be discussed on the first TQM Steering Committee meeting scheduled. The Researcher's suggestions were to be an input in this meeting. Another important matter – QS-9000 – was getting closer.

As the FSAB TQM Steering Committee had its first meeting, on January 16, 1996, QS-9000 was not a topic on the agenda. On the agenda were: (1) information on certain topics, (2) discussion of other topics, and (3) issues in need of decisions; the Steering Committee was to follow this structure using three different types of issues for all their meetings. First, the Q&D manager gave information about the action plan and progress, and the conclusion at the first meeting was that, so far, they were, on most points, following the plan.

The CAT projects that were defined during the seven-day TQM training and in a review of current projects were listed. The TQM Steering Committee discussed the strategic goals and decided to break these down into departmental goals. Another issue was the fact that the descriptions of FSAB's mission, vision and values presented in the company magazine had gained an unexpectedly low level of response. The group was not sure of the reason, but it was clear that there was a need for verbal departmental information, preferably with some internal examples from FSAB. The group also agreed that it was a good idea to have the researcher and the consultant from the consultancy firm that trained the participants in process improvement and management in the TQM training as mentors.

Another decision was that all department heads should inform their staff and present an opportunity to discuss the matters before February 15, 1996. Furthermore, the group agreed that the success tree should be translated into Swedish for internal purposes before the next meeting on February 15, and Champions were to be suggested for each of the five key areas. They also decided that 12 more persons, mainly operators, should be proposed for the implementation group before the next meeting. No decision on continued training was taken, but the next step was further training of the steering committee in February. In a twozday session, a group of key persons were to develop FSAB's way of working, an approach based on a learning cycle.

FSAB's way of working and a reflection on TQM

On February 8-9, 1996, a group of approximately 30 persons, including the top managers, took part in a two-day training session aimed at developing a systematic way of working. A colleague of the researcher facilitated the work. She was the head facilitator for the two days with the aid of the researcher and another consultant colleague. Learning cycles, with a focus on a Cycle of Experience,[8] were the foundation of the training, which comprised training in levels of systems and the Cycle of Experience, defined at FSAB as:

> *"A process through which humans, individually and collectively, become aware of what is going on in each moment, and mobilize energy to take Action, and then subsequently reflect on what has been achieved. This facilitates openness to new possibilities and constructive behaviour through new awareness (perceptions)."*

The president started the two days by presenting their goals and visions; the participants then introduced themselves, where they were at the current moment in the process and their perceived personal and group needs. After this, the participants discussed how the two days fit into the improvement at FSAB and different working methods. During this introduction, where people had an opportunity to express their views on the development, several critical comments on the work accomplished so far, related to their perceived needs, were expressed; several of the participants were hesitant and some were frustrated.

After the discussion the facilitators introduced different aspects of TQM and learning cycles, e.g. review models, use of different tools during different phases, examples of cycles, differences in application and driving force, strengths and weaknesses and limitations. A mini group exercise based on TQM and learning aspects followed, after which the Cycle of Experience was the basis for this training, Figure 5. The central idea was to infuse a way of thinking and acting, and to develop an awareness of one's own behaviour and what could be improved. In relation to the cycle, all the participants took part in an individual exercise analyzing, on an individual basis, at which stages they have their strengths and weaknesses.

[8] The cycle is based on the assumptions that: the supply of energy – irrespective of system level, the individual, dyad, group, organization, etc. – is limited, and is often blocked (by resistance) or tied up in "unfinished business" that we carry within ourselves; and that good contact and good relations with others are a foundation in life. The cycle was originally directed towards understanding individual behaviour but has been tested and developed to apply in organizational development (from training material used during the course).

After the individual exercise, the facilitators introduced different levels of work – e.g. individual, group, organization – which were also discussed. This was followed by a discussion and reflection on different resistances connected to another exercise, a group work on a certain task complemented by subsequent reflections on the work flow during the completion of the task. The participants discussed and reflected on steps that they might have skipped or carried out in a certain way, and various causes of resistance and blockages. After processing the cycle in different tasks, everyone reflected on their own normal way of working.

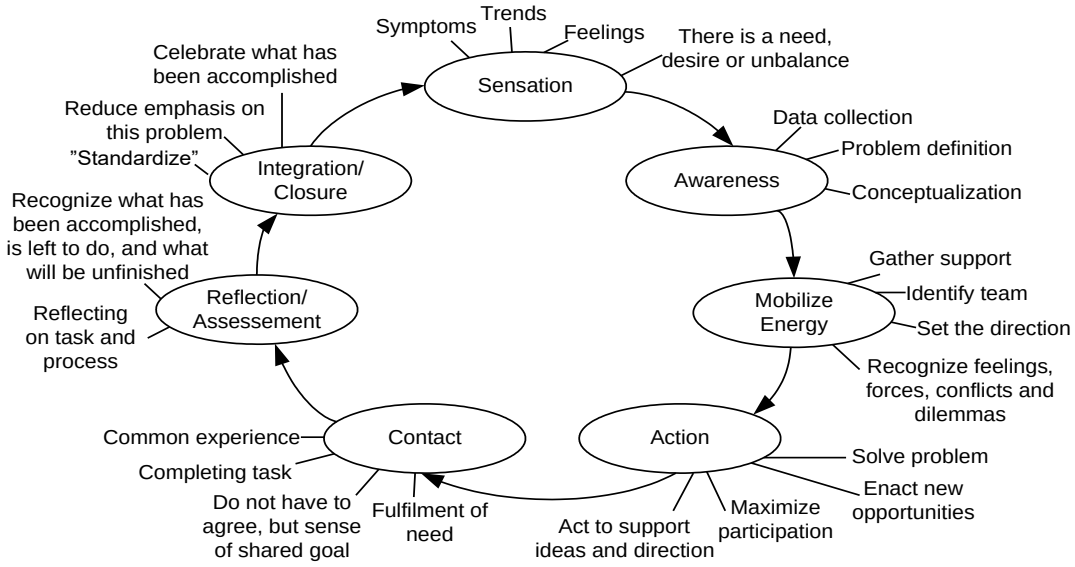

Figure 5 The Cycle of Experience as described in a folder from FSAB's internal TQM programme.

The first day was ending, but the participants were given an opportunity to discuss TQM and various issues related to the process initiated. The participants brought forward numerous arguments and issues, which the facilitators summarized. There were questions concerning the actual meaning of TQM, concerning an experience threshold and how to continue the work. A number of opinions were also brought forward, such as:

- TQM is on a pedestal.
- TQM is not formulated on paper.

- We talk about what we are doing – sharing it in the organization.
- We are not getting started in using the Q tools – there is fear and uncertainty.
- We have earlier failures (The Future Project).
- The work on goals is too slow.
- This is a natural way of working.

While some of these notes were difficult to comprehend, they represented a view of the topics discussed. In a subsequent vote among the participants on possible problems, the view was further defined:

- 18 votes for "No knowledge of tools",
- 6 votes for "We do not share what we do",
- 1 vote for "Goals for TQM",
- 0 votes for "Fear, uncertainty, insecurity in the organization".

The participants perceived that they needed to master various tools better. They had practiced tools but rarely used them in the operations, and a recurrent problem was that one attitude towards TQM was expressed during training and meetings, but, as participants returned to their daily work, most of it was forgotten.

The second day started with group work leading to presentations, a review of the work process and a discussion of the usefulness of the cycle. The participants discussed applications, phases and components of the cycle; they then worked in groups to solve problems that the participants recognized in their own work. During the work the essential elements and structure of FSAB's own approach to work were developed. The FSAB cycle would subsequently be designed on the basis of these elements and the structure - it took some time before the final version was set and the cycle became diffused in the organization.

The cycle was termed FSAB's Way of Working, but, as described above, it was referred to as The Circle ("Cirkeln"). The circle was diffused as a fundamental approach that should be applied to any issue. It was also used in the further training and in different matters in the development of quality management. However, not until later in the QS-9000 project was it incorporated as a major procedure in the documented QM system; the final version can be seen in Figure 6 below.

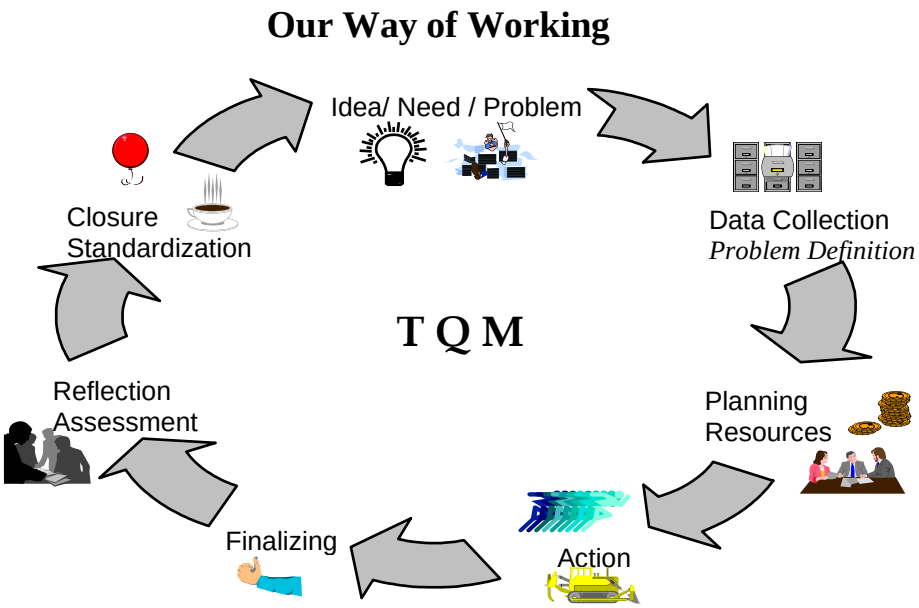

Figure 6 FSAB's "way of working" developed in workshops and diffused in the organization

An evaluation of learning cycles, reflecting on benefits and weaknesses, and a discussion of the two days completed the training. The participants gave a number of perceptions and, in general terms, they expressed:

- We must practice what we preach.
- For each project, we need to start with an explanation of how we are going to work.
- This concerns other matters than projects, but we need to start with the projects.
- The cycle of experience can be valuable as a model for evaluation.
- Day one was frustrating.
- It was worth the time.
- We have to be aware of the possibility of being interpreters for others.
- Show appreciation for others – in a personal and positive way.
- How efficient it is to work in groups.

They also commented on different matters perceived as important on a more individual level, and the facilitators summarized these during the session:

- Start to apply the cycle.
- Be aware of the different phases.
- Hang the cycle on the wall.
- The cycle should be diffused to everyone.
- Establish the cycle.
- Feedback / reflection.
- Integration, integration of learning.
- Useful to know how to use the cycle, how we have done so far and how we can do things better.

Finally, the participants agreed on three aspects they needed to focus on: prioritizing, a common language, and that they wished to have the cycle of experience to be second nature – quality and professionalism.

A top management reflection on the TQM mobilization

After the second day, the three facilitators, the president, the head of finance and the Q&D manager reflected on the two days, and the facilitators took notes. The following conversation is translated from the notes taken, hence, in some accounts, they are somewhat fragmented. However, from an overall perspective, they give a view of the conversation.

The president expressed that:

- in the end, as a whole, it was a success – these two days have brought us not only one step forward but two, three steps forward in how to work in the future. It is important to sort out and find facts. Therefore, it was good to sort out the questions: what do I want, what does the group need, as we started. Some complaints were expressed that we met. TQM will also be questioned in continued work.

- There was still great hesitance among the employees, the head of finance responded. We have a tremendous mission – but there is nothing to wait for. The managers who checked with their staff found that very few had read Stålringen (the company

newsletter). As we diffuse the vision, mission and policy, it must be done in a down-to-earth and concrete fashion, by exemplifying:

- Is there a problem here? the president asked.

- No, it's full speed ahead in this group of participants, but this differs from person to person, The head of finance responded:

- We don't know whether this is job oriented or prestige, as said by the Q&D manager. The training has been a success and beneficial, but not everyone in the group has done what they have said they would. On January 10, we decided to diffuse information verbally, but this has not been done – to diffuse what was described in "Stålringen" verbally. We must communicate and discuss. I have found something during these two days; I thought before that we had decent information material, but I realize now that much is missing. We must bring out actual cases. We do much that is not recognized.

- During these days, the president said, my best experience has been from examining things that have gone wrong - for example, how we handled processes in which we had no basis for taking decisions; you learn much from such cases; we should also bring such cases into focus.

- I mean that we should describe success stories – for example, the FMEA case, where someone who has been involved can talk about their work, the Q&D manager responded.

The FMEA case to which the Q&D manager referred was a project in which operators at FSAB started to cooperate with a supplier of raw material in order to solve problems.

- Success stories are a very important tool for reaching change in a company, the researcher said, commenting on the dialogue; another tool is to develop a threat perspective, which is to build on the scenario that Åke (the president) talked about yesterday evening, including the rate of development of the Asian competitors.

- I totally agree, the head facilitator of the two days said, this is very important. An observation I have made during these days has been that there is no sense of urgency to change within the organization. No one demands change from the individual point of view or from the organization as a whole. There are no signals, no data, and no requirements from any level in the organization.

- In terms of the threat perspective, the president commented, we have gathered facts, not emotions. The figures, however, are never 100 percent. We live in a rapidly changing world – you meet problems when everything is running smoothly. Facts present a

description of how it really is. Are we going to be able to keep up production? Humans are balanced and want to do something better, but sometimes when the question of whether it generates new jobs is asked, it may be the opposite - it may be necessary for survival.

- We have talked about benchmarking, the head of finance reflected, this could count for the staff too.

- We are trying to find something on the raw material side, which is not integrated today, but where the process will go from melting to finished wire, the president commented.

- Too bad that the union head could not take part, the Q&D manager reflected – meaning that he could see the whole picture. Someone should come in his place if he is not able to take part in both of the days.

- A possible continuation that could more firmly establish the tools could be to carry out an exercise where tools are used in sequence, e.g. the Compu Computer and their customer complaints (a case that the researcher used during training) that are treated by using Pareto, Fishbone, Relationship and tree diagrams.

These reflections thus indicate some thoughts in the top management as the TQM process proceeded. The main forum for reflection on TQM and addressing different issues was otherwise the monthly TQM steering committee meeting, following the agenda with the items of information, discussion, and decision. In this manner, issues that needed to be discussed, or decided upon, were separated from information issues. Information points could be reports on the progress of a certain project, reports from certain investigations or information from a certain course etc. Discussion points mainly addressed various problems in the development: how to solve them or the actual trying to solve them. Finally, decision points addressed issues that the steering committee should make decisions about.

TQM progress in a company context

The previous section described the more explicit TQM mobilization that took place so far at FSAB. It gave some idea of what was discussed at the time and basically followed a timeline. This section raises some thematic aspects that overlap in time; thus the timeline is not followed in the first parts of this section. An overview of the TQM steering committee is first given. The QS-9000 development and its contents are then overviewed, covering the US automotive industry's plans to diffuse this model for development in the supply chain. This is followed by a description of some of the contents of QS-9000 and possible implications at FSAB. QS-9000 became one of several so-called CAT projects, and this project structure and a number of projects are described after the sections that deal with QS-9000. A misalignment between the personnel and Q&D managers' work is then described before two days of further training, including a review of an assessment of TQM in August 1996 . After this, the staff training, a major project aiming at process-oriented improvement and a number of forces and activities, is covered in separate parts at the end of the section. Hence, it is a rather multifaceted section, and, in a way, it resembles the nature of the work.

TQM steering committee work

At every meeting, the progress related to plans and changes in the action plan were points of information. At the second meeting, the choice of the term TQM was discussed, and a decision was taken to keep the label and to emphasize that the focus was on changing working methods; other points of discussion were success stories, more information about TQM in the organization, and more spontaneous visits to the production by top managers.

Various aspects were continually brought up. At the third meeting, three information points were: the coordination of different forms and diagrams; the numbering of decisions to make possible efficient follow-up; and information on improvement groups in the wire division. There was a discussion concerning the risk of collision between the "my idea" activities and the improvement groups, and a discussion of different decisions. One idea was a reward system that, on an individual basis, recognized suggestions that improved operations. This reward system was very profitable for individuals who suggested, in a systematic way, improvements to production, but it was also a source of conflicts and a system that did not encourage group work.

Nevertheless, a decision was taken to keep the reward system, in spite of the fact that the researcher, in his article (Alänge, 1994) and in presentations, had emphasized the importance of aligning the reward system with the type of work that the organization

wished to facilitate. Furthermore, at FSAB, group work was supposed to be the fundamental approach to improvement. Still, this was a very delicate matter since several persons in operations would strongly resist a group-based reward system. The matter was to be examined and alternatives suggested, but no alternative was suggested.

In this manner, the members of the TQM steering committee brought forward problems, ideas and new topics, but it was problematic to get effective handling of delicate matters that were uncomfortable, such as the reward system. Either there was no change at all or it took considerable time to handle a certain issue; and some issues were not yet on the agenda. During this period, QS-9000 became a topic that was placed on the agenda.

The emerging QS-9000 topic

The QS-9000 requirements established in 1994 were the result of a six year long process of harmonizing the American automotive industry's quality system requirements and assessment tools. These requirements had been diffused to the North American suppliers. The foundation for the system was ISO 9001:1994, whose requirements were printed in italics while all the other text described specific QS-9000 requirements. The goal was to facilitate development of fundamental quality systems that could provide for continuous improvement, emphasizing defect prevention and the reduction of waste in the supply chain.

On September 11, 1995, a new working group in the Automotive Industry Action Group (AIAG) met in the USA. They discussed how QS-9000 could be deployed in the supply chain. The task force that developed the first edition of QS-9000, applicable to the tier-one suppliers, in August 1994 now wanted a method to consistently and efficiently deploy QS-9000 to the sub-tier suppliers. A work group, consisting of several tier-one suppliers, acted with a Quality Systems Requirements Task Force to develop a common platform for deployment. In this deployment FSAB would be one of the suppliers that met these requirements.

On January 8, 1996, all major tier-one automotive suppliers were invited by the Chairman of the Sub-tier QS-9000 Deployment Work Group to participate in the work. He had attached a suggested approach to deployment and stated that: "This is the direction in which the work group is moving…If you wish to participate in the work group, please submit all requests in writing to…" The chairman, as the final words in the invitation, wrote that "This is a very important activity that has huge industrial impact. Your involvement will help ensure a uniform and cost efficient deployment of QS 9000".

On February 14, 1996, the president and Q&D manager of FSAB received an internal memo sent within the Sandvik Steel Corporation. The topic of the memo was defined as: "QS-9000 – New Development, Proposed Tier Two Supplier Approval Policy from AIAG". Information on the development was enclosed and summarized. The suggested approach to deploy requirements from tier-one suppliers to tier-two suppliers, developed by the Sub-tier QS-9000 Deployment Work Group, was attached in the memo. A set of four common requirements had been defined:

"1.1 *The common quality system requirements will be Quality System Requirements, QS-9000 sections I and II as the minimum quality system requirements.* (section I was the common requirements and II contained the customer-specific requirements)

1.2 *The standard assessment document for first and second-party assessments will be the Quality System Assessment, QSA.*

1.3 *All first and second-party audits will be performed by qualified auditors. Auditor qualifications will be defined by the Sub-tier QS-9000 Deployment Work Group.*

1.4 *At this time, tier-one suppliers will not require that tier-two suppliers become registered by a third party* (registrar)."

Besides these requirements, there were rather detailed descriptions of the intentions to push the requirements down the supply chain. The above was to have an impact on QM in the steel industry as part of the supply chain connected to the automotive industry. The Q&D manager realized that he would again be under pressure to develop the QM in accordance with outside requirements. As the requirements in QS-9000 in many ways supported the direction of the TQM work already initiated, his perception was that this pressure would be a support rather than a problem. QS-9000 was becoming a theme in recurrent discussions, but the requirements did not have any practical implications within FSAB until the year after. In fact, the TQM progress was not a process with substantial practical implications; it was mainly a matter of coordinating, planning and discussing with minor implications in the action driven development. Some persons were applying tools, but still in a rather fragmented manner.

Potential implications of QS-9000 implementation

Aspects such as quality planning, approval of products, preventive methods, continuous improvement, and customer satisfaction were more heavily emphasized in QS-9000 than

in ISO 9000. In fact, QS-9000 not only comprised requirements; different related manuals were connected to the requirements to facilitate suppliers in developing their QM system. The manuals contained the terminology and several methodologies developed within the North American automotive industry. Suppliers were ordered to use the principles and methodologies within these manuals or to prove that they applied something better suited to their operations.

As part of the requirements, a separate manual defining a Production Part Approval Process (PPAP) had been developed. This was not a related manual; it contained well-defined and specific requirements with the purpose:

> *"to determine if all the customer engineering design record and specification requirements are properly understood by the supplier and that the process has the potential to produce products consistently meeting these requirements during an actual production run at the quoted production rate*."

It basically contained detailed requirements for development procedures for products and production processes, and on documentation from such work. It also contained requirements on documentation that the customers required as part of the product. Most of the documentation was to be sent to the customers, while other documentation may be retained at the suppliers' location. There was a default submission level, but it was possible to discuss and agree with customers on other defined submission levels. Another requirement that was imposed on FSAB by customers on several occasions was that a Quality System Assessment (QSA) correlating with QS-9000 was to assess the operations. The QSA most often followed the QSA manual that was part of QS-9000, but specific questions were often added.

The manuals within QS-9000 were referred to in the requirements to guide the suppliers as they worked out procedures and processes. In combination, the manuals in QS-9000 presented a number of principles and tools combined in a system that together formed an approach to company development. One of the manuals could be defined as being the heart of QS-9000; it contained guidance on Advanced Product Quality Planning (APQP) and how to develop control plans. It was a guide in working out a product quality plan that should facilitate the development of products satisfying customers' needs; the term product was used for both products and services. The goal of the product quality planning was:

> *"to facilitate communication with everyone involved to assure that all required steps are completed on time".*

The APQP was founded on a Plan – Do – Study – Act approach to development, and the manuals – covering Failure Mode and Effects Analysis (FMEA), Statistical Process Control (SPC), Measurement Systems Analysis (MSA) and PPAP – were referred to in the APQP manual. In the APQP manual, the PDSA cycle was called the "Product Quality Planning Cycle". The purpose of this cycle was according to the manual to emphasize:

> *"Up-front planning. The first three quarters [P, D, and S] of the cycle are devoted to up-front product quality planning through product/process validation.*
>
> *The act of implementation. The fourth quarter [A] is the stage where the importance of evaluating the output serves two functions: to determine if customers are satisfied, and to support the pursuit of continual improvement".*

It was stated that this cyclic view illustrated "a never-ending pursuit of continual improvement that can only be achieved by taking the experiences in one programme and applying that acquired knowledge into the next programme".

The APQP covered: (1) how to determine the customer needs and expectations in order to plan and define a quality programme; (2) how to design and develop the product based on the quality plan; (3) how to design and develop a manufacturing system, consisting of its processes, and its related control plans that could deliver a product meeting the customer requirements, needs and expectations; (4) how to validate the product and processes through an evaluation of a production trial run; and (5) how to evaluate the outcome of the production, as the product is part of the customer offer. It was not until the final stage, "when all special and common causes of variation were present" that the effectiveness and efficiency of the quality planning work could be evaluated. After each of the five phases the "upper management" was to be updated on the progress in order to to "maintain their interest, plus reinforce their commitment and support".

During each of the five phases, a variety of important matters were described and methods for facilitating the progress were suggested. In phase one, some key "methods" were: customer interviews and surveys, Things Gone Right (TGR) reports, Things Gone Wrong (TGW) reports, capability indicators, Quality Function Deployment (QFD), field service reports, benchmarking, reliability and quality goals, preliminary process flow chart, preliminary listing of special product and process characteristics and a Product Assurance Plan containing for instance a Failure Mode Analysis (FMA). In the other phases, other examples of methods, such as Design Failure Mode and Effects Analysis (DFMEA), Design for Manufacturability and Assembly, Design of Experiments (DOE), Process Failure Mode and Effects Analysis (PFMEA), process flowcharts, control plans,

floor plan layout, process instructions, production trial run, Preliminary Process Capability study, Production Part Approval, and Production Control Plan were suggested.

These were but some of the matters and methodologies covered and they have their roots in principles similar to those in TQM. In fact, QS-9000 was a set of requirements and connected methodologies aiming at facilitating a TQM development; this was very clear in a comparison with the TQM programme attended by the employees of FSAB. If QS-9000 had been in focus from the beginning, this would have been a different route towards a TQM company, compared to the process initiated at FSAB. The prioritizing of methodologies and activities would have been different and more in line with some of the requirements that were now forced onto FSAB.

On the other hand, QS-9000 was viewed by several employees as imposed requirements that one had to fulfil, ending up in superficial fulfilment of a set of requirements, similar to several employees' experiences of the prior ISO 9000 implementation. Another aspect was that an implementation of QS-9000 without prior understanding of TQM might lead to a development where the participants did not understand the underlying purpose of certain requirements.

There was still limited understanding of the actual demands that QS-9000 put on competence development within FSAB. The sales department and technical support sometimes, but seldom, met inquiries connected to QS-9000. The Q&D manager had a conceptual understanding and viewed a coming development towards QS-9000 as a major task in the future, but not now. The development of QM was focused on TQM, but there was still confusion and uncertainty about the use of tools, as a rather comprehensive project structure was defined.

The CAT project structure

The top managers prioritized a number of major CAT projects together with an inventory of other projects. Further projects were to be defined successively as different needs were identified. There are basically four types of projects, different in nature and focus. First, there were a number of technical projects that differed in their nature and focus; these were directed towards developing the production processes, developing the IT systems that facilitate the production process control, or towards offering customers new products. Second, there were administrative projects directed at developing the support of the operations and administrative tools. Third, there were projects that could be termed explicitly QM projects, directed towards analyzing and developing the QM system and the system of business processes that together comprised the FSAB operation. The administrative projects could also be viewed as directed at developing business processes.

However, while the QM projects were consciously directed towards developing these business processes, the administrative projects were more functionally directed towards a certain need. Finally, there were projects consisting of all of the first three types.

Some examples of the first type of projects - technical projects - directed at developing the production processes, were the projects : CAT811 Heat Recovery, CAT821 NOx-free Descaling**,** CAT823 DST Direct Solution Treatment, and CAT824 Salt Bath Descaling. In fact, a more administrative project by nature, CAT820 Application for Concession, can be viewed as this kind of project since it was a preparation for developing production. One project called CAT836, New Process Computer System, could also be seen as such a project, as its aim was to develop the IT system supporting the production process control. CAT808, Expanded Wire Rod Assortment, is yet another example, directed towards offering customers new products.

An example of the second type of project - administrative projects – is exemplified by CAT813 Clocking-in Card, directed at developing a new way of checking the work hours per individual and a development of wage administration. Project CAT805, Revision of the Salary System, phase 2, was another example of this type of project. It was directed at forming a salary system that facilitated the operations and the development of operations. Finally, CAT832, New Chart of Accounts, was an administrative project to work out an accounting system in harmony with external requirements.

An example of a planned third type of project - QM projects – was the project designated CAT834, Process Orientation of FSAB. This project was a direct effect of the TQM training programme that was facilitated by consultants from one firm involved in the 17-day TQM training programme. Another example was CAT814, Process Analysis: Testing aimed at analyzing the testing process in the inspection of the steel product quality; the results of these tests were one set of indicators of the production process capability with regard to a specific product. A project, CAT816, Competence Development, is an example of the fourth type of project, a mixture of the first three types. The next step in the TQM competence development was to further train the TQM Steering Committee in various tools.

TQM vs. competence development

Everyone in the implementation group who had not been involved in the prior training participated in a two-day training session on May 23-24, 1996 in order to learn basic TQM principles and tools; the participants were the persons within the implementation group who were not part of the TQM Steering Group. Everyone received an introduction to what had taken place to that time, the idea and content of the FSAB Success Tree and

the plans for future development. The FSAB way of working following the Circle, and how they could use different tools in different stages of certain work represented the fundamental part of the programme. After an introduction and lecture, the participants explored a toolbox with the seven QC and seven QM tools and practiced selected tools on a case (Compu Computers Svenska AB).

The personnel manager developed a three-year plan called 'Competence 98', containing a number of activities, among them TQM Implementation, Modular System. There were also numerous planned activities directed at e.g. increasing knowledge of FSAB's products, management training, operator and office staff training, and understanding the most important competence development areas and benchmarking.

The plans were based on an inventory of needs in the operations in combination with prior experiences from ABB, but the activities were not systematically connected to the development of business processes. Another fact that is noteworthy is that the TQM and the competence development plans were not in synergy. Several needs within the TQM progress were not yet acted upon in these plans for competence development. The plan for competence development had its own foundation and agenda and, on this agenda, TQM was one "module" instead of being the infrastructure for progressive work. This was in line with TQM's role at the personnel manager's previous employer within the ABB group. At this company, TQM was implemented as one part of a larger programme, which was not the case at FSAB, where it had been chosen as the comprehensive guiding approach to company development.

No one, including the researcher, recognized this gap in perspectives at the time. The researcher had a feeling that his and the personnel manager's perspective were not quite consistent, but the competence plan that the personnel manager had worked out was not a matter that he attended to. His view was that competence development should be one supportive part in QM development. Neither the president nor the Q&D manager perceived that this gap could be a problem; it was rather natural that the personnel development programme was the personnel manager's responsibility, as these types of issues were within her functional domains. Consequently, the Q&D Manager planned and coordinated the topics of the competence development within TQM.

Besides the existing competence development plans, outside pressure to learn more about QS-9000 was evident. The requirements were discussed, and, in the middle of 1996, the Q&D manager was convinced that FSAB had to plan for the implementation of QS-9000. The standard was based on international requirements in ISO 9000, so several persons at FSAB were familiar with much of the terminology and many of the requirements. There

were also substantial specific automotive industry requirements and, as awareness grew, it was evident that this would require a much more comprehensive quality system. The scheduled TQM training was not affected by this, however.

Further training and assessment of TQM

On August 15-16, 1996, the TQM Steering Group plus four other persons participated in a two-day training and reflection session. The focus of these days was to recapitulate what they had done so far, assess the current situation, and further train participants in the Circle describing FSAB's way of working. The researcher had prepared a slide with different tools related to each of the seven stages in the Circle shown above. The intention was to act on the fact that most persons at FSAB were still unsure of how to use the tools in a systematic way, following FSAB's way of working. As the researcher discussed the tools in relation to the slides, many participants indicated that they got a better sense of how to work.

On the second day, the participants used the KJ Shiba Method, a refined affinity diagram methodology, to analyze "what has been the major barrier in the FSAB TQM process". They worked in four different groups and the four subanalyses resulted in four major issues perceived to hinder the TQM process:

1. *One's own behaviour – how we as leaders act;*

2. *Lack of time – what and how we as leaders prioritize;*

3. *Imperfect information (obscure results, problems in prioritizing, etc.); and*

4. *Unchanged routines – we still live in the old culture while we at the same time wish to add the new (instead of replacing the old with the new).*

After this analysis, the second day ended in a discussion on how to proceed in the TQM process. The next step was to train the staff, more than eight months having passed since the kick-off in December 1995, and it took another two months before training started.

TQM employee training and improvement groups

During the period October, 1996, to February, 1997, the Q&D manager and the researcher met all staff in different sessions, except for the implementation group, in a six-hour introductory training in TQM. With few exceptions, the president introduced the sessions by explaining why he fully supported this work. The researcher and Q&D manager then held the training session together, involving one process engineer who was

involved in the development of maintenance. He presented an improvement project from the Wire Rod Mill, in which over 120 suggested improvements were defined and acted on by an improvement team. This was one successful improvement project presented, but most managers did not involve their staff in continual improvement work. Instead, they were either working heavily as usual in the daily operations or were caught up with other issues. A few managers, however, tested different ways to implement what had been learned. It was not easy, since attempts to act in a way outside "normal" behaviour met with scepticism or even cynicism in the operations.

Nevertheless, all managers were forced to start local improvement groups involving every operator and all the office staff; improvement groups were successively defined within all departments in the company. Some improvement work was initiated, but no CIT projects, defined during the training as part of the approach for development, were ever developed. And, in fact, the improvement groups never became a natural part of operations, which gave many managers a bad conscience as the top management pushed this issue; continuous work in improvement groups did not become a priority matter on most managers' agendas. Moreover, in practice, few changes were made that could signify actual changes in approaches. There were many plans, technical projects and some training, but no practical changes in e.g. working hours or shift forms. The top management pushed the issue to develop improvement groups, but they did not act in practice to facilitate this work, other than by supplying some training.

The business process improvement project

During the spring, there was also a continuous discussion about a process oriented improvement project, and the suggested mentor from the consultancy firm facilitating process improvement and management sent a quotation as a basis for a dialogue between the president and the Q&D manager. They were not convinced that the consultants were flexible enough; the offer contained many issues that FSAB had already covered in the TQM process. After internal discussions and consultation with the researcher, they decided to start a project.

In parallel with employee training, the business process improvement project was realized. The consultancy firm, as mentioned earlier, was a subsidiary of a US consultancy firm. This firm had, since the mid - 1960s, developed tools addressing performance problems and opportunities in organizations; during the 1970s and 1980s, they successively developed a methodology to facilitate a system perspective in organizations. In 1984, the consultancy firm, in association with Motorola, developed the

core process improvement and management tools that formed the basis for the work at FSAB.

In the autumn of 1996, a steering committee of nine persons, including all the top managers and other key managers for the task, was defined. The consultants facilitated a work flow where the participants: (1) defined current and future business environments, (2) identified Critical Success Factors (CSFs) and (3) Business Processes that were related to each other, (4) identified and profiled most important business processes, (5) identified strategic objectives and (6) worked with strategic change focus/Critical Business Issues (CBIs). With this as a baseline, the process actions were determined and a process improvement and management plan was developed.

Three CSFs were identified as focuses for the project and termed: (1) New strategic thinking connected to objectives, (2) Wire Rod and Wire 2000 (the objectives and visions for 2000 developed during the TQM work), and (3) Reduced cost of processing. These three CFSs were partly founded on prior TQM work, and they were to be the foundation for the coming analysis and developmental work and the baseline for a defined CBI:

> *"With new strategic thinking, the customer in focus, investments in our personnel and new techniques we shall reach the objective of reducing the costs of processing and, with that, increased competitiveness."*

The CBI was defined by the consultancy firm as a problem or opportunity that was decisive for a specific company's success; it could be the difference between today's performance and what the company wished to achieve; it could also contribute to an organization's development in a situation where the company did not have problems but wished to develop its processes; finally, it could be an opportunity that would appear in connection with major changes. When this CBI had been defined, the "Core Processes" of the organization were identified and goals and CBI connected to these processes. Then, after the work process had been clarified, processes and their relations had been described and project goals had been defined, a project plan was developed.

A "design team", including 14 persons with different roles at FSAB, thoroughly analyzed three business processes: the quoting process, the order process and the production process in the wire rod and wire production. The delimited purpose of the project during the autumn of 1996 was to identify, describe, improve and document these three processes. The Q&D manager was identified as the "project sponsor" for the project, and a project plan was defined for the work from the beginning of September until December 20, 1996.

Progress was continuously documented and, in December 1996, a folder with the project documentation presented the work process and results achieved to that time. For each of the three business processes, the documentation of the work was divided into six parts: (1) an "Is" map describing on a very detailed level the current work flow and identifying problems in the process; (2) a list of identified and prioritized problems described on one or several of three levels, organization (O), process (P) or a job/man (M); (3) a summary of the problems showing how many in total, how many of each type, and how many that are prioritized; (4) a list of identified root causes discussed in the design team and in the subsequent Steering Group meeting; (5) a summary of prioritized problems; and (6) a list of proposed process measurements and the current performance, if measurements were available. In this work, no tools for root cause analysis learned during the TQM programme were applied, even though some tools were perfectly suited for such an analysis. The only tools applied were the methods the consultants used in their tool box for facilitation. The next step in each of the three processes was to define current conditions that should guide the development of a "should" process. The design team, facilitated by consultants, identified three aspects that together set the fundamental conditions for the development of a "should" map:

"1. a number of assumptions that put demands on the process;

2. a set of characteristics of the process that can handle these demands; and

3. the demands on the "should" process. "

If necessary, a description of delimitations/limitations complemented this system of information. With this as a baseline, a Process Measurement System was then developed and a number of locations in the process maps were identified as measurement points with attached goals.

The results of the project were presented in December 1996 in an executive summary. The introduction stated that the work had been signified by high commitment and a strong will to achieve improvements of the flow driven towards the strategic change focus (CBI); the current business situation was compared with the one predicted in 2001, which depicted three times as high a turnover. This was followed by a discussion of the potential in suggested changes and summarized in relation to estimated monetary gains. Finally, the suggested process measurement system was presented.

Thirteen Process Improvement Recommendations (PFR, Förbättring = Improvement) were suggested, e.g. to describe FSAB's competence as it should be; to develop a prioritizing support for decision making; to develop a process driven measurement

system deployed at organizational, process and worker levels; to develop a reward system supporting FSAB's strategic change work; to gain an overview of FSAB's total layout with the purpose of supporting the process orientation; and to maintain an overview of the support functions.

Later, in March 1997, the 13 proposed PFRs were to be evaluated and activities identified that would change the operations into an identified "should be" state. All the proposals and a maturity – impact analysis were summarized in a report; this report also attended to the identified CAT projects and QS-9000. The consultancy firm recommended, in a final version of a suggested change plan, that the different CAT projects and QS-9000 should be integrated. In the case of QS-9000, they clarified that it was necessary to make a thorough analysis, as the scope was unknown.

A combination of forces and developmental activities

Process orientation of FSAB, outside forces to adopt QS-9000, the initiation of the work to develop and implement an ERP system adapted for the steel industry, and a set of other more concrete projects were all in progress at the same time. A decision to seek QS-9000 approval was taken by the top management group in January, 1997, after an assessment of which measures it was necessary to take to ensure approval and which sections of the company would be most affected. From the business process perspective, developed in the process improvement project, all these projects were part of eight areas of change, containing strategically important projects. From a QS-9000 view, these projects were related to a number of requirements and needed to be seen from another perspective. One important matter was how the projects were conducted. Furthermore, process orientation was part of the TQM plan, but contained in itself an approach that was very comprehensive.

Still another perspective of the needs for the development came from the personnel department. The first of three phases in a planned staff training programme was about to start, and, at the same time, there was a leadership training programme to be implemented; both programmes were initiated by the personnel department in a dialogue with the president and another consultant. One advantage of this consultant was that she knew the community from having lived there; she also knew Finnish and the Finnish culture,e as she was from a Finnish family and there were many Finnish employees at FSAB. The consultant was engaged by the personnel manager and the programme was planned separately from the TQM programme. Even though she was to be part of the continuing development, the facilitating consultant never met the researcher, who was

mentor in the TQM process. In fact, the researcher did not know anything about this programme, which was explicitly aimed at supporting the TQM progress.

The plan was to have one theme per year in the staff training over a period of three years. All office and operator staff were to take part in the programme. The personnel manager and the consultant executed the first theme of the programme in the spring of 1997 under the heading: “change presents new demands on personnel”. During the first theme in 1997, several of the employees expressed massive critique of the management of the company and extensive frustration was vented.

One issue was constantly raised as a negative example of these kinds of initiatives being meaningless; it was referred to as “Lindgården” which was the place at which the seminars in the Future Project were conducted in 1990. Thus, seven years after this initiative, the employees expressed substantial frustration. The personnel manager and consultant even had to fetch support during one of the more infected meetings. The Q&D manager was called in to explain what TQM was. In summary, the participants expressed their low trust in the management, lack of information, deficient participation and that motivation was low among several of the employees.

A complicated situation evolved for several managers and other key persons involved in several developmental activities. They took part in a leadership programme, in the development of new behaviour in line with TQM, in several technical projects and in the ERP project that had been initiated; in addition, besides the QS-9000 requirements that had originated in the US, there was a similar system of requirements, VDA 6.1, that the German automotive industry had developed; the German steel industry was also placing demands on FSAB’s QM system via this system of requirements.

VDA 6.1 was similar to QS-9000 on several accounts, but it also contained specific requirements not covered by QS-9000. Furthermore, it emphasized certain aspects in another way; some aspects emphasized differently, were financial planning, product safety, company strategy and process development. VDA 6.1 was also based on another way of assessing and evaluating a company’s QM system. Related to the QS-9000 project, a dialogue emerged concerning VDA 6.1 and as to whether FSAB should also strive for VDA 6.1 registration. No decision was taken, but FSAB’s operations were to be audited with regard to these requirements after the summer of 1997, and the requirements from the German industry needed to be recognized in the upcoming QS-9000 project. Extensive work to fulfil the demands posed by the US and German automotive industries lay ahead; QS-9000 was decided to be of the highest priority at FSAB, together with the ERP project, which would cause FSAB much difficulty.

In the evaluation of ERP alternatives, people in an evaluation group brought up some of the problems in the chosen solution. These problems and others would subsequently appear. The majority of the persons evaluating alternatives were initially against the purchase of this ERP system. On a meeting, however, the supplier showed a demo of an intended new and better adapted system. Moreover, another steel company, AST, agreed to be part of developing a new ERP system specifically for the steel industry. In this situation, the persons evaluating the new IT system still voted in favour of the system because they could not see a better alternative.

The ERP project was problematic from its start. In fact, already by the autumn of 1996, the ERP project leader did not want to be involved in it. He felt that no one else was committed to the project and that, in practice, it was very difficult to get suitable human resources for the project; and some said that this was "some new garbage that the management wants to start". There was great resistance to the new system, and the first year of the project was very slow in progress. One of the few persons that expressed some optimism was responsible for developing a lab module within the ERP system; he also sensed that there were several problems in the proposed ERP system that was to be developed, but he was also curious and saw opportunities in new ways of working in some processes.

The mistrust and criticism of the ERP project continued throughout the project, the main reason for the resistance being that the new IT system was not seen as being suitable for the steel industry and that the persons who were to work in the system did not feel that it was user-friendly. However, the supplier asserted that a more user-friendly and object-oriented version would come in a later version. In the version developed and implemented at FSAB, it was necessary for the user to make several extra activities in using the system, as compared with the older system that had been developed internally.

The ERP project leader assumed that the supplier would develop a new IT system, aided by the personnel at FSAB who had been involved in developing the prior IT systems at FSAB. In practice, however, the persons responsible at the supplier developed a system based on a platform from another version developed for the pulp and paper industry. The feeling that the ERP system was unsuitable for FSAB was a recurrent topic; the agreement with the supplier was that it would be a system with the same functionality as the old one. The persons who were involved did not perceive that this was the case, however, and great skepticism and mistrust grew as the project proceeded.

The ERP project was problematic and was to become more problematic. The German automotive industry imposed its VDA 6.1 requirements, which would be addressed

within the QS-9000 project, and the TQM process was stalling. The QS-9000 project was actually seen as a strategic one that would fuel the TQM process as well. Furthermore, several important and complex technical projects were on the agenda, and some of these ran into trouble. In this context, the process improvement project went into a new phase, and the plan was to launch further training and development work. Hence, it was difficult to understand the conditions as the QS-9000 project started.

TQM and the QS-9000 project

As can be seen in the above descriptions, there were both internal and external forces that contextualized the quality management work that was going on. Furthermore, there were a variety of developmental activities competing for attention, even if they were part of a broader TQM umbrella. There were numerous agendas that were behind the intentions of the actions taken; for example, the consultancy firm facilitating the process improvement project naturally had their agenda, The ERP project leader had his agenda, the consultancy firm selling the ERP system had its agenda, the personnel manager had her agenda, the Q&D manager had his agenda, etc. In all this the work was also infused by several power struggles. It is in this context that the QS-9000 project started, and it is in this context that the TQM work continued.

This section describes the development from the first steps in the QS-9000 project until FSAB achieved its QS-9000 certificate. The path towards the certificate was filled with several other matters such as the emergence towards closing the process improvement project and a quality audit based on the German automotive standard requirements, VDA 6.1. The description covers the planning, training and coordination of the QS-9000, the relation between the TQM work and QS-9000, how the awareness of QS-9000 grew and an overview of implementation issues and the main contents of the effects in changed working procedures.

The first steps in the QS-9000 project

The Q&D manager believed that it was necessary to start the QS-9000 implementation prior to any acceleration in the number of formal requirements; he anticipated a development similar to the one they experienced in conjunction with ISO 9000. Furthermore, the researcher, president and Q&D manager were bothered by the fact that the TQM process was stalling. They sensed that FSAB needed someone who could boost the development on a more regular basis. A QS-9000 project manager was engaged on a project basis with the aid of the researcher. He started on 20 May, 1997, was previously trained in TQM by the researcher and had at the time recently facilitated process analysis at Volvo Cars. The intention and hope was that the new project leader would lead the implementation of QS-9000 while facilitating the TQM process.

The QS-9000 project manager had no prior experience of QS-9000, but his plan was to apply the kind of process-oriented approach applied at Volvo. He was convinced that the approach would also suit the assignment at FSAB, but he did not know that process mapping had been used in two different ways already at FSAB, in the process improvement project and in the ERP project. The first step taken to increase knowledge

of QS-9000 and the awareness of its implications was to visit two automotive suppliers that already had QS-9000 certificates. He visited Bulten Production AB together with the person who was in charge of the administration of the QMS at FSAB. They had a very informative day at Bulten Production. However, it was evident that the conditions and manufacturing processes at FSAB were not the same as those at Bulten Production. The other company visited was SKF, where further information and complementary perspectives were given.

The QS-9000 project vs the process improvement project

The QS-9000 project manager knew that some kind of process improvement project was going on, and he was invited to take part in this work in June, 1997. The invitation concerned an analysis of the different improvement areas found in the process analysis project. Eight main change areas, see Figure 7, had been defined in which a number of CAT projects, including QS-9000 and ERP system implementation and 13 PFRs (process improvement recommendations), were incorporated as parts of a total change plan.

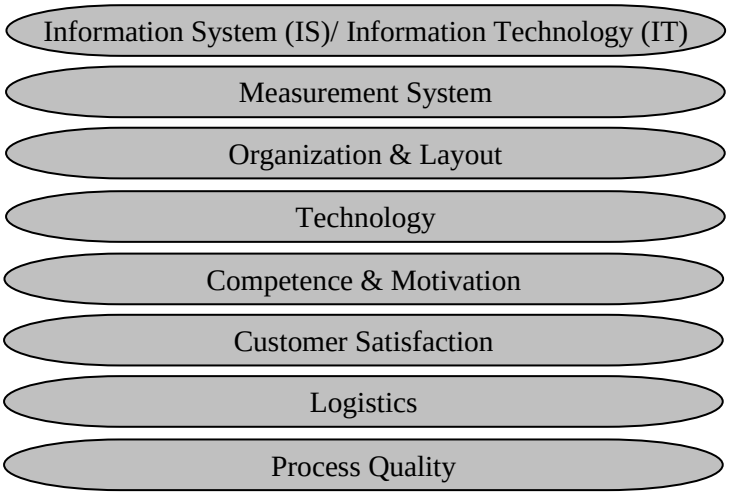

Figure 7 The eight improvement areas – called the Eight Pipes – identified in the process improvement project

A change leader had been proposed for each of the eight areas. The ERP project was incorporated in the IS/IT improvement area, and the QS-9000 project was incorporated in the process quality area. The QS-9000 project manager argued that QS-9000 crossed all eight areas and that an effective implementation, driving the TQM process and forming a "living system" and not only formalities, required a different view of the project than incorporating it in one of the change areas. None of the participants argued against the QS-9000 project manager's comments. Nevertheless, the consultants facilitating the

workshop were reluctant to change the model and its contents. QS-9000 stayed as one of two major parts in the process quality area; the other part in this area was to optimize the return on raw material for the production of wire rod.

The participants conducted an analysis of the current "is state" and a planned "should state" for each of the eight areas, and activities were identified that should lead from the "is state" to the "should state". In the case of QS-9000, the project leader had so far gained an overview of the requirements and the TQM work. Other stakeholders had only a superficial idea of what QS-9000 was, or no idea at all. Hence, the analysis was founded on some sort of preunderstanding of QS-9000 and the implications for FSAB, not on a profound understanding. Furthermore, this understanding was focused on the requirements rather than the practical implications in the operations. The resulting change plan related to QS-9000 was on a general level and did not contribute to the actual QS-9000 development. On the contrary, the fragmented perspective of QS-9000 frustrated the QS-9000 project manager and the time spent on the process improvement project was basically a waste of time.

The change plan was comprised of the various projects connected to three "shifts" and scheduled in a timetable from 1997 to 2001. These shifts defined milestones where certain objectives within the timetable were to be reached. In the first shift, for example, FSAB received its QS-9000 certificates and the ERP system was running; in the second shift, there would be 100 % delivery precision to customers, measured per day; and, in the third shift, the wire production would reach a final stage in a production development plan – Wire Production 2000. A maturity/impact analysis was carried out to analyze how ready various departments, customers, agents, etc. were for the suggested changes, and what impact the changes would have on them. In the case of QS-9000, this analysis, again, was based on a rather limited understanding.

In August 1997, The president and Q&D manager received a new offer for the continuation of the process improvement project. The change plan, developed in the process improvement project, was the foundation for the offer, but it contained other aspects than implementing the change plan. Although the president and Q&D manager at FSAB had expressed that they wished for a practical approach adapted to FSAB's current status, with prior TQM training, the offer comprised substantial training activities.

The president and Q&D manager had previously discussed that they perceived the consultancy firm to have a tendency not to be flexible enough; they had had, as described above, a previous discussion with the researcher concerning this matter during the spring of 1996. This lack of flexibility was also evident in the previous discussion of the change

plan with regard to QS-9000 and frustrated the QS project manager. He saw an opportunity to gain a facilitating force in the QS-9000 project, but he was now convinced that he would not get that support from the consultants facilitating the process improvement project.

Organizing for QS-9000 implementation

The QS-9000 project manager and several others needed to develop a more fundamental understanding of QS-9000 and internal auditing based on this system of requirements. The QS-9000 project manager attended the only internal auditor training in Europe authorized by Chrysler, Ford and GM. It was a three-day training course, outside Birmingham in the UK, on 17-19 June, 1997, covering all aspects of QS-9000 in general terms and internal auditing more specifically. Three days on such a comprehensive system of requirements gave an introduction, but much work was left to really understand how to develop an effective QM system based on QS-9000.

A more fundamental understanding did not grow until the work to adapt the internal procedures and approaches to the QS-9000 requirements was initiated. As the assessment of the way of working today with regard to the QS-9000 requirements started, layers of understanding were successively added, in co-operation between persons with different roles and competences. A network of internal and external persons continually developed this understanding by reflecting together on different requirements and their implications and on different actions that could be taken. Several of the external colleagues within this network were contacts whom the Q&D manager had known for years in long-term contact concerning various quality and development issues and external audits. The QS-9000 project was still in the planning stage, successively involving more and more persons who would be affected by the new requirements. Another ongoing question for reflection concerned how much support there was at FSAB for running a QS-9000 project.

He perceived that there was good internal support for the QS-9000 project, and different managers prioritized resources to support the progress. It was rather evident that some important customers were driving the issue of QS-9000. A project group containing the division heads, the production managers, technical specialists and staff from the quality department managed the project. The group met for the first time on 3 September, 1997. This meeting can be viewed as a first step towards finalizing the planning of the project; all the central human resources had been identified and involved.

The plan was to incorporate QS-9000 via the ongoing TQM process and existing forums. In practice this was not achieved. QS-9000 contains many special requirements, and the

project work conducted in special constellations was specific to the QS-9000 project. Nevertheless, the basic approach to organizational development that had been trained was a valid input into the QS-9000 progress. Several members of the organizations were familiar with an approach to successive and continual development in line with the intentions of QS-9000. The most time consuming work was how to interpret and adapt extensive requirements and the organization. While some of the tools and approaches required in QS-9000 had been addressed earlier in the TQM progress, many had not yet been addressed.

The Success Tree, the Circle, the Policies, etc. were to be integrated along the way and they would all be fundamental parts of the documented QM system. It took some time, however, to learn how this could be done. Furthermore, the person who had the role of administrating and coordinating all documentation in the project had been part of building the document system as it was at that stage, and he was not very motivated to develop a new structure. He was very knowledgeable in the old system, and it was also evident that this was a person with great knowledge of FSAB operations. The QS-9000 project manager sensed a need for rather heavy restructuring and development of the document system, while the person responsible for these tasks had the old structure at his fingertips.

The goal was soon to develop a new process-oriented structure, and, to achieve this, the QS project manager believed that there was a need to hire an outside person to replace the coordinator of the documentation in the project. A person was hired, on a project basis, to administrate and coordinate all the documentation in the development of the QM system; he had a central role in the QS-9000 project. The daily coordination and maintenance of the QM system was still the responsibility of the internal coordinator; the externally hired person had the role of coordinating and being a speaking partner in the development.

An analysis of which specific responsibilities were needed in the project defined the QS-9000 project group; there were a number of areas of responsibility in the project. Both division managers were responsible for ensuring resources for the project; the hired coordinator for documentation was responsible for all the documentation, while two production managers were responsible for managing the development of previous and new routines in the production, and taking necessary actions. A person with fundamental knowledge of the production processes and quality control at FSAB was responsible for developing a process for Advanced Product Quality Planning (APQP) together with the QS-9000 project manager. Three engineers were each responsible for either developing FSAB's Measurement Systems Analyses (MSA) on a production level, performing Process Failure Mode and Effects Analyses (PFMEA) and Statistical Process Control

(SPC) on all parts of the production, and developing control plans based on the PFMEAs. Finally, the QS-9000 project manager was responsible for managing the overall project, coordinating a quality system assessment (QSA) and leading the development of a production part approval process.

All members of the QS-9000 project group were co-drivers with specific responsibilities, and the project group was to be recurrently adapted to perceived needs along the way. Nevertheless, the QS-9000 project manager, with three days of internal auditor training, was the only one in the project group and in the company with formal training in the QS-9000 requirements. It was clear that several key persons responsible for developing processes and routines conforming to QS-9000, needed training. A three-day training session for a group of 20 persons including the whole top management team was planned. The QS-9000 project manager specifically asked for the same trainer who held the course in the UK.

There were also recurrent external audits by third party auditors or customers and quality system assessment forms sent by customer that were to be answered and returned. One audit that had an impact on the QS-9000 project was a VDA 6.1 audit, October 1-3, 1997, initiated by German automotive suppliers; the QS-9000 project group discussed the advisability of working towards a VDA 6.1 registration as an integrated part of the QS-9000 project. The requirements were largely similar to those in QS-9000, but there were some important differences and, in practice, this would take further resources for the administrative tasks of gaining a certificate.

The VDA 6.1 audit

Certain customers had handpicked the VDA 6.1 auditor since he was perceived by these customers to be very competent. In summary, the VDA 6.1 auditor's comments on FSAB documentation of the QM system indicated that his perception was that FSAB had a well developed and documented QM system; it was, however, clear that there were many complements to existing routines and several new routines that were needed in order to comply with the VDA 6.1 requirements. He stated in his report that, for a first VDA 6.1 audit, the status of the QM was good. He also expressed the opinion that FSAB had, in the best possible way, organized and prepared for a QS-9000 implementation. After three days at the company, he stated that he had gained the impression that the total management of the company supported the intention to develop a "living system", that it was not merely a formality.

The auditor further stated that the plan to achieve this living system was convincing, and, while it would be possible to achieve a registration earlier than at the end of 1998, the

plan was clarified by looking at the background; FSAB did not primarily aim for a registration, but for a living system comprising all employees, and, to achieve this, time was needed. He further wrote in his report that it had also been stated (by the managers of the QM development) that reaching a truly living system would probably require two to three more years, after registration. The audit report contained comments from three very intensive days, comprising all aspects of a QM system and some other issues; it was an important piece of information in the QM system development. Furthermore, several managers participating in the QS-9000 training had been involved during the audit in dialogues concerning issues that had previously been presented or discussed during that training.

The three days gave new insights and perceived possibilities, but VDA 6.1 still presented another development model, with its specific requirements. Thus, there was a complex of development projects going on within different types of models. The former ISO 9002 formed one type of model; TQM formed another; the process improvement project had emerged into a third; the ERP project formed a fourth type, with its opportunities and constraints within the software; the technological development managed by the engineers could be seen as a fifth type of model for development; the competence development programme based on its own agenda formed a sixth, QS-9000 a seventh, and now VDA 6.1 presented yet another model for development.

These models were based on both similar and diverging principles incorporated in differing structures, terminology and means. Besides this, the Board of Directors naturally had its agenda or agendas, and different persons and groups had their own individual agendas and models. If one looked into a certain area of the operations one would find other models for development based on other individual or collective ideas.

As one person at FSAB gained a first introduction to one of these models, some key points were often presented. However, as one took one step further in scrutinizing the content, a more complex structure of principles and tools emerged. Many persons did not seem to have a chance or the patience to take this step towards a more fundamental understanding. A limited number of persons were nevertheless inspired, seeing opportunities and new ideas and a way to realize principles and ideas presented. However, on most occasions after a course or other forum outside the daily operations, these individuals were drawn into everyday behaviour as they returned to their daily work. This was a challenge in both the QS-9000 project and the continuation of the TQM work.

QS-9000 Planning and the TQM progress

A few days after the VDA 6.1 audit, 20 participants took part in the planned QS-9000 training. The training took place at FSAB during 7-9 October, 1997, and was much appreciated even though the QS-9000 project manager received some critical initial comments on the fact that the course was in English and that some thought that it was rather difficult. After the course, FSAB had a number of persons who were familiar with the nomenclature and structure of QS-9000. This also opened up opportunities for developing an internal auditing system in which several key persons in the organization were involved. Thirteen of the 20 persons attending the course took an exam to become a certified QS-9000 internal auditor. Seven passed the exam, of which one was an invited quality official from the mother company, Sandvik AB, who conducted external audits at FSAB; another external person who passed was the hired person in the QS-9000 project. Hence, besides the QS-9000 project manager, there were now five FSAB employees who were certified QS-9000 internal auditors. A number of other persons had enough knowledge to take part in internal audits and to further develop their awareness of how to develop processes and routines that satisfy demands by suppliers to the automotive industry.

The most important guide means in the QS-9000 planning were a number of Quality System Assessments based on the QSA manual, communication among internal and external colleagues and the QS-9000 reference manuals. In total, 14 persons at FSAB were individually responsible for assessing specific matters in the operations. The QS-9000 manager gave a clarifying description of the intention and approach in the assessment. Different subgroups were involved in identifying the gap between the current operations and a future state satisfying the QS-9000 requirements; actions were then suggested to close the gap. The idea was to summarize and discuss the results of the analyses in December, 1997, but this was delayed. Not until the beginning of 1998, after recurrent reminders to some of the persons responsible, were all the analyses finished and submitted to the QS-9000 project manager.

At the same time, continuous work was going on to understand how the requirements and organization could be approached in a mutually adapted fashion. The foundation for this work was a basic idea that all the requirements should fit into some kind of network of identified processes or areas of work. A recurrent dialogue with various actors in the organization defined a structure of business processes or areas of work suitable for attacking the QS-9000 requirements. The main focus of this ongoing dialogue was to find some sort of infrastructure for developing a quality system that would satisfy the QS-9000 requirements. Hence, it was not a process analysis focused on finding problems in

the organization and improvement potentials; instead the result of this work enabled a division of labour and responsibility within the QS-9000 project.

The development of the QM system put further pressure on some managers to adopt a set of new thoughts and methodologies and to further develop existing routines. Plans were made, and follow-ups conducted, but when it came to action, progress was slow. At the same time, many persons had not yet integrated thoughts and methodologies in which they had previously been trained. For instance, the researcher commented on the fact that the measurements of the key areas in the Success Tree had not been established. He was also bothered by the fact that success stories that had been decided to be of high priority were not communicated; the perceived dilemma of communicating success stories was continually on the agenda as the researcher communicated with the FSAB managers. The slow fulfilment of a number of activities in the improvement plans was another issue. Added to this was that still very few were using the tools in a systematic way. When the tools were used they were often applied at a rather superficial level, or they were used in a rather fragmented way without stimulating successive progress. It seemed as though all kinds of requirements and initiatives undermined successive and sustainable progress.

It was also clear that there was variation in the motivation to develop the QM system; this motivation evolved, however, as an understanding of the intentions grew. In general terms, only a few persons in the company developed a more fundamental understanding; and, basically, no operators were affected in their daily work, except in a later case where they must increase the amount of inspection due to unstable production processes. Those affected were managers, various engineers and those who pushed towards a more TQM-oriented behaviour. The development was multidimensional and slow, but new forums and routines were successively developed.

While the development was slow, viewed from a TQM planning perspective, much developmental work was continuously going on in the organization. Several major technological projects and projects to develop the information system were modernizing the company; a new subsidiary in the US was formed; a new maintenance system was developed together with ABB TS, to which FSAB had outsourced the maintenance during this time period; there was continual leadership training preparing the managers for a new way of managing the company. In the midst of this, FSAB was a party in dumping allegations where the US steel industry accused companies in the Swedish steel industry. Another example of issues needing the attention and energy of certain managers and engineers was the Y2K problem; all the information systems were assessed with regard to risk in the programmes in the shift from 1999 to 2000. Thus, a complex of

matters were discussed and addressed in different ways, and several developmental projects were going on at the same time.

Several managers were involved in a variety of tasks, and many issues besides the ordinary business were on the agenda, as so often is the case for managers. Most of these tasks were not systematically facilitated by what had been learned during the TQM process; efforts were made, but it was a struggle for the great majority of the managers to get practical results from the TQM training. Several managers expressed, however, the fact that the tools were beneficial as awareness grew through recurrent use and reflections. Nevertheless, most of the improvement activities along the way, which were to drive the TQM development, were still not done in a systematic manner. Even though there had been beneficial initiatives within the organization, these were not perceived as progress in the development of QM; the initiatives that were more action driven were often part of the operative development, which was not directly associated with QM.

One example of this was the FMEA initiative mentioned by the Q&D manager in the reflection on the two days of training on 8-9 February, 1996. The operators handling the raw material from suppliers and the suppliers were involved in improving the operations by using FMEA. This pilot FMEA was a mutual initiative of a production manager and the Q&D manager. The work evolved into a natural part of the work, where the operators handled most of the work themselves; operators at FSAB and at the suppliers developed a co-operation whereby they could handle a number of issues without involving managers.

In practice, many of the projects that were explicitly part of the TQM process were perceived and acted upon as separate projects. Even QS-9000 was sometimes viewed as competing with the intentions and work in TQM; it consumed substantial resources on matters concerning assurance and conformance rather than progressive development. On the other hand, this was part of the changes in culture that the FSAB managers needed to handle and act on as part of the progressive development. And it was rather evident that the ability to handle this complex situation was a competitive factor, since many competitors were in a similar situation.

The daily operations were contextualized by changing requirements and outside forces in combination with numerous internal dilemmas. In this context, the consultants facilitating the process improvement project said that it was possible to manage the rather comprehensive change plan developed in this project. A problem was that they lacked any profound knowledge of the ongoing developmental projects. It should have been the responsibility of the managers at FSAB to react, but these managers were in search of managerial solutions for developing the company and they naturally wished to believe in

these promising plans that they had been a part in developing. It was a rather confusing period of multiple strategies and plans for development. During this phase, the president and Q&D manager received a proposition from the consultancy firm facilitating the process improvement project.

The closure of the process improvement project

The perception of the Q&D manager, the QS-9000 project manager, and the researcher was that the consultants in the process improvement project did not realize the complexity and comprehensive nature of QS-9000, and the ERP system in particular. The Q&D manager and some middle managers felt, however, that there was a need for support and drive within the organization, and that the consultant could give such support to overcome existing barriers to change. This was also the QS-9000 project manager's opinion, but he was frustrated when he realized that the consultants had a very different view of the needs than he had. His frustration was further reinforced as he understood that the plan was to continue with the co-operation with the consultants. There was a clear communication problem.

After some discussions on the matter the researcher was contacted to get an outside perspective and third party evaluation of the situation. The president, the Q&D manager and the QS-9000 project manager had a dialogue with the researcher. Various matters were raised and a perspective evolved during the dialogue concerning the continued work in the process improvement project. They discussed the consultants' lack of adaptation with regard to the previous TQM work and the expressed needs. Previously, the president and Q&D manager had explicitly requested support on a more operative level of improvement, and not on management training and design of strategy; the researcher was the support chosen for the top management level. The QS-9000 project manager also described the fact that they did not listen to arguments regarding QS-9000, and his perception that the eight change areas and the plan were unsuitable for the situation. After examination of the offer and reflection on the experiences, they came to an agreement that it was not wise to proceed in the co-operation with the consultancy firm. Prior to the final decision, however, there was a meeting with all managers.

To prepare for the meeting, the overall situation with all the developmental work going on was summarized on a slide, indicating a very complex situation. All the projects and some of the models for development, including the eight-area change plan showed an overwhelming work load in an already pressing situation, and an overall confusing perspective of the tasks ahead. When the managers were asked for opinions about the

plan, there was first a moment of silence and then a rather loud discussion and clear reaction that this was impossible.

In this way, by presenting an overall view of all the planned activities, and thus giving a fact-based perspective, there was agreement that it was necessary to concentrate resources. It was not sensible to go forward with the plans presented by the consultancy firm facilitating the process improvement. Several of the project members had nevertheless a positive perception of the process improvement project. They had, however, in an overall sense created a model for improvement within, or rather around, the TQM model for improvement. This complicated the development; and the effect of the consultants' inability to adapt their work to perceived FSAB needs was that basically none of the work done so far within the process improvement project explicitly affected the forthcoming progress.

Not even the documentation from the process analyses was used explicitly, even though the QS-9000 project manager's intention was to found the project on a process-oriented approach. The resulting documentation was troublesome to use in the development of the QM system. The results of the process analyses in the ERP project were also troublesome to use. The process analyses had been done for one purpose and in one way in the process improvement project, and for another purpose and in another way in the ERP project. Furthermore, process maps, routines within the ISO 9002 system, contained several other process descriptions based on the ISO requirements. Hence, even though the QS-9000 project manager's approach to work was founded on a process view, process analysis was not a main tool in the development; the process view was however an aid in various types of internal communication, both with customers and with auditors.

Analysis and increasing awareness of QS-9000

A qualitative process analysis (founded on verbal information and not on quantitative data, which can also be used in more statistically oriented analyses of a process) was used on selected work flows that needed to be adapted to QS-9000 requirements; it was used, for example, to develop a new process for addressing customer problems, including corrective and preventive actions, and to develop an APQP (Advanced Product Quality Planning) process. These were thus specific processes, but, while the process view was beneficial in many ways, it was, as described, not the guiding tool generally.

The process-oriented work underlying the analysis of different QS-9000 requirements with regard to organizational activities was another type of process work. This analysis was used as a tool for further development. It was not the type of profound process analysis that the process improvement project had conducted, however; it was only a

means to understand and summarize the requirements with regard to the organizational processes. This work took minor resources.

During the progress, several customers sent formal queries regarding the progress of the QM system development. Several customers also sent their specific QSA to assess the quality system; it was part of their evaluation process in choosing suppliers. During the course of the project, one potential customer replied on January 21, 1998, after a rather extensive communication and clarification of the plans and work that was going on at FSAB:

> *"I have reviewed the Supplier Quality System Survey that was submitted to me by your company. Based upon the responses to several questions that I consider critical, I can not recommend that your company be added to our Approved Supplier list at this time…"*

This was naturally further pressure on and clarification of the importance of this work, if FSAB were to supply the automotive suppliers in the future. In February 1998, all QSA assessments with suggested plans had been sent to the QS project manager. Together with other persons he was fully engaged in understanding QS-9000 and how the requirements could be practically interpreted in the FSAB context. The requirements had not been adapted to the operations in a steel processing industry. Some requirements were therefore very difficult to satisfy and creative solutions were needed to formally achieve the goal of becoming a QS-9000 registered company.

As the results of the assigned analyses were handed in to the project manager, none of the analytical methods that had been learned during the TQM programme had been used. Not even the instructions in the clarifying document given to the persons responsible had been followed by all. The gap analyses were of varying quality; some were thorough and others an obvious result of a low level of commitment or lack of understanding.

Henceforth, these analyses were still part of the foundation in the QS-9000 project; different persons in the project group were specifically responsible for action plans directed towards specific requirements. The plans were continually complemented and adapted to perceived needs as knowledge increased concerning the meaning of the requirements. Meetings with external colleagues working in the same direction as FSAB with regard to QM were important in this development. During these meetings, experiences were shared and plans discussed.

To learn further about the FSAB customers' perception of QS-9000, their requirements and how they had developed their QM system, the Q&D manager and QS-9000 project

manager visited the six customers that were the main interested parties in these matters. The visits took place at the beginning of March 1998 and they were partly a response to continual questions on the QS-9000 progress from the customers supplying the automotive industry with products containing FSAB products. The aim was to build trust in the work at FSAB and to gain specific ideas on how to proceed on certain tasks, to come to an agreement on certain issues. Approximately one week before the visits the customers received a proposed agenda, see Table 14, and specific questions, see Table 15, on matters in QS-9000 with which the project team was struggling. The agenda and questions indicated specific matters critical to handle in relation to the customers requiring QS-9000; some issues were very specific and delimited and others were more general.

Proposed Agenda for Customer Visits
1. Presentation of your company and work on QS-9000
2. Presentation of FSAB and our work on QS-9000
– Link to TQM programme
– FSAB's future QS-9000 system
– FSAB's APQP and PPAP
– Design Responsibility
– Discussion, conclusions
– Fastener Quality Act – present status and laboratory accreditation
3. Visit to your operation, preferably showing the link to APQP

Table 14 The proposed agenda sent in advance of six customer visits, two in the UK, one in Switzerland and three in the US

All meetings with the customers took place in a very open and sharing atmosphere in the dialogue, where it was obvious that, in the case of QS-9000, FSAB's customers and FSAB had much to gain from co-operation. It was even a requirement in QS-9000 that customers should facilitate their suppliers in developing their QM system towards compliance with QS-9000. The customers presented their approach in developing their QM system and how they had tackled the requirements that FSAB was struggling with. After this, the QS project manager presented FSAB's approach in developing a QS-9000 based system and how it was connected to a fundamental approach based on the TQM programme that had been going on for some years. The connection between the QS-9000 project and a fundamental TQM process described was a fact much appreciated by the

customers; they indicated that they were very pleased with the serious approach in which the goal was to really affect the culture, and truly change ways of working.

Questions to the customers
General
1. Could we have a copy of your QS-9000 manual, i.e. level 1 in your quality system?
2. What role does FSAB play in your future development?
3. What has been your experience of the approval process?
4. Do you measure the effectiveness of your Quality System? If yes, how?
5. How do you carry out product audits?
APQP
1. How is your APQP organized?
2. May we have a copy to take home?
3. What benefits do you see in the APQP?
4. Can we have a copy from one of your process flow charts, control plans and FMEA:s to take home?
5. Which problems have you met during implementation and in your daily work?
6. Can we have your instructions for MSA?
PPAP
1. What is the most important and the second most important characteristic of our products, see list of specification numbers?
2. Are there any special characteristics?
3. How should we handle the sample parts?
4. For which products do you require PPAP?
5. What benefits can you see in PPAP?
6. On which submission level should we lie?
7. How are you planning to handle the PPAP, i.e. interface with us?

Table 15 Questions sent in advance of six customer visits, two in the UK, one in Switzerland and three in the US

The dialogues with the customers, based on the agenda and the specific questions, rendered a better understanding of QS-9000 and of how FSAB could develop a QM system that would satisfy the customers' demands. The customers' answers to the questions gave specific ideas and guidance on how it was possible to fulfil the requirements. Furthermore, some routines that these customers had developed were directly adapted and used by FSAB, and, in other cases, a better understanding facilitated the work at home in developing new routines and adapting old ones. Another factor

affecting progress was that the visits and quotes from customer representatives increased credibility in various internal discussions, and there were plenty of discussions on requirements, routines and tools to be used in the development of the operations.

QS-9000 implementation

To prepare for the implementation, the QS-9000 project manager had a dialogue with the president about the problem of coordinating all the involved managers' agendas. To address this problem, it was decided that all managers should avoid booking meetings and activities outside the daily operations on Fridays. Friday was defined as the day for meetings and practical work within the QS-9000 project. On 18 March, the president sent a message to all managers at FSAB and all participants of the QS-9000 project group. He explicitly stated that this did not mean that everyone would be involved in such work; it was instead a way to simplify the development of the QM system.

On March 19, 1998, the QS-9000 project manager sent a notice to 21 persons who should attend what was defined as a very important meeting. The QS-9000 project was about to enter a new phase and there would be an adapted division of responsibility, suited for this phase of the project. It was explicitly stated that we would now enter the implementation phase and that this would be a very active period that would require hard work. The meeting would be on April 3, and 16 of the 21 persons were able to attend. The dialogue during this meeting was to be based on a process structure successively developed during the planning of the project.

Seven different "Main Processes" had been identified, comprising different areas of interest within the QS-9000 requirements:

Managing the Operations: comprising the analysis of decision support information and degree of goal fulfilment, providing goals and strategies, and deciding to start CA and CAT projects.

Marketing and Supporting Customers: comprising the investigation of the market, build customer demands of products, developing products and processes, bringing forward new products, and technical market support.

Selling Wire: comprising contract reviews, offering, planning, preparing, supplying raw material, manufacturing wire, inspection and testing, shipping, and invoicing.

Controlling Quality: comprising product planning, planning processes, measurement system analysis, controlling gauges, handling deviations, ensuring corrective and preventive action, realizing the production part approval process (PPAP).

Ensuring Sales: comprising the ensuring of processes, ensuring manufacturing and maintenance, capability studies, buying “accessories”, controlling the inventory, handling of material, analyzing processes.

Providing Competence: comprising the recruitment of personnel, personnel development, training of personnel, and rewarding personnel.

Providing Decision Support Information: comprising the providing of prognoses, budgeting, follow-ups, accounting, and summarizing and presenting non quality costs.

All the requirements and suggested actions from the gap analysis in the quality system assessment were related to these seven areas, or Main Processes, and divided into groups where the top management group had extensive work satisfying the requirements belonging to process 1; the two division heads were responsible for processes 2 and 3 in their respective areas of business; a quality official managing the quality control was responsible for process 4; both the production managers were responsible for number 5 in their respective areas of production; the personnel manager was responsible for number 6; and finally the head of finance was responsible for number 7. The consequences of this division of responsibility were a set of seven focused areas of responsibility facilitating efficient and effective resource management and action.

There was a problem, however; one consequence of the division of responsibilities was that, in practice, persons were responsible for certain tasks within each others’ areas. Hence, this was unnecessary complexity and the content of the responsibilities was changed, moving away from the first intentions and the planned process structure. In this way the areas of responsibility were adapted to practically perceived needs instead of rigidly holding on to a certain process structure. This type of adaptation went on during the whole project in order to manage the resources as efficiently and effectively as possible.

Colleagues from steel companies recurrently met to discuss interpretations of certain requirements and how to approach them. The QS-9000 project at FSAB acts on several requirements that were satisfied by incorporating or developing results of the prior TQM work and other developmental work within the organization; some examples were a new maintenance process, a new problem-solving process and the basic structure for continuous improvement including different methods that had been trained.

In some cases, there was a need to adapt the results of prior work to satisfy specific requirements from certain customers; the problem-solving process was one such example where a customer required a problem-solving process based on Ford's so called 8D

process. On the basis of “Our way of working” and on the 8D process an adapted problem-solving process was developed. In fact, these kinds of specific requirements were much more evident in the co-operation with the customers asking for QS-9000 than in the cooperation with other customers. The questions were on a much more detailed level and on specific matters such as the use of an Advance Process Quality Plan (APQP) for development or on different statistical measures. It was also evident that a common language regarding QM including handling of problems and developmental matters was evolving. When an approach or routine was unclear, a number of professionals had a dialogue and worked out an approach or routine.

The amount of new routines being developed for handling a variety of activities was a problem in this work since it diverted focus. It was an ongoing work to see how all the pieces of the emerging QM structure fit together. At the same time, the ERP project put more and more pressure on managers, on technical personnel and on other office staff. The ERP project was very problematic owing partly to communication problems between the internal project team and the external IT consultants. Several actions were taken, but the root causes of the problems remained. These root causes were related to resources and trust; the internal perception was that the ERP system platform had not been adapted to the needs at FSAB.

The QS-9000 project manager was involved as a co-project manager as one way to act on the problematic situation. The idea was to find a synergistic way to handle both of these comprehensive projects. The QS-9000 project manager also took part in the steering committee of the ERP development at FSAB. The ERP project leader at FSAB and many others expressed the view that the consultants from the supplier had never understood the processes at FSAB. The consultants were not involved in work in which they could develop this understanding. For example, the ERP project leader explained how a comprehensive process mapping was performed that was initiated by the supplier, but no person from the supplier was involved in the process mapping; individuals at FSAB were assigned the tasks of documenting their respective work processes. Furthermore, several individuals from the supplier involved were at different stages, and, as a new person was involved, he or she needed to be trained from the beginning. There was no quick fix to understanding the processes of FSAB; neither was there a quick fix to understanding how the QS-9000 requirements could be satisfied in an efficient and effective manner.

Tools learned in the TQM training and through the QS-9000 requirements were successively used in a more natural way without expending too much energy. At the beginning, they were used in a rather superficial way, but, as the individuals applying the tools got more comfortable, they used them in a more effective manner. The tools were

mostly used in analyses without involving operators, or involving a representative from the operations. Some managers and engineers were applying tools in a more systematic manner. In the view of many operators, TQM did not stand for much, they were not involved. This was also evident in the second theme of the staff development programme during the spring of 1998.

The second theme under the label "The group's and communication's role in FSAB's development toward TQM" was carried out during the spring of 1998. From the beginning, the intention was that the personnel manager and consultant who ran the first theme would also plan the second theme, but the personnel manager had by this time left the company. The Q&D manager and QS project manager thus had much more impact on the programme. Together with the consultant they worked out a second theme and co-operation emerged.

These three persons, together with the president and a recently hired personnel manager, planned the coming staff and management programmes aimed at facilitating the change process. The new personnel manager involved the prior head of the union, who by this time was working in the personnel department. He had worked in the operations in different roles since the 1970s and had previously been involved in developmental work in production. He contributed a perspective that was important for understanding what would affect the operators' perceptions and attitudes.

There was still much criticism of several managerial dilemmas and practical matters during theme 2, but there were also many positive voices. In fact, during the sessions, several persons initially stated that they had first been skeptical but, after the information and discussions, understood better and were more positive. In general, as obstacles to an efficient work group were discussed, several persons felt that there was a lack of understanding of each others' work and situation, problems in the work environment, deficient coordination and short-term solutions, deficient delegation of responsibilities and deficient information to the staff. There were also many comments that, besides the information and meetings at which TQM had been presented, nothing was happening. On the other hand, several persons indicated that much was going on and had changed, although progress was slow.

In total, after each session, the participants gave positive feedback on the four hours of training in which all the staff had taken part during the spring of 1998. Many expressed that they were starting to understand TQM and QS-9000 and that they had a better understanding now, after the session; they also expressed that there was an open and good dialogue and atmosphere. Several persons also commented positively on the fact that the

Q&D manager and QS-9000 project manager were involved in the training. Some persons, however, expressed that they missed other managers, and that it (the messages in the presentations) might sound good, but would never happen in reality, or that it was the same message over and over again but nothing ever happened, “many words but no action”.

At a management seminar at the end of May 1998, different comments from the staff training described above were presented and discussed. A number of very concrete measures that could be taken were raised, in addition to some positive and negative comments from the staff training. These were founded on practical problems experienced in daily work and on the staff’s reflections during the training. In general terms there seemed to be a rather large gap between what was expressed during different training sessions and what was expressed in the daily work. While the comments also indicated that several persons had a rather positive view of TQM, there was still, in practice, as they returned to their day to day work, a very sceptical attitude among many employees. Many employees did not believe that the intentions in the TQM process would have any practical implications, and several expressed the view that the managers seemed to have too many tasks to handle.

At the same time, one day of training in QS-9000 was planned for key persons at FSAB who did not participate in the three-day internal auditor training. A consultant had been contacted, who at that time was facilitating a major development project where nine Swedish tier one suppliers to the automotive industry were to take part in joint work on QS-9000; the companies shared experiences during the development of their respective QM systems. This project was going on in parallel with FSAB’s work, and the QS-9000 project manager was, on different occasions, in contact with some of the facilitating consultants; they worked for a Swedish institute (IVF) with the purpose of facilitating the development of Swedish industries. The QS-9000 project manager was particularly encouraged by some conversations with one consultant regarding the use of statistical tools and measures. This consultant together with a colleague also came to FSAB for a day’s dialogue including some clarifying presentations regarding Statistical Process Control and Failure Mode and Effects Analysis.

Towards QS-9000 registration

A pre-audit during 23-24 June, 1998, pointed out many areas where development was needed in order to comply with the requirements; it was also indicated in communication with the auditor that there was a good understanding of the requirements, and that FSAB was on the right track towards a QM system that could be registered. In fact, the auditors

expressed the view that the personnel at FSAB understood the requirements better than personnel at several other companies. There were certain details in the requirements that were perceived to be critical for FSAB and that needed to be emphasized in further work. On some accounts this was a troublesome situation. FSAB was in trouble as a result of specific requirements on, for instance, stable processes with a certain capability and actions that needed to be taken if the processes were not stable.

These were requirements perceived as being more suitable for other types of industries. In fact there was a rather problematic situation in the development of routines satisfying the requirements for the APQP, the PPAP and the MSA; the problems were on a very specific and detailed level and were not easily handled. On the other hand, the audit report explicitly remarked that "it is positive to note that the planned structure of the new QM system is so good". The auditor also stated that it was possible to reach the goal of gaining certification in November, but that this would be rather demanding.

This challenge was in a key area where several developmental matters were acted upon at the same time. The problematic ERP project and the QS-9000 project had been identified structurally as belonging to the key area called Quality of Work, see Figure 8. There were six prioritized CAT projects under way within that Area. Four of these CAT projects had been defined as driving the Critical Success Factor termed Business Systems. A fifth project acted on the perceived need to process orient FSAB and to implement process management as a tool. Finally, as a sixth project, the development of a measurement for the key area Quality of Work was seen as a priority issue. In fact, the Success Tree, its contents and function were vital parts of the assessment of the QM system; they had been incorporated as major parts of the approach to QM.

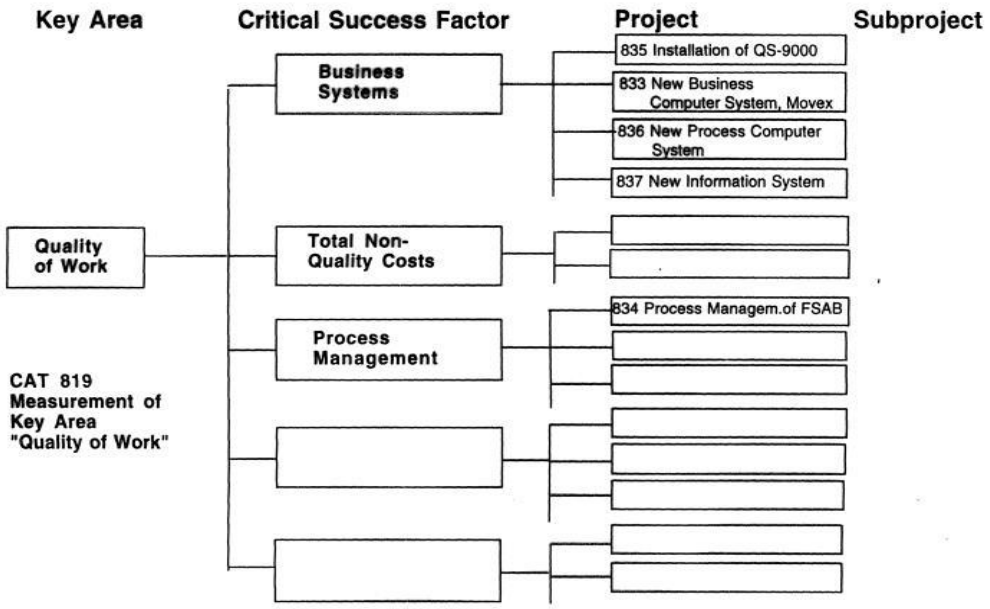

Figure 8 The key area of Quality of Work, its defined success factors and six identified projects to reach success

All these projects were prioritized in the development of the quality of work, and they acted on different aspects: project 819 was to develop a way of measuring the key area Quality of Work; project 833 involved the development and installation of the new ERP system replacing the current costly system developed over the years; project 834 was previously the process improvement project, but was not very focused at the time; project 835 was the QS-9000 project, which also at the time was aiming for process management at FSAB, project 836 consisted of the development of a new process control system within rod production including inspection and testing of products in process; and project 837 aimed at installing a new intranet and the necessary software for an in-house information system.

The development of a way to measure the key area Quality of Work, project 819, was one example of developmental work that was very slow in progress. Since 1995, when the Success Tree was developed, it had been on the agenda; this was also the case with the measurement of Customer Satisfaction and Motivation. Thus, for three of the key areas – Quality of Work, Motivation and Customer Satisfaction – a measurement was not set until the pressure from QS-9000 forced the development; without measurement of the areas, the QM system was incomplete and the auditors would not register FSAB as a “QS-9000 company”.

During the TQM training programme one of the US consultants showed a questionnaire that had been used in several US corporations for measuring employee attitudes which was based on the Malcolm Baldrige National Quality Award structure. He also presented a similar version based on the European Quality Award structure, and the FSAB participants used this version as part of the training exercise. After the development of the FSAB Success Tree, the question of how to measure the main areas remained unresolved for a considerable period of time, but the questionnaire used at the TQM training exercise was mentioned as an alternative.

The researcher brought this questionnaire to the steering committee, which once again filled it in and made an evaluation of FSAB based on their perspective, but primarily with the purpose of testing whether this could be a suitable measurement instrument. Based on a suggestion from the researcher, it was decided to develop an adapted version of this questionnaire in order to include essential issues/statements from the previously developed policies of FSAB (which were in accordance with the intentions in the Europan Quality Award Model).

The Q&D manager and the researcher had developed a pilot questionnaire by October 1997. There were five questions for each of the nine areas: (1) Leadership, (2) Policy and Strategy, (3) People Management, (4) Resources, (5) Processes, (6) Customer Satisfaction, (7) People Satisfaction, (8) Impact on Society, and (9) Business Results. One top manager, two middle managers, two persons from the office staff and six operators from different areas of production answered the pilot questionnaire. After the pilot run, the Q&D manager interviewed all the respondents, and, in a fax to the researcher in December 1997, described how the general perception was that the questionnaire was fine, but a few layout adjustments could facilitate answering it. One person did not know whether he should answer on the grounds of the current situation, or how he felt that it should be.

In August 1998, all the employees received a questionnaire to measure the areas of Quality of Work and Motivation. It contained the same questions that were used during the pilot run in 1997. The response was massive criticism of the form and contents of the questionnaire. Employees at all levels expressed their frustration over it. They did not see the meaning of several questions and they felt that it was too complex and far from the operational issues. As the QS-9000 project manager met different employees in the QS-9000 work, he continually faced negative comments and frustration. He was also very sceptical to the questionnaire, but he tried to take part in creative dialogues concerning the development. The Q&D manager and the QS-9000 project manager had previously discussed the risks of having too many questions, of having a terminology that many

employees might not understand or not engage in, and of having questions which would be troublesome to answer.

The Q&D manager explained that they did a pilot run with rather good results, and that, according to the researcher, one of the consultants involved in the TQM training programme had used it in other companies with success. Nevertheless, many argued that it was not compatible with the organizational context and language at FSAB. There was an ongoing discussion about the questionnaire dilemma. It is difficult to know what the exact explanation of the negative reactions was, but the evaluation of Quality of Work itself added to the scepticism within the company.

In spite of the criticism, there were some dialogues on the feedback from the survey, and the idea was to have the statistics from the survey as a foundation for the third theme in the staff development programme. The feedback process related to the survey was rather inefficient, it took a long time and the results were presented as numbers with descriptive texts and not in a way that was easy to comprehend and communicate. On the other hand, there was a clarifying qualitative description and explanation of how to interpret the results and of aspects that must be considered when using this kind of tool.

With the qualitative description and explanation as a background, it was rather easy to transfer the results into an individual way of presenting the data, a way that was more suitable for communication. This was also done in some tests on theme three in the staff development programme, and with clear diagrams and some focused responses; managers and staff were able to hold a good dialogue on important matters in their workplace. Further, there were dialogues about how to improve the survey. One dialogue clearly affected one of the middle managers, who was previously rather sceptical about TQM. In fact, as the statistics concerning the responses were used as a basis for dialogue, most participants were less sceptical and they could see some benefits from conducting this kind of survey.

The Q&D manager and the QS-9000 project manager were relieved over the fact that the evaluation was one more piece in the QS-9000 puzzle; and, on 21-22 September, a Lloyds auditor conducted an upgrade document audit. The purpose of the audit was to review the documentation against the QS-9000 requirements and to follow up hold points (non-compliances) from prior ISO 9002 audits. A number of problems were found in the documentation, but the old hold points were degraded or closed, which was vital since no old hold points were allowed in an upgrade. This was the input to the final stage of the QS-9000 project and a clear indicator that it was possible to reach the goal of making the

final upgrade audit in November. The conclusion was that this was possible if FSAB worked systematically and efficiently with a focus on specific areas of improvement.

After a review of the documentation from the audit, the Q&D manager, QS-9000 project manager and coordinator of documentation had a dialogue about how to proceed. The structure of the project was adapted to the activities left working on; there were two different kinds of issues: operative issues, such as MSA, FMEA or control plans, and leadership issues, such as the business plan and policies. Hence, the rest of the work was divided between two different management groups: Group 1 acted on the operative tasks, where the two production managers, the logistics manager, the quality control manager and three process engineers took part in this group; Group 2 was the top management group and acted on the leadership tasks. Both groups were to meet two hours every Friday, and the QS-9000 project manager led all the meetings complemented by the documentation coordinator who took notes and wrote minutes.

After a period of substantial work, mainly focused on developing new ways to handle different activities and dilemmas in the organization, two auditors came to FSAB on November 16 and conducted a three-day assessment ending November 18. The QM system assessed contained the Success Tree, the policies and different methodologies developed during the TQM progress as some kind of cornerstones connecting different parts of the system. Furthermore, the QM system satisfied several requirements by referring to the ERP system and the approach to maintenance that was developed. The foundation in the maintenance was a TPM approach developed in cooperation with ABB TS.

During the assessment, there was rather intensive discussion with the auditor, who even called his colleagues to discuss some issues, but FSAB did not pass the audit. It was necessary for them to take certain actions and prove, by working in the system with resulting records as a confirmation, that it was a running system beneficial for its purpose. The lead auditor's comment in the audit report described how the visit (assessment): "shows a mature system compared to the ISO 9002 system and that it was positive that all the old Improvement Notes could be closed, together with most of the prior observations. Nevertheless, the system is very new on QS-9000 issues, which is shown primarily in a number of notes regarding APQP, MSA and capability studies; there are also a number of minor issues. The work has started in a good way but it needs to continue to demonstrate efficient application before a certificate can be recommended. A limited number of Improvement Notes render an elementary follow-up visit" (free translation from the Swedish).

After the assessment the resources were further concentrated on Improvement Notes and observations. The QS-9000 development work mainly addressed five different priority areas besides the ongoing QM work within the developed system. First, the product audits on one of the divisions were developed and realized. Second, the calibration routines and realization of routines were further adapted to the QS-9000 requirements. Third, the routines for preventive maintenance were further developed by integrating several procedures within the TPM approach and the supporting software. Fourth, the routines for APQP were mainly applied in three different projects, and hence it was possible to evaluate the actual flow in the practical work. Finally, the procedures for capability studies were further developed and integrated in the organization.

On some accounts, it was very difficult to address the problems revealed in the assessment. For example, the steel industry had standardized tolerances that were rather narrow in relation to statistical process control procedures and the nature of the steel processing. Furthermore, a coil of wire rod was often used to manufacture tens of thousands of components and, within a coil; there are different types of variations along the rod. This was thus a very different manufacturing process from that intended when the requirements for statistical tools were defined. On the other hand, the dialogues regarding these requirements resulted in work to develop suitable tools for evaluation and continual improvement. The conditions resulted in rather low values for process capability in the manufacture of stainless steel rod. In practice, a Cpk of less than 1.33 (a measure of the process capability) would require a 100% inspection until that level was reached or it would require an agreement with customers to handle the situation in a manner suitable to both. The technical market support and the quality department engaged in a dialogue concerning this dilemma and they reached an agreement about how to handle the situation. In the latter assessment of FSAB there was also a problem in deciding what 100% inspection really meant in the current context at FSAB. The auditors also took into account the fact that FSAB could demonstrate very high results in customer satisfaction measurements.

In general terms, the ongoing work to develop the QM system was getting less complex and more delimited, with increased understanding and agreements on how to approach matters of importance. Over time, key staff and managers became better and better acquainted with the nomenclature and purpose of the requirements and routines. There were nevertheless several requirements that were perceived to force actions and routines that did not add value in the work to satisfy customer needs. On the other hand, this came from an FSAB perspective and customers asking for QS-9000 must satisfy the requirements posed by their automotive customers. It was clear that the requirements

stimulated a dialogue concerning a variety of more or less vital issues in QM and how to satisfy customer needs.

A number of professionals were involved in taking actions to address the non conformances found in the QM assessment in November. After a follow-up audit, April 19-21, 1999, the lead auditor recommended FSAB for QS-9000 certification; later, some principles for the requirements that had stopped FSAB from being given the certificate were changed. This was an ongoing development where QS-9000 experts continually published interpretations of the requirements with regard to questions raised over the years. During the course of the QS-9000 project at FSAB, hundreds of issues had been handled at FSAB.

On an overall level, FSAB now had a new way of developing goals and action plans, deploying resources and evaluating external information. The foundation for this work was a business plan that the top managers recurrently revised on the basis of the information gathered via a variety of tools and approaches developed during the QM development. This strategic work related to a new way of conducting internal assessments of FSAB’s operations, a new way of conducting internal audits and the top management review of the QM system. The information from internal audits was also viewed in a perspective given by a new routine for assessing customer satisfaction, including a customer survey. The top managers followed up the results of the survey and prioritized actions based on the assessment of customer satisfaction in relation to other sources of information, from e.g. the internal audits, market analyses or facts revealed during various improvement projects. Another vital area of change was related to the newly developed routines for advanced product quality planning, previously described. Some major changes were a more systematic involvement of managers in different stages of the product and process development. The work was largely based on a multidisciplinary approach involving persons with different competences. Furthermore, there were several new methods for measuring and controlling the processes. There was also more systematic information to certain customers on the development of products and processes. Still another area of change was that FSAB was working towards a more systematic way to engage suppliers in the development and to pushing their development towards a QS-9000 way of working. Finally, there was more systematized preventive work in production, mainly founded on the new maintenance work developed in co-operation with the supplier of this service.

FSAB met several requirements on process control and preventive maintenance by referring to the functions in FSAB's new software for maintenance and its related work process. In the same way, the new IT system, with the ERP system as one major part,

solved certain issues. Another major contributing factor was the systematized approach to development emerging during the TQM process; this was at the centre of the continual improvement procedures, which was a key element in the QS-9000 requirements. Hence, while it had been slow and troublesome work to integrate the tools and approaches developed during FSAB's TQM training, many of the thoughts were formally integrated in the new QM system.

The final TQM phase and initial stage of ISO 9000:2000

After the QS-9000 certification, the integration of new routines and continuous work to improve prioritized areas continued, with varying degrees of intensity in different areas. There was an ongoing exchange of both internal and external experiences and ideas about how to manage the operations in line with the intentions of FSAB's TQM programme. FSAB was now involved in close co-operation, especially with one customer, addressing mutually interesting topics as part of satisfying the QS-9000 requirement on benchmarking. The requirements were the driving force in this co-operation and gave new ideas in a variety of topics, e.g. on how to solve some specific technical problems, how to design the advanced product quality planning and how to measure customer satisfaction.

Parallel to the exchange of ideas, numerous dilemmas were discussed. One of these dilemmas was how to make the QM progress more operative and concrete in terms of results. Another dilemma was the design of the organization and whether it supported a process-oriented way of working and TQM. In August 1999, a reorganization of FSAB was carried out whereby a new department for business development was formed, consisting of three persons from the former department of quality and development. The experiences from the previous five years indicated a need for a small, flexible support unit responsible for administration of the QM system, for developing the overall business system and for giving any practical support necessary to the organization in the day to day application of improvement tools and methods. In fact, there were also some limited discussions concerning the possibilities of combining some of the personnel department's, the IT department's and the quality and development department's tasks into one unit facilitating the operations.

There was an ongoing debate on how to make TQM work more efficiently and effectively and how to focus on work that truly added value. There was a large flora of developmental problems to be solved; some of these were related to internally identified needs and others were externally driven, e.g. requirements via QS-9000. What was perceived as externally driven and internally driven became successively unclear, however, as many of the QS-9000 driven routines were soon parts of the internal system identifying needs. At the same time, this evolution stimulated an ongoing dialogue about how to handle various formal issues. This was a bit problematic, as the company was again entering a financially unstable period and needed to concentrate on core problems that could free resources.

The work to develop the QM system stimulated a development of new procedures and new ways of handling a variety of situations. However, it also, in practice, diverted the focus among managers concerning acting on current needs. On the other hand, if FSAB had not focused on the QM system, it would have been in a situation where more and more questions from customers would be difficult to address. Furthermore, the maturity to act on needs in an efficient and effective way had taken time to develop, and one of the purposes of the TQM work had been to develop this maturity. So, while the QM development contributed to diverting the focus, the competence to act on needs was developed within this development. It is also evident from seminars, from dialogues, from various ongoing projects and how they were conducted that the knowledge was more and more integrated and was slowly becoming a rather natural way of acting among some leaders and members of the staff. Nevertheless, it was hard to see results in the form of concrete improvements that affected the bottom line in the income statement, and, in this financially tough situation, the Board of Directors was already planning for a new FSAB president.

At the end of 1999, the company was bleeding on a very poor market, and there were several internal difficulties caused by problematic projects such as the new ERP system and new modern process equipment being installed. This modern process equipment was to make steel processing more efficient and effective, but it was at the time a source of ongoing problems. In a long-term perspective, the investments opened up new opportunities, but, in the current situation, given the conditions at hand, they were very problematic. In this situation a new president was appointed.

The new president introduced himself in the December 1999 edition of the company magazine. At the end of this introduction, the president stated ”As you will understand, it is too early for me to give any kind of programme declaration, so I ask to be able to return to this matter on a later occasion. What can be established already is that the financial situation is very problematic and that it will take improvements in a majority of areas in order to reach an acceptable level of profitability. I know that this has been a very tough year for you with the investments, computer system change, organizational changes, and staff reductions. I hereby wish to thank all of you for your contribution during the past year, and also to wish you a Merry Christmas and a Happy New Year”.

At the beginning of 2000 there were internal speculations and political activities, where persons acted to affect the new president’s perspective on the needs in the operations. The president took time to get acquainted with various parts of the organization and to gain an awareness of organizational problems. After some time, during the early spring, he presented a new organization and a new agenda to the employees. The rather new

business development department that was formed in the last organizational change, and was part of a broader QM strategy, was not part of the new organization; and the former Q&D manager was offered a retirement plan, which he accepted. The new quality manager's role was to be restricted more to specific quality-oriented matters and less directed towards QM as a comprehensive tool for company and business development.

The focus on TQM was abandoned as the new president did not see any concrete financial effects of this work. In the light of the financial situation it was therefore troublesome to defend TQM. The focus now was on adapting the organization to the financial situation, and the new president clarified his view of the TQM work in a conversation with the QS-9000 project manager in the spring of 2000. He explained that, in a situation where the company was bleeding, he could not invest resources in work that did not directly cut costs; it was not possible to go to the Board and say that investments would be made in a programme where the benefits were hard to prove.

The president's main task was to stop the bleeding at FSAB and to solve a number of critical problems in order to make it a profitable company. One problem was the product mix and another issue was the price of raw material. The QM work was redirected towards production and towards maintaining certificates. There were some disappointments among the TQM development; however, there was also recognition of the need for the new president's measures. In terms of the price of raw material the former president had also been working towards a solution to the troublesome situation where material suppliers were also owners of FSAB. Hence, much lobbying had already been achieved as the new president took on this task that could have a major impact on FSAB's result.

A new quality manager, very familiar with the QM system and the FSAB's operations was appointed internally; and, parallel to the QM changes, the final stage of the ERP project was coming closer, although much development remained before it could efficiently support the operations. The QM system was successively developed and refined via the audit system. Many of the principles and forms of TQM had previously been integrated in the QM system, and were thereby still part of the operations, even though the focus on TQM as such had been abandoned. Some persons, however, expressed the view that the approach after the reduced focus on TQM was actually closer to the intentions than before; others found the development to be a closure of a development where some benefits of TQM were emerging.

During this period of focus on internal measures to reduce costs and achieve a financially stable situation, auditors gave information about the coming ISO 9000:2000 and ISO/TS

16949. In the total context, however, this was a marginal matter, even though several managers showed interest in knowing more about the new system of requirements. There was not at all the same scepticism as during prior introductions of QM system requirements; there was confidence. A third party auditor explained in a dialogue that, if you have QS-9000, you already have 95 % of the requirements that 9000:2000 covered.

In the case of the ERP project, it was still progressing, but all the persons involved were striving for closure of the project. However, it was evident that it had been a costly project with many modifications of the standardized ERP system for the steel industry. This fact might lead to substantial extra costs in the future, but, over time, the mistrust had been reduced within the ERP project. Both the supplier and personnel at FSAB could see a number of project-oriented issues that could have been handled in a different way. The minutes from a March 2000 “users (of ERP system) meeting” showed a reflection of the supplier indicating some conclusions made from the development work. They stated that, in the future, they would work in a manner based on considerably closer co-operation between customers and programme developers.

Concluding Remarks

Table 16 below presents an overview of the various QM initiatives, standards and other management ideas, forced and stimulated over the years by different customer requirements and institutional forces; these are contextualized by other parts of the progress, and in relation to FSAB changes of president and major structural changes during financially unstable periods. The contents of the table are organized in chronological order according to the starting point, and three major financially unstable phases, comprising restructures, are indicated by the "explosion" symbols.

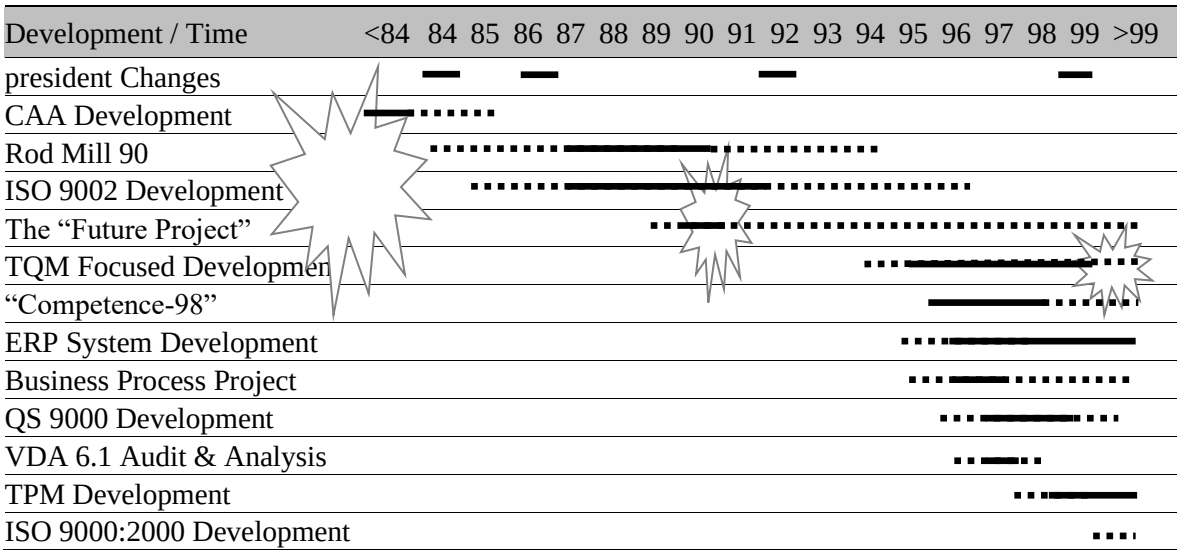

Table 16 An overview of the development pattern inspired by different models and sorted in ascending order of starting date.

The first row indicates the changes of president from the time of the formation of FSAB. We estimate that this change process took approximately one year. It may have taken more or less time; nevertheless these changes were part of the progress within the organization. The dotted lines indicate pre or post stages of the actual work on a certain project or development. The variety in requirements or ideas that over the years have been complementary or competed in the evolution of the company presents a view on either of the initiatives and its related progress.

In the context of structural changes during the 1970s and 1980s, various quality system requirements started to influence FSAB. The explicit QM progress was characterized by various requirements and ideas for development, which were internationally formalized and diffused to various organizations. From the middle of the 1980s and onward the ISO 9000 requirements affected the development, starting with drafts for ISO 9002:1987. In

the middle of the 1990s, the TQM strategy incorporated several concepts for development based primarily on experiences from Motorola, Xerox, Pitney Bowes and ABB. In conjunction with the TQM progress, procedures complying with QS 9000 were successively incorporated with the goal to obtain QS 9000 registration and to improve the existing QM system. The QS 9000 requirements were diffused by the American automotive industry, and FSAB also faced requirements from the German automotive industry, VDA 6.1. Finally, ISO 9000:2000 started to influence FSAB during the year 2000.

Table 16 indicates a complexity that is illuminated when QM is longitudinally viewed in the perspective of other ongoing work. As has been described, the QM path over time was affected by both inter- and intraorganizational factors. It is also clear that there has been a constant problem of integrating QM and making it a natural part of company development. A question emerges in the case description. What, during the QM work process, influenced the results of the efforts to naturalize QM into an efficient and effective developmental instrument? What were the results? And how could better results have been achieved?

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Appendix 1 Data from annual reports between 1984 and 2003

Table 17 shows selected data from the annual reports. It should be noted, however, that the figures give an overview intended to present a contextualizing view of the QM development. Over the years, there have been several structural changes in the company and changes in how the data were presented in the reports. From a financial perspective, other figures are relevant. The figures below serve their purpose here, however.

Year	Revenue	Total costs	Income before allocations	Investments	No. employees	Wages & remuneration
	Mkr	Mkr	Mkr	Mkr	average over year	Mkr
1984	985	898	33,1	24	1114	59,5
1985	831,7	760,8	27,4	17	1029	109,7
1986	670,7	598,9	48,2	11,9	923	103,7
1987	593,5	537,4	50,5	25,3	772*	103,1
1988	714,9	657,8	40,8	38,8	739*	107,6
1989	839,9	816,7	-8,6	70	702*	112,7
1990	628,4	623,2	55,5	49,5	604*	104,6
1991	524,2	546,3	-63,1	18,9	518*	100,9
1992	590,6	587,1	-15,7	4,6	403*	87,3
1993	809,4	719,9	64,6	7,4	359*	78,7
1994	1090,6	963,1	109,3	20,4	398*	91,3
1995	1668,6	1469,4	172,4	41,6	476*	116,1
1996	1174	1118,2	30,8	19,6	381**	94,3
1997	1417,4	1420,8	13,1	22	375**	97,8
1998***	1309,5	1332,3	-27,2	57,7	388**	104
1999	1152,7	1235,4	-83,5	35,8	358**	101,7
2000	1585,6	1608,8	5,9	23,1	334**	98,4
2001	1196,8	1190,5	-2,2	15,8	312**	95,5
2002	1284,1	1219,3	56,7	11	303**	93,1
2003	1155,9	1154	-4,7	13,9	303**	95,4

Table 17 Data from annual reports between 1984 and 2003

*Excluding long-term absence; in 1994, 94 persons were excluded

**Excluding long-term absence and Fagersta TeknikService (FTS) employees; in 1995, FTS had 99 employees

***51% of FTS sold to ABB, a company not consolidated in the figures

Paper 2

Quality Management from a Company Development Perspective

The complexity of a change process

Stefan Book, Sverker Alänge & Barry Solly

In writing this paper, we reanalyzed Book et al. (2004). Alänge and I were referring to paper 1, but we also had numerous dialogues on our experiences in reference to the collected data. In this work, I also continually talked with Barry Solly, the former quality and development manager at FSAB.

The paper contains a synthesis of paper 1. Then we examine the development of QM through a model which we developed in the paper. This model gives a notion of how practices and ideas developed in companies, by consultants and by researchers, spread and influence companies like FSAB.

In the examination, we identified a number of critical issues as central in the development. We discuss these issues tentatively and propose that "instead of striving for strong symbols of QM and going into a strategy of promoting QM and its importance in "visual" symbols, the aim should be a type of "invisible success" – a success embedded in all types of processes in which the stakeholders of the company take part. This was the first formulation addressing the problem of naturalizing QM. The continuing drive in the research was a notion that to succeed in the work for the "invisible success", people need to understand the problem of naturalizing QM. To develop this understanding was the objective in writing papers 3 and 4.

Abstract

The purpose of this paper is to examine the development of QM at Fagersta Stainless AB (FSAB) in the perspective of ongoing company development processes. The experiences from FSAB exemplifies the complex change processes over time, which are associated with the development of QM. One central proposal, is that for QM to be successful, the aim should be to drive for an "invisible success", a success in which QM becomes embedded in the natural ways of working.

Keywords: organizing, models, quality management, processes, development, exploration, exploitation.

Introduction

Various studies done in the past decade have treated Quality Management (QM) based change efforts in industry and the results of such changes. Some authors, such as Hendriks and Singhal (2001), Easton and Jarrel (1998) and Hanson (2003), indicate that QM as modeled in quality awards promoting TQM is likely to render positive developments in a company, while others, e.g. Beer et al. (1990) and Argyris and Schön (1996), indicate that the programmatic changes that often prevail in TQM initiatives probably result in no change at all. Some authors make conclusions based on the assumption that winning a quality award is a firm indicator of a thorough TQM implementation and that it would hence be possible to discern the effects of TQM by comparing the economic results of these winners with a control group of non-winners. Others however doubt that there is in fact any cause-effect relationship between a QM approach and the economic results, since so many factors influence the bottom-line results.

Various factors, external to a specific QM process or a specific QM-based change project, influence progress. Kimberly (1981) points at several factors, e.g. the effects of other previous or ongoing development work. Alänge et al. (1998) emphasize the importance of defining what is really meant by the phenomenon studied, as various authors writing on the subject do not use similar definitions. QM can be seen both as a managerial innovation and as a systems approach including a comprehensive quantitative and qualitative tool box; it can also be seen as a philosophy characterized by its principles, practices and techniques (Dean and Bowen, 1994). Furthermore, research on the diffusion of innovations (Rogers, 1995, Wolfe, 1994) identifies several characteristics of a new idea, practice or object that affect its diffusion and effects on an organization. Hence, studying and understanding a QM change process can be a complex task in which a multitude of dimensions must be considered.

Practitioners and researchers both have a tendency to view QM as a linear change project, starting from zero and leading to a sustained, changed condition. The view has sometimes been reinforced by consultants interpreting Lewin's (1948) model of change: Unfreezing-Moving-Freezing in a single project sense. Such linear thinking might lead to a simplified view of the complex change processes that occur in organizations. To comprehend the change associated with QM, the initiatives taken should not be looked upon as a singular free-standing project but as one that has a history and an ever-changing context in which constant adaptations are needed. These intricate processes of organizing change are recognized by several authors from different fields that point to the need of a more longitudinal perspective in change processes.

Weick and Quinn (1999), reviewing several studies of change, point at some of the problems in a simplified view of change and propose a shift in vocabulary in studies of change. They suggest that a focus on "changing" instead of "change" can stimulate a greater appreciation of the fact that "change is never off, that its chains of causality are longer and less determinate than we anticipated, and whether one's viewpoint is global or local makes a difference in the rate of change that will be observed…" (p. 382). Van de Ven and Rogers (1988) indicate a number of aspects to consider in the study of innovation and change and show the importance of a longitudinal perspective, studying innovations over time in relation to each other instead of only studying single innovations. Furthermore, focusing on improvement programs, Keating et al. (1999) point at the phenomenon that interconnections between different programs "can create synergies across programs as well as damaging competition" (p.129). Considering the above, in order to describe and analyze dynamic processes of change, there is a need to include a broader perspective both in time and in terms of the array of potentially influential factors.

This paper examines the development of QM in the perspective of ongoing company development processes. It is based on an explorative study of the QM development in Fagersta Stainless AB (FSAB), with a focus on the period from the formation of FSAB in 1984 until 2000. The study was conducted by Book[9] in cooperation with Solly[10] and Alänge[11] during the period 1994 to 2001; then, after recurrent examinations, Book and Solly (2004) described the development between 1984 and 2000. In this paper we give an overview of the development with a focus on quality management and in the context of

[9] Stefan Book managed the development at FSAB leading to a QS-9000 registeration from 1997 until 2000 while incorporating a TQM approach and facilitating its further development. He has been involved in and studied process-oriented development in different organizations since 1995 and is currently a Ph.D. candidate exploring process-oriented development.

[10] Barry Solly, Ph.D., was Quality and Development Manager at Fagersta Stainless AB (FSAB) where our study was conducted during the period 1984 – 2000, after three periods in other roles in Fagersta AB operations: 1974-1976, working in research and development; 1976-1980, working in a technical market support and process development role; and 1980-1984, manager of technical market support and process development. Solly was Stefan Book's manager at FSAB from May 1997 until the beginning of 2000. He is currently an OD consultant.

[11] Sverker Alänge, Ph.D., Associate Professor at Chalmers University of Technology, was an advisor and mentor in FSAB's TQM initiative between 1994 and 1999.

other complex change processes. The case exemplifies a change process taking place in the context of restructuring, investment and disinvestment, parallel internal change projects, and replacement of leaders. These changes take place through decisions and activities influenced by business cycles and different management models used in the company.

The paper starts with a description of the methodology and continues with a presentation of the theoretical framework used in the analysis of the development of QM. The next section is based on Book and Solly (2004). It provides an empirical picture of the development of QM at FSAB. In the subsequent analysis section, the QM development is discussed along three main dimensions in the theoretical framework: the QM practice and phenomenon, management models and organizing processes at the company level.

Methodology

The empirical section in this paper is, as described above, based on Book and Solly (2004), which treats an explorative study of the QM development at FSAB. This study takes a stance in an overview of several hundred years of evolution of the Fagersta AB operations, prior to the formation of FSAB, leading to a 30- year period from 1970 until 2000 when QM was successively changed in parallel with a successive restructuring of the operations. During this period FSAB was constituted in 1984 as a final step in the successive restructure of Fagersta AB.

The data collection was conducted through a combination of participative observations, retrospective interviews, document analysis and an action research approach. This active involvement in FSAB's development enhanced the understanding of the company, its development and the development of quality management; the involvement also rendered a risk of bias and a risk of losing perspective, however. This risk was reduced by a triangulation of data from the different sources presenting complementary information.

The guiding sources of data were, in order to minimize bias, different types of documents: strategy documents, offerings from consultants, planning documents, minutes from meetings, and notes from meetings. These data were complemented by direct observations and reflections made and documented by the researchers during the development process in the company. The data above were used in conjunction with data from 23 retrospective interviews conducted half a year after Book and one year after Solly had left the company. The interviews covered all the areas of the company and different aspects of the developmental work and were based on the narratives of top and middle managers, operators, union officials and consultants.

All the interviews, except one with an external consultant where only notes were taken, were taped and notes were taken during the interviews to facilitate the subsequent processing; all the interviews started in open questions, where the interviewees were asked about their roles and when they had started at the company. It was explicitly expressed that the interesting matter was the interviewees' experiences and perceptions of the development in the company, in order to better understand the development at FSAB. An explorative interview followed, where open questions were combined with closed questions to confirm statements that were unclear. The immediate impressions and notes from the interviews were clarified in direct connection to the interview occasion.

While there is naturally a certain bias in the study, this does not intrude on the purpose since the aim is not to present "objective" data but rather to capture certain phenomena and discuss their implications for research and practice. However, a continuous awareness of and caution concerning possible bias in all steps of the study increase its reliability and validity. This has been emphasized during the entire course of the explorative study as the intention is to use it in latter explanatory studies in line with Yin (1994, pp. 3-5).

Practices, Models and Organizing

From the perspective of the individual firm, inspiration for new ways of organizing QM typically comes from the outside. QM can be seen as a "practice in action" in one (or several) organizations that is presented to members of another organization via different models, see Figure 9. Such a model is a simplified description of a complex practice in action, where someone (a researcher, a consultant etc.) has tried to lift up the specific characteristic of the practice in order to facilitate communication with members of other organizations. Hence, a certain practice can be transferred into an idea, concepts, methodology, object or stories, which can be viewed as an (organizational) innovation being diffused. In this sense diffusion of innovation theories, exemplified in the introduction by Rogers (1995), Wolfe (1994) and Van de Ven and Rogers (1988), can contribute to the understanding of change processes affected by different models. This is also indicated by Alänge et al. (1998) and Alänge and Jarnehammar (1999).

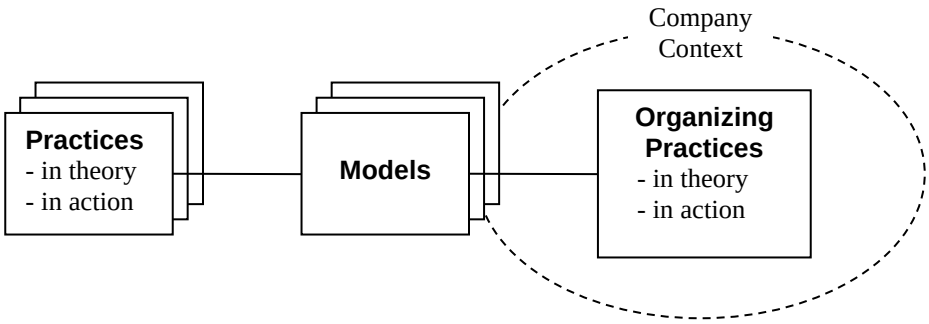

Figure 9 A model of organizing for quality management

Our study focuses on QM models as part of a development process contextualized by other models and development processes. In this context, the employees must develop an understanding of the essence of these QM models in order to be able to evaluate whether the models can be useful for their organization; they "translate" the characteristics of the model (which is a simplification of reality and influenced by external consultants' understanding) on the basis of their own pre-knowledge, and they try to relate their perception of the model to ongoing processes and practices in their own organization, i.e. through a sense-making process (Weick, 1995). When some members of the organization decide to introduce a new management model, this can take place in different ways; the model can be adopted to the "full" extent or parts can be deliberately chosen for adoption.

There is typically a considerable degree of modification in fitting a new organizational context; and the model sometimes reaches different members of the organization at different points in time; this is referred to as re-innovation in the study of diffusion of innovations (Rogers, 1995). A model may thus be modified along the way and different members can hence meet different versions of the model (Alänge & Jarnehammar 1999). This process of implementation can be seen as consisting of two interrelated steps: one step consisting of organizing for new practices in theory, i.e. planning, training, and producing mental pictures of desired futures, and another step of organizing in action, of making changes in practice and directly influencing the behavior of selves and other organization members. This second step is sometimes taken simultaneously with the first step, but often is not, which risks resulting in no change.

The characteristics of a specific practice determine both the potential of encompassing its characteristic in a management model and the possibilities of organizing for new practices in a new organization. Hence, it is essential to identify what the phenomenon

consists of, both with the practical purpose of using the practice and for the purpose of examining, analyzing and evaluating the implementation process (Alänge et al. 1999). Quality management is a complex phenomenon, practiced in many different variants in different organizations; there are a large number of management models describing the phenomenon in partly over-lapping manners. In the case of QM there are also standardizing bodies who have actively attempted to formulate versions of QM, e.g. ISO 9000, QS-9000, Malcolm Baldrige National Quality Award Values, as well as consultancy organizations and researchers who provide their versions of the phenomenon (Lundgren & Alänge, 2000).

In the description above we have focused on models reaching an organization from the outside but models of practices exist inside the organization as well. On some level, all individuals in an organization have their own models of company practices, more or less elaborated and more or less explicit. An individual's model is influenced by position and perspective, as well as by previous experiences and education. The management's models, i.e. how they interpret reality and practices, may have considerable importance for a company's development. Engineering staff and other technical personnel often have their models, and shop floor workers and labor union representatives have their models of company practices. These models influence the way new models are perceived and reacted to. In this way new models arriving from the outside blend into something that can sometimes be seen as a true melting pot, while at other times they have the character of separate substances refusing to mix. In melting pot like that, March's (1991) arguments about the importance of a balance between exploration and exploitation are relevant. In this perspective, for a sustainable and balanced development to take place, a balance between exploiting internal models and exploring external models is essential.

Overview of the Company and QM Development

The roots of FSAB go far back, to the 12th century, and the Fagersta Steel industry was part of a development that accelerated between the 16th and 18th centuries. Fagersta Bruks AB (renamed in the beginning of 1970 to Fagersta AB) became a limited-liability company in 1883 after several hundred years of operations in the Fagersta area. Hence, their operations have a long tradition and history and as far as into the 1980s the concept of quality was mainly product-related, referring to different product characteristics. Quality management was not a common concept but instead an integrated part of other work where inspections and assurance measures were taken as part of production or product development. Several ups and downs have influenced the capital-intensive Fagersta operations, which have gone through a number of crises over the years. During this time a very good 'quality reputation' on an international level evolved.

In the 1970s there was a gradual increase of formal quality system requirements. This development was enhanced by formal requirements from the Civil Aviation Authority (CAA) in the UK, and Fagersta AB received a certificate of approval in the middle of the 1970s; the requirements were still focused on product quality. At the same time the steel industry in Sweden, and in Fagersta, was struggling to cope with a crisis introduced by the financial downturn during the 1970s. That crisis led to a restructuring of the Swedish steel industry, including Fagersta AB. Fagersta AB was successively reconstructed into four specialized and highly competitive companies on the world market: Seco Tools AB, Kloster Speed Steel AB, Secoroc AB and FSAB. This constituted in 1984 the final step of the restructuring, which continued in FSAB until the end of the 1980s.

In this context of structural changes the ISO 9000 requirements began to influence FSAB during the middle of the 1980s; over the years FSAB was affected by several other models besides ISO 9000. The explicit QM development was characterized by seven different models, formalized and diffused in different ways: the CAA requirements based on some kind model for quality assurance; ISO 9002, comprising a system of requirements based on another kind of model; a TQM model incorporating several sub-models, including a business process improvement and management model that consultants use as part of the facilitation of TQM; QS-9000, comprising ISO 9000 requirements but further developed by the US automotive industry, and VDA 6.1, which is a corresponding system of requirements from the German automotive industry; and finally ISO 9000: 2000, which began to influence FSAB at the end of our data collection period during 2000. The development inspired by these models was contextualized by many other processes and models over the years; examples that appear in the FSAB study are presented in Table 18, in relation to FSAB's changes in presidents and major structural changes during financially unstable periods. The information in Table 18 is organized in ascending order according to when the models started to be used, and three major financially unstable phases, comprising restructures, are indicated by the "explosion" symbols.

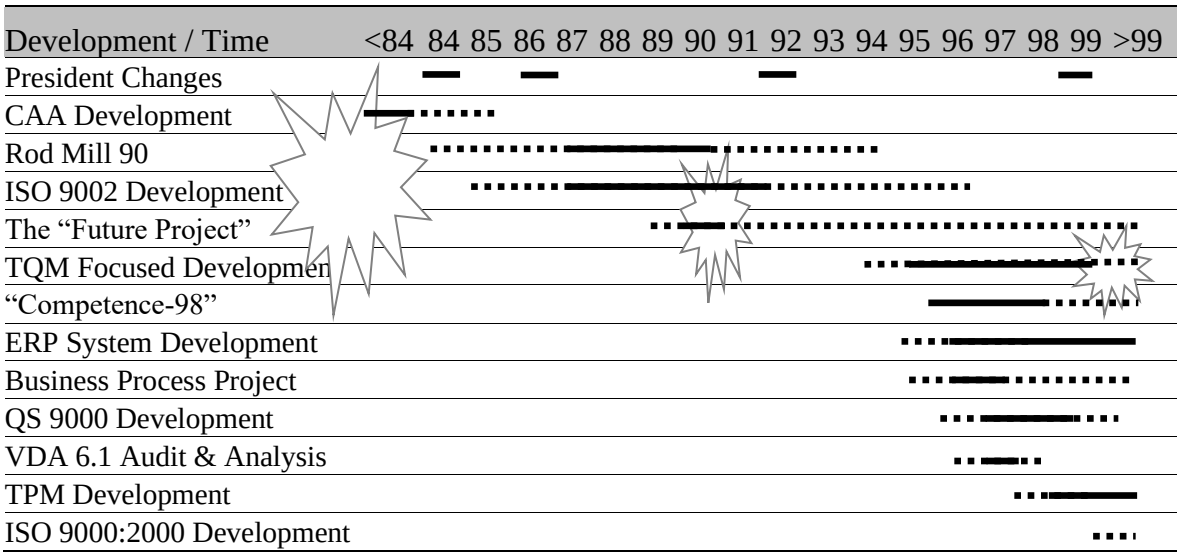

Table 18 An overview of developments inspired by different models and sorted in ascending order depending on when they started.

The first row shows the changes of presidents from the formation of FSAB. We estimate that this change process takes approximately a year. It may take less or more time depending on the circumstances. The matter of interest here is the fact that these changes contextualize other developmental processes within the organization. The dotted lines indicate pre or post stages at FSAB of the actual work related to a certain model. The complex of models that have been complementary or competed in the evolution of the company over the years gives a perspective on either of the developmental sub processes.

In the first stage after FSAB was constituted in 1984 the first president had to manage reductions in operations as a consequence of the chosen strategy; the second president, coming to the company in 1996, continued the restructuring and also managed a development program, "Rod Mill 90", aimed at improving three aspects – the finishing speed, the coil weight and the rod size – by a factor of three of FSAB's rod operations. The board of directors' granting of funds for this development was viewed by the president as a major decision changing a previous development directed mainly at reducing operations. The first two goals were reached but the third was abandoned. During this period a QM System (QMS) was developed with the objective of gaining ISO 9002 certification. The QMS was rather defensive, however, and was basically a system of documentation meant to assure quality; indeed, at this time, QM was mainly a matter of quality assurance. Even though all presidents managing FSAB during the ISO 9002 development formally supported the development, the QMS was not in focus due to other

priorities; furthermore, the QMS was met by skepticism and mistrust, where formalities and documentation were perceived as being more important than actual developments.

Not only the QMS met with this attitude; the developments triggered mistrust and skepticism towards top management in general and toward different initiatives based on models of reality and development. One initiative that created mistrust and skepticism was called the "Future Project" and was initiated by the president in 1990 after the major restructuring was over. It focused on four fundamental principles – Basic Values, Long-Term Direction, Goal and Mission Statement – and was a very serious effort to initiate a positive development. The work was abandoned, however, in a financially problematic situation within a year from its start, leading to a decision to reduce staff by approximately 40 percent. The president at that time initiated downsizing, but a change of presidency was approaching.

The third president since the formation of FSAB started in 1992 and the company received its ISO 9002 certification in February 1992. QM was successively mainly associated with the QMS and its development, but this development was not very action-driven; it was mainly a matter of planning, coordinating and documenting, based on a system of internal and external audits. QM was still in the margin of development during a period, 1992-1994, of economic growth and benefits from investments during prior restructuring; the market was growing and continuous measures were taken to adapt operations. There was a belief that the ISO 9002 system was not sufficient and a TQM process was started when the top managers took part in a 17-day training program in 1994; a plan for internal training and development of a TQM culture was defined.

A QM focus emerged via internal training comprising numerous models for development, tools and techniques, but there was a continuous focus on planning and mobilizing via training and coordination, and not a focus on action - even though action is sought for and intended to be part of the concept. A tailored concept for development based on an internally developed "Success Tree", in conjunction with a defined approach called "FSAB's way of working" based on a learning cycle, characterized the work. Throughout the process a TQM mentor together with other consultants facilitated the development and a kind of "infrastructure for development" was defined, including coordination by a Steering Committee. The TQM initiative was met with skepticism, however, when it was launched on a broader scale in December 1995. The top management never comprehended the scope of this skepticism; they did not see the mistrust that was partly catalyzed by the experience from the Future Project in 1990. In this context some of the action-driven managers successively left the company. There were also different interpretations of the meaning of TQM. A new personnel manager coming from a

company where TQM had another role than at FSAB took action, indicating a lack of understanding in the FSAB approach; a program for competence development "Competence 98" was not developed by using the principles and tools underlying FSAB's TQM concept. Furthermore a new division head and a new head of finance, both employed after the initial stages of the TQM process, never became truly involved in this process.

In parallel with FSAB's QM development, Chrysler, GM and Ford harmonized their requirements on suppliers through an action group that started in 1988; this work led to the development of the QS-9000 quality system requirements that via different processes gave rise to the start of a QS-9000 project at FSAB in May 1997. This project started in conjunction with the TQM process and was intended to boost the inactive development; it also started in conjunction with the development of a new IT system, characterized by a new Enterprise Resource Planning (ERP) system purchased and developed in cooperation with a consultancy firm. These two projects were explicitly stated to be of the highest priority; however, they competed for resources and a complex situation arose as the ERP project became very problematic and numerous other development plans existed.

Much of the intended development was summarized or generated in a business process (BP) project facilitated by another consultancy firm taking part in the TQM training. This consultancy firm was to have one role within the total concept, but it was instead clear that they took much broader and more strategic considerations than what was intended; they formed another comprehensive framework on the same level as the TQM work instead of playing a role within the TQM process. Their approach was based on a standardized model and strategy developed in the US in a cooperation between a consultancy firm and a major US company. The BP project was stopped before any action was taken in practice due to adaptation problems, after spending substantial resources. Before it was stopped, however, a number of persons gained experience from process mapping and analysis. The process analyses were conducted in conjunction with the mapping of processes for the ERP project but those two development projects were not coordinated by an adaption of their respective process view into a common view facilitating a synergistic development. It was clear that there were different interpretations and emphases with regard to processes in these two projects. A common characteristic, however, was the inability of the consultants to understand FSAB's needs and to adapt their approach to these needs.

As QS-9000 customer demands successively increased, so did also VDA 6.1 demands, and an audit was initiated by the German steel industry; these demands affected the planning of QS-9000 during 1997 and the beginning of 1998. And, in conjunction with

the QMS work, a case of dumping, forced and seen through by the US steel industry, was a recurrent topic of discussion. There was some further TQM training, but minor action, substantial planning and coordination on a higher level were continuous characteristics of the development. To a great extent many tasks, using different principles and tools within TQM, were performed in a rather superficial manner; this was also the case in the QS-9000 project, with its extensive and broad requirements that stimulated broad but rather superficial development work. During this work, however, a Total Productive Maintenance (TPM) process was started that incorporated several principles and intentions into the TQM approach. The process was facilitated by a company to which maintenance had been outsourced during the course of the development. This outsourcing gave rise to many arguments and some conflicts stemming from an action-driven production leader that left the company. Via the outsourcing of maintenance a TPM approach was implemented, facilitated by a software instrument for maintenance – Maintech. More systematic maintenance work evolved, involving more operators, but the perception among several persons was that it was expensive.

Via the TPM work several intentions in TQM and several requirements in QS-9000 were somehow realized and satisfied, but much energy was spent on coordinating intentions in QS-9000, from the consultancy firm facilitating TPM, the ERP project and planned activities in the TQM process. It was evident in the spring of 1999, as FSAB received its QS-9000 certification, that the training and continuous processing of requirements, principles and tools in different settings was starting to affect the way people conducted certain tasks; the changes were often on a rather superficial level but also, in some cases, on a rather profound level. Several persons perceived that they needed further facilitation however, and there was still much to wish for, but there was a sense of a positive trend, and several measures were taken to rationalize and facilitate a more efficient and effective process. A new organizational structure was formed and implemented in one of these efforts.

Unfortunately the awareness unfolded on several parts after some important projects had already run into problems that could have been reduced if tools learned during the TQM training had been applied. At the time that positive effects were perceived to be on their way, the market took a financial downturn and there were substantial internal problems. In the case of the ERP project, for example, the problems were acted upon with success at the end of 1999, using one of the TQM tools; another example is a technical project managed by an externally recruited and learning-oriented project manager, who was facilitated in an analysis using some of the tools. The company was in major trouble, however, and at the end of 1999 a new president was installed in conjunction with the problems.

The focus on TQM was abandoned as the new president found it difficult to see any concrete effects of the work, and therefore found it troublesome to defend TQM in the light of the financial situation; the managers of TQM left FSAB, and the new president's view was that many developmental aspects within TQM were the responsibility of the president and should not be managed by other persons. There was a reorganization and shift in focus. QM was redirected towards production and maintaining certificates, and there was an explicit focus on cost reductions via internal measures against problems that hindered profitable operations. Lean thinking and a financial review of the product portfolio characterized the management of the company. There were some disappointments in terms of the TQM development, but many employees also appreciated the new president's measures. A new quality manager, very familiar with the QMS and FSAB's operations was appointed internally. Parallel to the QM changes the final stage of the ERP project was drawing closer, although much development remained before it could efficiently support operations. The QMS was successively developed and refined via the audit system that was developed. Many of the principles and forms of TQM were previously integrated in the QMS and were thereby still part of the operations, even though the focus on TQM had been abandoned.

During this period of focus on internal measures to reduce costs to create a financially stable situation, auditors gave information about the coming ISO 9000:2000 and ISO/TS 16949. In the total context, however, this was marginal, even though several managers showed interest in knowing more about the new system of requirements. There was not at all the same skepticism as during prior introductions of QMS requirements, but instead confidence. Some persons said that the approach used after lessening the focus on TQM was actually closer to the intentions of TQM than before, while others found it to be a closure of a development where benefits of TQM were emerging.

QM From a Company Development Perspective

The purpose of this paper is to examine the development of QM in the perspective of ongoing company development processes. The development at FSAB exemplifies the complexity of organizing QM in a company, e.g. ongoing organizational changes and business cycles are constantly influencing the context of quality management. Interesting to note is that each time the market went down, there was a perceived (and real) crisis. Adjacent to these crises the Company Board replaced the president. The new president brought his (there were only male presidents) agenda into the company and successively designed his own agenda for development. From the perspectives of those working at the company, these president changes influenced the rhythm of development.

A variety of activities and substantial number of management models were introduced at FSAB over the 16-year period, which also characterized the management of QM over time. The content of QM was continuously evolving into an increasingly complex phenomenon encompassing various interlinked components. New concepts and acronyms were continually introduced, and there was an array of perceptions, or models, of what QM stood for among the employees, i.e. some viewed it as being mainly plans and documentation, others viewed it as being a central force in the development, still others viewed it as being a managerial idea without significant meaning, etc.

QM was in the middle of a fight for management time, and at times, other activities such as investments, restructuring, financial problems or other development initiatives took the major part of management's time. Hence, QM was sometimes even seen as disturbing other "more relevant" activities; and "quality professionals", if they were not careful, were perceived to infuse an overload of unnecessary work. Looking at the development at FSAB over time, perceptions of earlier variants of QM influenced the perceptions of new models introduced, as did experiences of earlier failed development activities, e.g. the "Future Project", which was referred to with skepticism during the TQM process.

The effect of history was considerable and influenced the way that the employees perceived and embraced new approached to work. From the case we also see that negative experiences seemed to leave stronger and longer-lasting impressions than the more positive ones did; in fact, employees referred to the Future Project with frustration, more than eight years after the financial crisis in 1990. Hence, as individuals organized their perceptions of new models they did this in the context of all the changes going on. This naturally rendered a large variation of perceptions and attitudes towards QM. The variation in perception can be seen as two dimensional, both over time and from individual to individual.

The staff of the quality department were easily caught up in all kinds of theoretical "quality matters" not leading to action, handling issues generated by internal or external audits or in problem and process analyses. This stimulated a development of more and more ways of organizing 'in theory', without adding any significant value other than for the staff managing the QM system. A system evolved where different professionals rationalized the complex processes in a "virtual reality". Successively, "quality professionals" and other managers started to focus on process maps, quality tools and other theoretical matters instead paying attention to the much more complex mix of activities and humans that together formed the actual processes. Hence, what became clear from our empirical study,, was that there is a risk that a major part of QM-related activities will refer to organizing 'in theory', without a connection to organizing 'in

action'. This is in spite of the fact that the process mapping, the quality tools and other work was intended to render action and improvement.

Another dilemma was that, most often, only a few persons, e.g. the quality manager continuously focused on QM; for the rest of the personnel QM was one issue among many. People temporarily focused on QM, especially in connection with training activities, management actions and audits. However, this focus was often interrupted by many other issues of higher priority. There were problems that needed to be solved instantly, issues of resource management and matters directly related to the core operations. Hence, a gap in perceived priorities easily developed between the quality department staff and other groups of personnel that further enhanced the lack of alignment that Schein (1996) indicates as being a major hinder for organizational learning. Such deficient alignment caused mistrust and a diverging focus.

A QM culture evolved where mainly formal actions, forced by requirements, were taken by managers in the operations. Formally there was a support of QM, but from an operator culture perspective (Schein, 1996) most of the activities under the label "QM work" were part of organizing 'in theory', not of organizing 'in action', i.e. it did not affect human behavior and the way work was done. Actions were often taken for the purpose of gaining legitimacy and not in order to act on genuine needs perceived in the operations. This is in line with Meyer and Rowans (1977) arguments that the "formal structures of many organizations in postindustrial society (Bell, 1973) dramatically reflect the myths of their institutional environments instead of the demands of their work activities" (p. 341). The ultimate aim of QM, however, can be seen as being directed at positively influencing products and processes, and the behavior of individuals doing value-adding activities.

At FSAB, from the introduction of ISO 9000 and onwards, the management of QM was mainly related to organizing 'in theory' with troubles to gain action oriented learning and improvements. The focus was basically on the coordination of general work approaches, philosophies about how to behave, and tools for analysis. This was accompanied by perceptions or models directing the way QM could be implemented, including methods of training. Strong recommendations concerning management behavior and symbolic actions were given and guided the rhetoric while managing QM. Hence, the management of QM at FSAB can be seen as being structure oriented aiming to support value-adding processes. The actions taken were mainly measures 'in theory' to comply with requirements, act on audits, map processes, develop new routines or provide customers or colleagues with some kind of theoretical explanation in quality issues.

There were QM inspired activities in the operations, but these were not recognized by most employees as being part of QM. Instead these activities were seen as an integrated part of the operations and their improvement. QM, on the other hand, was commonly perceived as some kind of theoretical organizing which was not aligned with the more action-driven value-adding parts of the organization. Thus, an inherent dilemma in the promotion of QM was that, when its goal was fulfilled – i.e. a change of behavior and an improvement of work processes - this became part of "daily work", and it was not recognized as being part of or the result of the explicit QM activities. Hence, the contribution of QM to the improvement of the value-adding process was not recognized.

There seems to be a paradox. In order to spread the messages of QM one need to promote it, and at the same time what is successful is integrated and hidden as part of the normal ways of working. This indicates that instead of striving for strong symbols of QM and going into a strategy of promoting QM and its importance in "visual" symbols, the aim should be a type of "invisible success"; a success embedded in all types of processes in which the stakeholders of the company take part. Again, this reveals a paradox, since the case of FSAB also illustrate the problem of not being able to show measurable benefits from the specific QM activities. A risk is that the QM work becomes fragmented due to financial fluctuations and competing initiatives. On the other hand, if it is totally integrated, then it is not possible to cut off the QM activities in a period of financial problems.

Concluding Remark

It is evident that QM as phenomenon in itself is ambiguous and complex to understand, and this points at the complexity of organizing QM. How is it then possible to do research on QM, which is often founded on information from managers of QM? What are the implications of the complexity of QM and of managing QM for research? Many QM models are quite clear on what is important in managing a company; and still, this task, over time, seem to be so complex and so influenced by both exogenous and endogenous forces. To manage QM seem to be like living in a context of a multifold of tensions drawing the attention in diverse directions. How is it possible to comprehend this complexity? How is it possible to understand how to make QM part of the natural organizing in a company like FSAB? What are the characteristics of QM when it has become a natural part? What does this mean, and what type of processes are bringing QM into success?

There seem to be several layers of complexity. Firstly, QM as concept is complex, secondly doing research on QM would then be even more complex, and thirdly the

management of QM, which may be influenced by forces stimulated by research on QM may be even more complex. Perhaps attention is needed on aspects of QM that takes a more intuitive and imaginative approach than often prevailing. Perhaps there is something hidden behind the drive for measuring and attending methods of control in the search for the best way to manage QM? Perhaps the most central elements of QM are impossible to measure or to logically define and present as a successful way? This would then point at the need for an approach recognizing both aspects that can be measured and logically analyzed, and other aspects of the processes that are more intuitive.

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Paper 3

The Problem of Naturalizing Quality Management

Stefan Book

This paper I wrote to deepen my, and others', understanding of the meaning of "the invisible success" proposed in paper 2. However, I was focusing on the process of naturalizing QM, which I view as the journey towards this success. In this paper, I do not focus on FSAB, although I have inevitably been thinking about my experiences from this company while writing.

My aim in writing was to understand the problem of naturalizing QM in a general sense. At first, the paper was a mix of conceptualization in reference to selected theories and in reference to FSAB. After comments on the paper, however, I chose to focus on the conceptualization in reference to theories.

In writing this paper, I developed my ways of expressing the problem of naturalizing QM. In gaining a distance from FSAB, reflecting and writing "freely", I gained a new level and type of understanding of what I was trying to grasp. In parallel, I was writing paper 4. This was a quite inspiring but also strenuous process. Papers 3 and 4, in a sense, fed each other with new thoughts and ideas. Hence, there have been many versions, and many loops of development.

Abstract

The purpose of this paper is to elaborate on the problem of naturalizing quality management (QM). This takes place in three steps, focusing respectively on the concept of naturalizing QM, the process of naturalizing QM as a preparatory stage for exploring the problem of how to naturalize QM, and a general discussion of the problem. The problem concerns the understanding of how QM can become integrated in people's natural ways of doing their ordinary tasks, communicating, analyzing and solving problems. All of this takes place in an organizational structure with complex characteristics. Attention is drawn in particular to two types of tensions in the process of naturalizing QM. The first type of tensions already exists in the organizational structure; and the second type tensions may grow as new principles, practices and techniques are developed, applied and adapted.

Keywords: Quality Management, organizing, naturalizing, tension, structure, process

Introduction

In the analysis of the QM development between 1984 and 2000 at Fagersta Stainless AB (FSAB), Book et al. (2005) suggest a vision of QM which is termed "the invisible success". That is, when QM is really successful it becomes "invisible", in the sense that it becomes part of the natural way that people – top managers, middle managers, engineers, office staff, and operators – are working. It is thus, in a company like FSAB, the intuitive way of handling business, totally integrated in the network of value producing processes. However, much of the QM effort at FSAB, over the period 1984 – 2000, never seemed to lead to natural ways of working. Instead, QM stood out with clear symbols like ISO 9000, and discussions of quality approaches and various methods, explicitly identified as quality tools.

The "quality rhetoric" came from a department explicitly identified with a Quality oriented label. A problem grew at FSAB as quality professionals became the owners of the QM intellectual property, which in various ways should have belonged to everyone in the organization. The goal was that QM should become a natural part of everyone's work. In TQM terms, QM should have been part of creating a world-class organization, hence a world-class system of interrelated processes. However, Easton and Jarrel (2000), investigating companies working on TQM, assert that: "Achieving and maintaining world-class systems is not easy and, frankly, not natural". In this paper, I take a step away from the FSAB study to attempt a conceptual elaboration.

The purpose of this paper is to elaborate on the problem of naturalizing QM. The paper first addresses the concept of naturalizing. This builds up to a discussion of the process of naturalizing QM, which is the baseline for addressing the problem of naturalizing QM. I finalize the paper in a concluding discussion.

Based on the study of the QM development at FSAB, in its context of constant change, I define QM in reference to Bergman and Klefsjö's (2003) definition of Total Quality Management (TQM) and Dean and Bowen's (1994) view of Total Quality (TQ). QM is seen as being a matter of *"constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value adding principles, practices and techniques".* A principle may be to focus on continuous improvement, to focus on customer needs, or to always give people a chance to be involved in improvement work that in some way is relevant for their work. A practice may be a certain way of fulfilling principles or solving problems, e.g. process analysis, Failure Mode and Effects analysis, Affinity analysis. A technique may be one way of conducting a practice, e.g. process analysis through group processes or through

interviews, etc., or following certain procedures in a specific way in practice. People may gradually develop their specific technique of conducting process analysis.

The concept of naturalizing quality management

The term 'naturalize' or 'naturalization' is described in Webster's online dictionary (http:// www.websters-online-dictionary.org/definition/naturalization (or naturalize)) as a verb with different meanings. Individuals or families may be naturalized into citizens of a new country. A story, a wild plant or an innovation can also be naturalized in a new setting or environment. The concept of naturalizing is even used in the Fourteenth Amendment – Citizenship rights, ratified in 1868 – of the US Constitution: "All persons born or naturalized in the United States…" (http://www.usconstitution.net/const.html). In this paper the concept of naturalizing is used in line with the above connotations, but it addresses the naturalization of quality management.

The concept of naturalizing QM can be addressed in terms of institutional theory. By referring to Scott (1995), institutionalizing can be seen as the processes through which cognitive, normative, and regulative structures and activities are created. These structures and activities, according to Scott, provide stability and meaning to social behaviour. They are part of organizational cultures, structures, and routines on different levels of society.

To address the concept of naturalization, with reference to Selznick (1957), is to address the adaptive processes where endogenous and exogenous forces, or developments, are merging and infusing practices and values. Such forces, according to DiMaggio and Powell (1991), successively infuse more homogeneous or similar ways of thinking and acting. Dimaggio and Powell suggest that these tendencies stem or result from: political influence and strivings to be legitimate, responses to uncertainty, and the development of professions. In addressing quality management initiatives, a question is then what types of influences and agendas lie behind the variety of promoted concepts – e.g. TQM, Six Sigma, and quality awards.

Boye and Winsor (1993) pose an argument that several TQM initiatives in the US were founded on Tayloristic "hidden agendas". The TQM initiatives were focusing on designing work tasks, selecting proper workers, setting up systems of inducement, and training and controlling workers; and this took place in a hierarchical structure of power. However, the purpose of naturalizing QM is, in my terms, something else than trying to implement a modern form of Taylorism. And certainly, in my terms, QM is intended to be a positive force in development and not some form of "imprisonment". Quality management should be focused both on reducing problematic variation and on

stimulating beneficial variation, e.g. multidisciplinary views of a problem, complementary ways of working, and creativity in finding alternative solutions.

According to Berger and Luckmann (1967), people are relieved of a considerable amount of tension as an effect of "habitualization" and institutionalization. That is, as people develop certain habits of thinking and acting, and learn "legitimate" behaviour and what works efficiently and effectively, they are relieved of tensions. These tensions may emerge through misunderstandings and diverging views of reality. However, referring to Smith and Amnér (1997), such habitualized and institutionalized behaviour can also reduce creativity. As one central principle of quality management is to systematically engage in improvements and innovations, a low variation in thinking and acting could be counterproductive. Fonseca (2002) even suggests that misunderstandings and tensions are part of patterns of talk that may stimulate new ways of looking upon a situation, a problem or possible solutions. He means that misunderstandings and tensions are central in the early stages of innovation. They are thus central in innovation processes.

Focusing on the creation of innovative thoughts and ways of addressing a problem, former patterns in the way that people address problems or their daily tasks may cause problems and they may be beneficial. In this sense, the problem of naturalizing QM may even be one of both reducing and inducing tensions, depending on the issues at hand. To naturalize QM is about creating stable ways of working and organizing that reduce tensions, and it is about breaking up stability to catalyze creativity and innovation. Referring to the definition of QM in the introduction, these processes take place while developing, applying and adapting certain value-adding principles, practices and techniques.

The influence of QM on the language of the organization can be a central and symbolic part of the process of naturalizing. According to Berger and Luckmann (1967: 68), the language represents shared experiences and it is "both the basis and the instrument of the collective stock of knowledge". Language can be seen as being part of creating a type of stability. Selznick (1957) points at processes that are infusing certain values and structures that will be persistent over time; through these processes, common values and behaviours that persist over time emerge. They emerge in an adaptive and often unplanned way. As indicated above, however, such infused values and behaviours may be beneficial, but they may also cause problems in hindering creativity and innovation.

Former patterns may block the adoption of new ways of thinking and acting. Cole (2000) shows how managers in the US did not "pick up" ideas from the Japanese quality movement due to "institutional factors". The managers did not recognize and understand

the central aspects of the Japanese success in developing quality processes and products. According to Cole (2000), the US managers' prior training, current abilities, denials of new needs, lack of deep understanding of quality, current view of themselves as leaders, underlying feelings that it was not legitimate to learn from Japan, etc., constituted a wide array of factors that hindered effective responses to the "quality challenge".

Relating to the introductory definition of QM, three central findings can be extracted, which are relevant in conceptualizing the problem of naturalizing QM. To naturalize QM is a matter of developing, applying and adapting principles, practices and techniques that can result in:

1. cognitive constructions and normative rules which are carried out through and shaping social behaviour, and which reduce problematic tensions;
2. values and behaviours that persist over time, but which are open for change;
3. efficient and effective patterns of organizing, which induce tensions that stimulate innovation and improvement.

With these findings in the background, the process and problem of naturalizing QM will be elaborated.

The process of naturalizing QM

A variety of ideas are constantly spreading in society (Czarniawska and Joerges, 1996). QM principles, practices and techniques can be seen as part of such processes of spreading ideas. The notion in this paper is that there may be ample variation in how the ideas travel. People are involved in creating new meaning and understanding, in a variety of ways, as they are naturalizing QM. Depending on how this takes place, the effects and tensions will differ (Lewin, 1948); e.g. if people have the opportunity to unfreeze and change former patterns of organizing, then QM may be more efficient and effective.

People alternate between stable structures of work efficient enough to produce value, and structures stimulating change and innovation (Fonseca, 2002). Depending on the tensions produced by QM, people go into new ways of organizing, or they may be drawn back to the prior ways of organizing. That is, they are drawn back to the behaviour and the perceptions prevailing before the change. Relating to Berger and Luckmann (1967), they are drawn back into the habits and typical conduct formed during the history of their social context. Hence, people are drawn back into what used to be natural instead of going into new and hopefully better ways of organizing as a consequence of QM. This

alternation between structures can also be seen as a matter of recurrent changes in a social structure in which people are taking part in processes of organizing.

According to Sztompka (1991, 124-128), people are “actors” in a complex social structure which is formed by interrelated “processes of permanent transformation”. Sztompka elaborates on the contents of social structures and how four types of transformation processes influence people. The transformation processes are shaping and reshaping the rules, norms and values that prescribe certain legitimate conduct, and proscribe what is perceived as wrong; i.e. they are influencing what people do and do not. These transformation processes also shape the ideas, beliefs and images that constitute models or views of reality; i.e. they “constrain and facilitate” actions. They shape and reshape the orientations of actions, and the networks and interactions between people; i.e. they constrain or enable contact and cooperation and they influence communication. Finally, the transformation processes shape and reshape the selection of people who have access to certain resources and facilities; i.e. they constrain or facilitate people’s power, esteem and knowledge, and their opportunities to take action. In this way complementary aspects of an organization can be seen in terms of complex and interrelated processes that influence how people orientate themselves and take action.

The contents and processes of the “social structure” that Sztompka (1991) elaborates can also be expressed in terms of technical, social, political and cultural dimensions (Alänge, 1992). Hence, in addressing QM, instead of focusing on a social structure, it can be more appropriate to refer to an organizational structure. In this way, other dimensions than the social are more easily elaborated as part of the organizational structure, in which the social dimension is one of several. To succeed in organizational changes, Tichy (1983) and Alänge (1992) stress, is a matter of addressing complementary dimensions, concurrently and in an integrative manner.

Alänge (1992) discusses the need to consider four interrelated dimensions – technical, social, political and cultural – in the organizational changes. The technical dimension can be seen as materialized in machinery, equipment, IT, temperature, and meeting places. The social dimension can be seen as materialized in the way people relate to each other: rules, organization schemes, who reports to whom. The political dimension is subtler, but taking part in a larger organization soon illustrates aspects of this nature. The political dimension can be seen as materialized in informal networks, power positions, and the access to information and history. Finally, the cultural dimension is tacit and based on deeply held values internalized in settings outside the organization, e.g. in childhood or during school periods.

Some changes are planned and others take place through emerging or evolving patterns of change (Weick and Quinn, 1999); and both types are intertwined in organizational changes. Relating to Weick and Quinn (1999) change is not an "on-off" phenomenon, and its effectiveness is not contingent on the degree to which it is planned. This is in line with complexity theory, e.g. Stacey (1996) and Fonseca (2002). Nevertheless, planning for change and managing change are central in QM.

To naturalize QM influences the processes of organizing and how these processes are shaping and reshaping the organization. The naturalization takes place in an adaptive process evolving from the merger of inside and outside influences. This process of naturalization may stem more or less from endogenous or exogenous influences. Some organizations grow from a natural way of conducting QM; it is part of their natural principles, practices and techniques. It is within their culture – a culture which, referring to Schein (1985: 19), can be seen as developing the organization's "capacity to survive in its external environment and to manage its own internal affairs". As indicated, this development is related to the processes of permanent transformation, which in turn are related to technical, social, political, cultural and other dimensions of changes. Such transformation and changes take place within an organizational structure, and influence this structure.

The problem of naturalizing QM

In addressing the process of naturalizing QM, we have implicitly addressed the problem of naturalizing QM. The problem concerns the understanding of how QM can become integrated in people's natural ways of doing their ordinary tasks, communicating, analyzing and solving problems. All of this takes place in an organizational structure with complex characteristics. In this perspective, QM, when successful, is "invisible", and value-adding principles, practices and techniques are integrated and natural within the development of an organization. These principles, practices and techniques are relieving and infusing tensions, depending on the issues at hand.

The naturalization of QM relieves tensions by developing common language, cognitive constructions and normative rules. However, QM also induces tensions, as new cognitive constructions and normative rules are developed, applied and adapted, and as existing constructions and rules change. Over time, the process of naturalizing QM infuses certain persistent values and behaviours in an organization, which are fundamental elements of the value-creating processes.

Referring to Lewin (1948), the tensions that emerge during the changes may draw people back to previous levels of understanding and behaviour, but they may also influence

people to change. On the other hand they may facilitate innovative patterns of talk and changes (Fonseca, 2002). Depending on the organization, rules, norms, and values change, or they are further institutionalized, in a confirmation of existing ones. People may articulate new ways of understanding or they may change beliefs, images and ideal structures (Sztompka, 1991). Hence, to naturalize QM would be a matter of recognizing the existing organizational structure, building on it and successively realizing what can be beneficial to change. This change takes place through the development, application and adaptation of principles, practices and techniques.

The problem of naturalizing QM can be seen in terms of tensions, which are produced through processes in the organizational structure, and also through changes in these structures and processes. Relating to Lewin (1926, 1948) and Sztompka (1991), QM may generate destructive tensions, if certain changes lack coherence with other types of changes, e.g. if the opportunity structure and power does not change while changes take place in the values and images of employees. Such destructive tensions indicate that the principles, practices and techniques of QM have not become natural. If they had been naturalized, they would not create destructive tensions (Berger and Luckmann, 1967); they could instead have been part of creating constructive tensions. Relating to QM, two types of tensions can be identified; both types contain constructive and destructive elements. One type of tensions is created while naturalizing QM as such, and the other type exists in the structure but may emerge through QM.

The first kind of tensions is related to the practice of learning QM principles, practices and techniques; hence the tensions are related to the infusion of QM into the organizational structure. This may be compared with learning how to ride a bicycle; it is quite problematic at first, but as you practice, the capability grows into something that is completely natural. At the same time new tensions may be introduced as new and more advanced ways of biking are introduced and learned. Then the value gained from biking may also change – e.g. from the excitement of learning to bike, to being able to transport oneself, to the thrill of biking on one wheel or biking on trails in the woods, to the rewards of taking part in competitions, etc. The first kind of tensions is thus an effect of the characteristics of QM as part of the organizational structure.

The second kind of tensions is related to the organizational structure and the existing processes. Quality management may expose problems or opportunities which are embedded in the organizational structure and in interrelated processes. These problems and opportunities naturally exist without any specific QM activities, and they contain tensions of more positive or negative nature. Tensions may influence people in a positive sense as they are stimulated or see opportunities for improvement. On the other hand such

opportunities, if not acted on, may lead to scepticism or even cynicism (Fonseca, 2002). The tensions may also be related to problems that are frustrating and form hindrances in an organization. The second kind of tensions is thus related to problems or puzzles that are not related to QM as such; instead QM can create value by offering ways of addressing these tensions. Referring to the above metaphor of biking, if people ride on the "QM bicycle" they may see their environment from new perspectives and as they travel on the bike they may develop an understanding of the existing structure, its processes and its evolution. And this bicycle ride may stimulate new tensions that stimulate or hinder development, depending on how people use the bicycle.

While naturalizing QM, people should be stimulated to take part in a type of development that takes place while learning how to ride a bicycle, making use of the successively increased capability in the best possible way. This is about stimulating changes in the existing structure with the aid of QM. The change can be seen as twofold. There is a change in the sense that QM as such is infusing the structure, and there are changes in the structure that take place with the aid of QM as it is infused.

Referring to Weick (1979), the problem of naturalizing QM in an organization would be a problem of infusing QM into the existing procedures, interpretations, behaviours and puzzles that constitute an organization. The organization is, however, also constituted by interrelated processes that are conditioned by different aspects of the structure – e.g. technical, social, political, cultural. Hence, the problem of naturalizing QM is a matter of constantly striving to recognize, understand and act on patterns that exist in the structure, and which are produced while naturalizing QM. This calls for leadership that can handle challenges of diverse nature. It seems that the difficulty of this task requires a core competence in orientating and taking actions together with other people. This is at the core of the motives to view QM as described in the introduction. QM is seen as a matter of *"constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value-adding principles, practices and techniques".*

Orientating and taking action are seen as two types of processes that may take place in a fusion of action and reflections (Schön, 1982), or they may be more separated in a sequence of orientating – taking action – orientating – taking actions. People may also orientate to gain awareness and find direction, but without taking actions based on what they find. As people take action they perform an intentional operation, with a specific direction that is found while orientating. The key here is "intentional". In fact, a person may do nothing as an intentional operation, which is then seen as taking action, for example to make a statement. To hunger-strike would be such an action. Taking action

may also be to intentionally take a pause and let other people talk, or to let people develop their own way of orientating and taking actions. To orientate and take actions in an efficient and effective way is therefore about good timing. Depending on the situation and local conditions in an organization or a group, different actions may be appropriate. To investigate which actions may be appropriate is a matter of orientating before taking action.

A person taking part in an orienteering competition is, in this terminology, orientating while studying the course and figuring out the position, and is taking action in the running and the stamping of the "card". Hence, the combined capability of orientating and running contributes to the capability of orienteering. When it comes to QM the orienteering race is a matter of fulfilling and preferably exceeding customer needs and expectations. To naturalize QM involves naturalizing certain principles, practices and techniques that can aid people as they orientate and take actions. This is likely to be an ongoing process of transformation, within a structure containing issues of e.g. technical, social, political and cultural dimensions.

Referring to Schein (1996), these processes takes place among different cultural communities – CEO, engineering, operator – having their specific language and cultural characteristics. If successful, the development, application and adaptation of QM principles, practices and techniques, are aligning these cultural communities in a "language" and "culture" of quality. Such language is cross-disciplinary and it is oriented at aligning multiple disciplines into a whole. However, there is a mutual adaptation of the "QM language" and the language of other disciplines or communities – e.g operators, engineering, CEO, finance, marketing, logistics and production. The QM language addresses the interfaces between the disciplines and communities; it is a process-oriented language since QM addresses cross-disciplinary processes and proficiencies. This indicates how QM can be delimited in relation to other disciplines in building an organization, and thus how QM fits naturally in the organizational structure. And by developing, applying and adapting value-adding principles, practices and techniques, people can develop the processes and the interrelated organizational structure to fulfil or exceed customer needs and expectations.

Discussion

I have conceptually elaborated the problem of naturalizing quality management (QM). This is a complex and multifaceted problem, which can be addressed in terms of understanding the process of naturalizing QM. The naturalization of QM takes place via the habitualization and institutionalization of certain ways of orientating and taking

actions. It also takes place through changing and improving currently inefficient and ineffective ways of orientating and taking actions. In quality management the development, application and adaptation of certain principles, practices and techniques, are the foundation in these changes and improvements.

During the naturalization of QM there is, however, a risk that QM professionals create a misaligned cultural community, with its "unique" language that most people are unable or unwilling to adopt. The risk is related to the creation of a cross-disciplinary language which some people, the QM professionals, have as a first language and other people have at best as their second language. Hence, the principles, practices and techniques that are promoted within a QM approach may not become part of the habitualized and institutionalized behaviour. Instead, QM is constantly promoted by those belonging to the "QM community", and people with other special competence – marketing, logistics, production, product development, etc. – may be pushed away. This may be a process where QM professionals promote their "intellectual property" as something that all people of the organization need to understand although it is the "QM department" or the "QM people" who really know what is needed. In this sense QM may become part of power games and political processes driven by competition for power.

On the other hand, the QM language may be cross-disciplinary, developed, applied and adapted in terms of principles, practices and techniques that people form jointly. Naturalization of QM would mean that the QM language and the language of other disciplines adapt mutually in an evolving process. Hence, the process of naturalization can be seen in terms of a process of mutual adaptation between QM and other disciplines. Principles, practices and techniques successively evolve as part of improving processes and the organizational structure. In this evolution, the capability to satisfy or preferably exceed the needs or requirements of customers may successively increase. The question is how this can take place.

Leigh Star and Griesemer (1989) and Czarniawska (1996) illuminate the fact that people always develop their own individual interpretations and definitions, even if we strive for coherence in definitions and understanding. Hence, for QM to be really naturalized it must take an approach which recognizes the variation in people's ways of organizing and interpreting. This perspective emphasizes heterogeneity rather than homogeneity in organizing as a driving force in QM. Rather than striving for uniform ways of organizing, people should connect through the language of quality, while also adding their personal ways of orientating and taking actions relating to their discipline, competence and personality.

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Paper 4

Modes of Organizing in Quality Management

A way of understanding

Stefan Book

This paper, together with paper 1, was the most challenging one to write. Successively my understanding of the problem of naturalizing QM emerged in writing paper 3. In parallel, I was working on a way to develop an understanding of this problem. I was looking for a way of communicating about processes of naturalizing QM and about the problems in these processes. I had a general interest in this problem, since I believed that it was central in organizations and society.

As I met people – an optician, a medical doctor, a social insurance official, a teacher, a quality manager, etc. – who asked about my research, I described in rationalized terms that I was trying to understand why organizations gain or do not gain actual improvements from new principles, practices or techniques. It did not take long before most persons exemplified from their own organization or experiences. This was inspiring, but I focused on understanding the development and problem at FSAB.

Gradually my investigations led to a view where I started to understand the problem of naturalizing QM in terms of how people were working in different ways. Depending on the "modes of organizing" in which they were orientating and taking actions, they attended to activities or problems in different ways. This paper can be seen as designing a way of understanding the problem of naturalizing principles, practices and techniques.

Abstract

A study of the quality management development at Fagersta Stainless AB (FSAB) pointed at the variety of ways in which people – top managers, middle managers, office staff, engineers, operators and consultants – were orientating and taking actions. Depending on which of several modes of organizing that characterized their work, they were addressing e.g. new ideas, methods, requirements, visions, and prior experiences in different ways.

The purpose of this paper is to develop an understanding of the problem of naturalizing quality management (QM). This problem concerns the understanding of why principles, practices or techniques become, or do not become, part of the natural ways of fulfilling customer needs.

The paper proposes that people were orientating and taking actions in fourteen 'modes of organizing' – specializing and integrating, 'ideal state' and emergence, conformity and learning, exploration and exploitation, stability and flexibility, procedure and process, 'in theory' and 'in action'. By referring to the FSAB case, the paper illustrates each of the fourteen modes and discusses the problem of naturalizing quality management. The concluding reflections refer to selected theories while giving some more general and tentative suggestions on the nature of the problem of naturalizing QM.

Keywords: Quality Management, modes of organizing, naturalizing, pattern.

Introduction

During the past two decades, quality management (QM) has been a central theme on many managers' agenda (Cole and Scott, 2000). The emphasis has been shifting and so has the terminology applied in the promotion of quality-oriented work. Along with these shifts in attention there has been a diffusion of a variety of QM concepts and standardized requirements, e.g. ISO 9000:1987, 1994, 2000, QS-9000, TS 16949. These concepts and requirements have been accompanied by numerous studies. Prior QM-related research indicates, for example: major problems and solutions (Beer et al., 1990), the effects of organizational context (Benson et al., 1991), key issues for sustainability (Dale et al., 1997), patterns in deploying TQM (Easton and Jarrel, 2000), the relation to innovation (Prajogo et al., 2001) and the strategic impact of QM (Leonard and McAdam, 2002). To view patterns in the development over longer periods of time, recognizing contextual factors influencing development has not been common. However, Cole (2001) gives such a perspective on the early years of the quality movement in the US, going back to external influences from Japan and internal influences originating in the US.

This paper is grounded in my involvement at Fagersta Stainless AB (FSAB), a Swedish manufacturer of stainless steel rod and wire rod, which is an example of many companies that have met a variety of QM models and QM requirements over time. I was responsible for leading the work towards a QS-9000 certificate and acted as a change leader facilitating TQM between 1997 and 2000. To comprehend and understand the QM development between 1997 and 2000, I cooperated with the Quality and Development manager in an investigation of the QM development at FSAB between 1984 and 2000 (Book and Solly, 2005). During the latter half of the 1990s the company had an average of approximately 350 employees, and an average turnover of approximately 1500 Mkr.

A central theme, during the study, was to relate the QM development to its context of e.g. financial fluctuations, restructuring, parallel internal change projects and replacements of leaders. In retrospective analyses of the data from FSAB, making QM a natural part of organizing at FSAB stood out as a central problem that deserved elaboration. Referring to (Book et al., 2005), the problem of naturalizing QM was indicated, but it was expressed in terms of an "invisible success". That is, when successful, the QM work becomes integrated and invisible, as a part of people's' natural ways of organizing. Further reflections resulted in a terminology for describing the problem of naturalizing QM, which was elaborated in paper Book (2006).

The purpose of this paper is to develop an understanding of the problem of naturalizing quality management. This problem concerns the investigation of why principles, practices

or techniques become, or do not become, part of the natural ways of fulfilling customer needs. A principle may be to focus on continuous improvement, to focus on customer needs, or to always give people a chance to be involved in improvement work that in some way is relevant for their work. A practice may be a certain way of fulfilling principles or solving problems, e.g. process analysis, Failure Mode and Effects analysis, or Affinity analysis. A technique may be one way of conducting a practice, e.g. process analysis through group processes or through interviews, or following certain procedures in a specific way in work.

The paper first conceptualizes QM before addressing "modes of organizing" and "orientating and taking actions" as concepts. This is followed by a rather substantial description of the methodology. Then the fourteen modes of organizing – specializing and integrating, 'ideal state' and emergence, conformity and learning, exploration and exploitation, stability and flexibility, procedure and process, 'in theory' and 'in action' – are illustrated by referring to the FSAB case. The illustration of these modes opens up for a way of understanding the problem of naturalizing QM, which is applied in a discussion of how to understand this problem. The paper concludes with reflections which also give some tentative suggestions for further study.

Conceptualization of QM

To investigate QM implies dealing with an ambiguous concept. There are several definitions of QM, and several definitions of Total Quality Management (TQM) representing variants of QM. Dean and Bowen (1994) address the concept of Total Quality (TQ) and point at the confusion regarding the concept. Some authors have studied QM or TQM by referring to quality awards such as the Malcolm Baldrige National Quality Award or the Swedish Quality Award and their contents, e.g. Hendricks and Singhal (2001) and Hanson (2003). They find that in the long run serious TQM work will have great chances of yielding positive development. However, in a study of QM in a company, it may be problematic to define what is studied, since QM is defined by practitioners in a performative sense, indicating what it has "become" in the specific company in question (Czarniawska-Joerges, 1996). Nevertheless, I have attempted to define QM in a way that represents my way of comprehending.

Based on the study of the QM development at FSAB in its context of constant change, I define QM as follows, with reference to Bergman and Klefsjö's (2003) definition of Total Quality Management (TQM) and Dean and Bowen's (1994) view of Total Quality (TQ):

Quality management is a matter of constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value-adding principles, practices and techniques.

To "orientate" involves gaining awareness and finding a direction. In Merriam Webster's online dictionary, orientating means to "determine one's position with reference to another point" (http://www.websters-online-dictionary.org/definition/orientate). While 'orient' may be used as a synonym, in this paper the term 'oriented' is used to indicate a state of directed attention, e.g. process-oriented, quality-oriented, or result-oriented. Hence, by developing, applying and adapting certain principles people can orientate and take action and thereby develop a process-oriented way of organizing.

Modes of organizing

Researchers have applied the concepts of "modes of organizing" or "organizing modes" in prior studies, e.g. Edström and Tullberg (1998) and Dunbar and Garud (2005). The latter authors use the concept of "organizing mode" to address norms that facilitate a particular way of using organizational knowledge; depending on the organizing modes, what is perceived as significant varies. To clarify the meaning of modes of organizing in this paper I will address the concept of organizing first.

There are several conceptions about organizing but, according to Czarniawska-Joerges (1996: 3966), Karl E. Weick has given "the most clear and succinct formulation of a process view". In Weick's (1979: 3) terminology, organizing is a matter of assembling "ongoing interdependent action into sensible sequences that generate sensible outcomes". Already in making sense of a concept like QM people investigate the meaning of the term in relation to ongoing actions. They take part in various processes while bringing in their preunderstanding (Gummeson, 1991); and they orientate themselves and their actions toward a variety of possible foci. Hence, the attention is directed in a certain way and towards a certain focus. People, depending on their preunderstanding, organize what they experience differently, which influences the way they organize while they develop, apply and adapt principles, practices and techniques.

Depending on their modes of organizing, people understand what they experience in a variety of ways. This can be compared with the influence of "mental models". Senge (1990: 8) suggests that mental models "are deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take actions". Mental models can be seen as a way of seeing which has been

developed and which influences what and how people understand. Modes of organizing, in a similar manner, influence what and how people understand; depending on their modes, people orientate and take action in a variety of ways.

Orientating and taking action

Referring to Leigh Star and Griesemer (1989), people orientate and take actions differently depending on their viewpoints and intentions (purposes), and numerous factors – common goals, agreements, standardized methods, and ways of communicating – influence the results of their activities. People act while they are involved in any type of activity such as thinking, reflecting, talking, listening, walking, arguing, suggesting, reading, and carving. To take action is seen as an intentional operation with a specific direction which is found while people are orientating.

In clarifying the meaning and difference between orientating and taking action, an example from Weick (1995) serves as an aid. Weick (1995, 30-31) explains that "…the action of saying makes it possible for people to then see what they think…they act and in doing so create the materials that become the constraints and opportunities they face". The action of thinking and saying and seeing what one thinks, and developing those thoughts together with others or via analyses, is here seen as a part of orientating. Hence, in handling a severe problem, people orientate before they take action to actually solve the problem. On the other hand, from another perspective, people orientate before or while they are taking action and saying something important to another person. Hence, the term is used in a relative sense, depending on the focus of the action.

Orientating and taking action are seen as two types of processes that may take place in a fusion of action and reflections (Schön, 1983). As people take action they perform an intentional operation with a specific direction that is found while orientating. The key here is "intentional". In fact, a person may do nothing as an intentional operation, which is then seen as taking action, for example to make a statement. To hunger-strike would be such an action. Taking action may also be to intentionally take a pause and let other people talk, or to let people develop their own way of orientating and taking actions. To orientate and take actions in an efficient and effective way is thus about good timing. Depending on the situation and local conditions in an organization or a group, different actions may be appropriate. To investigate which actions could be appropriate involves orientating before taking action.

A person competing in an orienteering competition, is in this terminology, orientating while studying the course and figuring out the position, and is taking action in the running and the stamping of the "card". The combined capability of orientating and

running contributes to the capability of orienteering; and this notion is central to the definition of QM in this paper. As will be seen, I propose that depending on the mode of organizing, the nature of orientating and taking action differs, and so does the foci of attention.

Methodology

The paper is grounded in a successive search in complementary data, to develop an understanding of the QM development at FSAB, between 1984 and 2000. The data came from: collections of documents during my involvement as an employee, for slightly more than three years (1997-2000); participatory observations, during ordinary business and as part of being responsible for satisfying QS-9000 requirements; planning and holding staff and management training; and retrospective interviews after the three years as an employee. The reason why I collected data during my employment was that I had been planning to do research together with associate professor Sverker Alänge at Chalmers. At the end of 1998 a formal decision was made that I could use the data for research and also continue to investigate the development.

The nature of the research leading to this paper can be illustrated by referring to Alvesson and Sköldberg (2002: 52). They metaphorically explain a common characteristic in hermeneutic research: in this type of research intuition is central, and "patterns in complex wholes are illuminated by a kind of mental flashlight". In this paper I have interpreted and made sense of my experiences and data from FSAB. In the work I have also used my intuition in the interpretations of data and of my experiences. The work leading to the paper can be seen in terms of four phases of investigating and analyzing the QM development at FSAB. The first two will be briefly described before concentrating on the third and fourth phases.

Phases 1 and 2

In May 1997, the quality and development manager, Barry Solly, hired me as a project manager responsible for leading the company to a QS-9000 registration. For slightly more than three years (1997-2000) I was an employee, and I used the opportunity to gain extensive access to data on the QM development. However, I was in the middle of central projects and had a heavy workload; hence, I did not write anything or conduct any analysis until after my FSAB period. I took notes, but in a rather fragmented way, but I was constantly involved in communicating with a variety of persons in diverse situations. Most of all, I was cooperating closely with the staff at the quality department and with the quality and development manager, Solly.

Solly was employed by Fagersta AB in 1974, after earning his Ph.D. in materials science and working in stainless steel development for some years in the nuclear industry. Until 1984 he was involved in research and development, technical market support and process development at Fagersta AB. During the final phase of a major restructuring of Fagersta AB, Solly was the manager of technical market support and process development. He became the Quality and Development Manager of FSAB when the company was constituted in 1984; in this role, he was part of the top management team from 1984 until 2000. After leaving the company he cooperated with me in the investigations of the quality management development to further our understanding of the development. Hence, he has been involved in all of the four phases of investigations.

The first two phases took place from 1997 onward, during the three years that I was an employee at FSAB. In these phases, strategy documents, offerings from consultants, planning documents, minutes from meetings, and notes from meetings were gathered. I had the roles of being a project manager for satisfying the QS-9000 requirements originating in the US automotive industry and of being a facilitator in the ongoing TQM work. During the first phase, I investigated and developed my preunderstanding of the FSAB operations, of ongoing QM and contextualizing projects, and of the "culture" at FSAB. This facilitated my further work at FSAB. The first phase also included studies of QS-9000 and how FSAB could address these requirements.

During the second phase – basically from 1998 onward – I was an actor successively developing my understanding of FSAB and taking an active role in the development. I was involved in the strategic TQM work, facilitated various workshops, and took part in the planning and execution of management training and staff training. Furthermore, for approximately half a year during 1998 I was part of the steering committee and project management in the implementation of an Enterprise Resource Planning system. From 1998 until 1999, the president, Solly, the personnel manager, and I had regular informal reflective meetings – "VU-träffar" (business development meetings).

During my three years of employment at FSAB, I met recurrently with operators, office staff, engineers, middle managers and top managers. During the latter half of my employment a constellation with the president, the quality and development manager, the personnel manager and myself met on a regular basis to reflect on the development and to find directions; these meetings took place approximately once a month. Furthermore, Sverker Alänge from Chalmers University of Technology, who had been in contact with FSAB from 1994 until 1999, was a conversational partner along the way. The two phases contributed to an improved preunderstanding and access to data in the third and fourth phases, when I was no longer an employee at FSAB.

Phase 3

Initiating the third phase, which lasted from 2001 to 2005, interviews were planned and conducted during the spring of 2001. Approximately half a year after I had left FSAB 22, unstructured and explorative interviews were conducted. Together with the former quality and development manager (Solly) I interviewed 20 employees having diverse roles at FSAB, and one president of a supplier of maintenance service. Then I interviewed the president between 1992 and 1999 during a day in the spring of 2001. Finally, I interviewed a management consultant who had facilitated staff and leadership programs at FSAB. In total, in cooperation with Solly, I conducted 23 interviews to gain interpretations from presidents (2), other top managers (5 persons), middle managers (7 persons), operators (8 persons), union representatives (5 persons, representing different unions), the president of the maintenance services supplier, and external consultants (2 persons). Among these persons we also got an engineering perspective on the development. Of the 23 interviewees, seven provided dual perspectives, e.g. operators who were also union officials. This is why the sum of the interviewed persons is counted as 30 instead of 23.

All employees interviewed were informed that their perspective (personal experiences and perceptions) were sought in order to get several perspectives on the development at FSAB. We also made clear that this investigation had nothing to do with further development at FSAB. Both Solly and I had left the company, and we had no stakes in relation to FSAB. All the interviews were digitally taped (with one exception) and notes were taken during the interviews to facilitate later processing. After asking the interviewees about their roles and when they started at the company, an explorative interview occurred where open questions were combined with follow-up questions to check statements that seemed unclear.

The immediate impressions and notes from the interviews were summarized in direct connection with the interview occasion. Data from the interviews then complemented the existing documentation from the previous two phases. The collected documents were organized in a longitudinal manner. Next, on the basis of these documents I described the QM development and contextualizing events with the former quality and development manager as a reflective partner and expert on FSAB and its core technology (Book and Solly, 2005). The researcher from Chalmers also contributed substantial data and his perspective on the development; he had been in contact with FSAB between 1994 and 1999

During the third phase I tested a number of conjectures influencing what could be central to analyze in the QM development at FSAB. First of all, theories of change presented by,

for example, Lewin (1948), Beer et al. (1990), and Abrahamsson (2000) stimulated the examination of the data. This led to focusing on learning processes as described by, for example, Argyris and Schön (1996) and Senge (1993). In this investigation, the notion grew that a central theme could be to analyze the development in terms of the institutionalization of ideas and requirements coming from the outside and patterns emerging from the inside of FSAB; see for example Berger and Luckmann (1967), Scott (1987, 1995), and Meyer and Rowan (1978). While reflecting and writing, focusing on ideas from institutional theory, a new theoretical conjecture emerged from figuring out how to analyze the data. This conjecture was related to diffusion of innovation theory. The QM models and ideas could be seen as 'innovations' brought into the organization; see e.g. Alänge et al. (1998) who elaborate on such a perspective. This way of looking at innovations was also inspired by Roger's (1995) examination of research on, and central aspects in, processes of diffusion of innovations. To recognize the 'social units of adoption' is one central aspect to consider in the diffusion of innovations perspective. Along the way, certain theories of organizational culture complemented the other perspectives; especially Schein (1985 & 1996) inspired a perspective on how culture and subcultures form and how misalignments between subcultures may hinder learning. After these thought trials, Weick (1979 & 1995) gradually became a central source of inspiration.

Some of the chosen terms were influenced by particular references, but the concepts were both empirically identified and defined as modes of organizing. March (1991) influenced the use of the terms 'exploration' and 'exploitation'. I use the concepts in relation to QM as such, pointing at the development of existing QM practices, or the search for new practices and influences outside the existing QM. March uses the concepts in relation to the organization, when people exploit what exists within the organization, or they explore new opportunities, i.e. in the market, in new markets, in new competence or in new technology. Hoyle and Thompson (2002) inspired the use of the term 'conformity' and the difference between 'procedure' and 'process' modes. And Weick (1979) influenced the use of the terms 'stability and 'flexibility'. Furthermore, the terms 'In theory' and 'in action' can be partly traced back to Schön (1983) even though this was realized retrospectively while reflecting on the sources of the concepts. I am sure that the other concepts in some way are influenced by a combination of theories; however, the above are the most evident.

The investigations have been inspired by a continuous search for possible ways of understanding the data and experiences from FSAB. I have tried to contribute a reflexive analysis (Alvesson and Sköldberg, 2000) in which diverse conjectures stimulate contrasting and complementary views. I believe that the preunderstanding founded on

experiences from QM in practice at FSAB has also contributed in this reflexive analysis. During the fourth phase Weick (1979, 1995), combined with some authors' thoughts on methodology, further stimulated the analysis of the data and experiences from FSAB. My interpretations of Pool and van de Ven (1989), Weick (1989), Strauss and Corbin (1990), Gummesson (1991), Czarniawska (1999), Alvesson and Sköldberg (2000) and Dahlbom (2002) inspired my analyses of the data. I found that the exemplified authors presented a pragmatic and refreshing view of what is central in qualitative research. These authors, to my mind, contrasted for example with Eisenhardt (1989) and Yin (1994), who I assess as having a type of quantitative line of reasoning in, for example, their arguments for multiple case studies.

I find it highly problematic if researchers, as I interpret for example Eisenhardt (1989), believe that it is possible to "statistically" generalize about complex organizational phenomena. Personally, I came to be more in line with Dyer and Wilkins (1991) and Gummesson (1996) who assess that you may just as well make analytical generalizations from single case studies as from multiple case studies. Why? Because processes of organizing are so complex that the essence of qualitative research is not to gain statistical evidence on matters that cannot be analyzed with quantitative arguments. However, more quantitative investigations may complement qualitative analysis.

From my experiences as an employee at Volvo, Saab and FSAB, I brought with me a preunderstanding that resulted in a rather critical perspective on "data". In my view, what was taking place in organizations was so complex that it took more than collecting a set of data and then searching for correlations if one was to address processes of organizing. Taking part in a wide quantitative analysis of improvement work in Swedish health care (Book and Hellstöm, 2003) and conducting a qualitative comparative study of two improvement projects at Chalmers University of Technology further strengthened this critical view. This increased the respect for and value of bringing forward, in some way, a rather subjective view of what was central in the study of FSAB.

In my perspective, to stick with one case and investigate and test various conjectures, using complementary sources of data, in combination with intuition, may contribute another type of richness than searching for saturation or richness (Strauss and Corbin, 1990) via multiple cases. This is not to say that the single case study is necessarily richer than multiple case studies; it may be rich in another way or in a similar way. However, in cases, the more subjective and intuitive aspects of research can contribute to interesting ways of understanding a certain phenomenon. Relating to Kvale (1997), the contribution of more subjective findings from an investigation is not an unbiased presentation or analysis; instead it has the potential of bringing new dimensions or perspectives forward.

This, according to Kvale (1997: 258), can lead to creation of knowledge founded on multiple perspectives.

The modes of organizing, and the discussions of their interactions and relevance for understanding the problem of naturalizing QM, are founded on multiple perspectives and multiple data sources. After some time of investigating the data from FSAB there seemed to be an interesting pattern that I could not quite grasp with the aid of structures and procedures. I refer to how I planned, codified and analyzed my data; I continually searched for patterns in details and in the whole of the data, and I alternated between different thought trials as I found something interesting.

In line with Czarniawska (1999) I successively acknowledged the relevance and depth of my own understanding from being a practitioner of QM at FSAB. Instead of following certain models or procedures for research, I was further strengthened by, for example, Weick (1989: 524-525) and Dahlbom (2002: 27-28) in my process of more intuitively investigating a variety of conjectures. That is, I conducted a number of thought-experiments in dialogues and through revisitation of the data from different viewpoints, with alternating and overlapping conjectures in mind. With the above as background, the fourth phase was initiated.

Phase 4

During the fourth phase I investigated the development at FSAB, facilitated by the preunderstanding developed in the prior three phases. The fourth phase can be seen in terms of overlapping stages, of organizing and analyzing the data and experiences from FSAB. I first summarized the development at FSAB and made a first broad pre-analysis together with my Alänge, and the former quality and development manager, Solly, at FSAB (Book et al., 2004). We analyzed and discussed the development while presenting a wide array of tentative findings and a few suggestions. These tentative findings and suggestions were summarized in Book (2005); see Table 19 below.

- QM is in the middle of a fight for time.
- QM activities may be seen as disturbing other “more relevant” activities.
- There may be a gap in priorities between the “QM staff” and other personnel.
- Often there are only a few individuals who focus on QM over long periods of time.
- QM is often interrupted by other activities with “higher priorities”.
- There is a risk that actions are taken only to gain legitimacy and not to act on actual needs.
- There is a risk of a QM culture where only formal actions, forced by requirements, are taken by managers.
- Actions are taken and there is formal support for QM, but many of the activities going under the label “QM work” are low in substance, i.e. they have minor practical impact on the work.
- Quality professionals may be perceived as infusing an overload of unnecessary work.
- QM in practice offers a structure for value-adding activities, but actions taken are often measures in theory, i.e. they are often rather superficial actions of, for example, changing a document or adjusting a plan.
- QM is often seen as theoretical organizing, not aligned with the more action-driven parts of the organization.
- The QM staffs are easily caught up in all kinds of theoretical quality matters as a consequence of e.g. audits or process mapping, which fail to act on actual needs.
- A dilemma for QM is that when its aim is fulfilled the resulting action becomes part of daily work; hence the contribution from QM may not be recognized.
- More efficient ways of organizing in theory risk leading to rationalizations in a fictive virtual reality that alienates QM from the actual operations.
- The broad scope of models such as ISO 9000:2000 and quality awards may cause a negative view of QM because of an unbalance between organizing in theory and action.
- Unbalance between exploration and exploitation of ideas or models can hinder a sustainable development.
- QM is based on several models competing for attention, and it is changing over time.
- The model of process-oriented work as being a matter of understanding frequent work flows needs to be adapted to a more dynamic and historical view of processes.
- Perceptions of earlier QM work affect the current QM initiatives, and negative experiences seem to last longer than do positive experiences.
- An “official company development history” can be developed via a kind of process mapping that can stimulate a view on current activities where previous efforts are still valued.

Table 19 A list of tentative findings in Book et al. (2004) (from Book, 2005)

As can be seen in Table 19, we arrived at a flora of tentative findings and we needed to gain focus on key points. At this stage we had gained an overview and developed our understanding of the development at FSAB; however, the direction of further investigations was unclear. We searched for a way to concentrate further investigations. The opponent (José Fonseca) on my licentiate thesis was central in the breakthrough in this search. After discussing the FSAB study in my licentiate seminar, further investigations of the FSAB case came to focus on the problem of naturalizing QM. First we reanalyzed the development in Book et al. (2005) based on a revised description in Book and Solly (2005). Then I started to elaborate on how to explain this problem in more general and conceptual terms (Book, 2006), to develop an understanding of the problem.

In line with Weick (1989) I 'tested' different conjectures in dialogues and in reference to the data from FSAB. I worked with the data from FSAB and reflected on a variety of ideas together with my supervisors. The conjectures that seemed interesting and that contributed more than others were kept and others were abandoned. A way of thinking evolved into a way of describing the QM development at FSAB and what was influencing the naturalization of QM. Referring to Poole and Van de Ven (1989), the identification of modes of organizing was conducted by looking for contrasts in terms of tensions and paradoxes that could facilitate theory generation.

The modes were addressed in terms of contrasting pairs to facilitate the illustrations of modes that were identified as central for understanding the QM development at FSAB. This was a matter of facilitating my reflexions in relation to data and dialogues concerning the plausibility of a variety of conjectures. In a variety of dialogues and in interpreting the experiences and data from FSAB, twelve modes emerged – 'ideal state' and emergence, exploration and exploitation, procedure and process, conformity and learning, stability and flexibility, 'in theory' and 'in action'.

To tentatively 'test' whether addressing the modes could facilitate an analysis of the development at FSAB, I analyzed the description of the QM development in Book and Solly (2005). I marked up and commented on parts of the descriptions in intuitive comments with the aid of the terms identifying the modes (the 'insert comment' mode in Microsoft Word, with 'balloons' at the sides of the pages, being used in this work). On the next page, comments S60 and S61 have been extracted from my analysis of Book and Solly (2005). The marked text represents the mark-up in the paper which was connected to the 'balloons'.

Extract from working paper (Book and Solly, 2005) and comments S60 and S61 which are the 60th and 61st comments out of 221.

"QM is still conducted mainly via internal and external audits. By this time the staffs at FSAB are used to the audits as a recurrent event and as one tool to develop the company. This development only addresses the basic requirements within ISO 9002, and most often different improvement activities are limited to changes in documents or plans. That is, the procedures are tuned and actions are taken to conform to requirements and findings during the audits."

Comment S60: "Exploitation of ISO. The procedure-oriented ISO work also led to rather procedure-oriented exploitation and perhaps not to a process-oriented and flexible work approach directed toward learning rather than conformity".

"After some time of incubation the President and Q&D Manager try to engage the Researcher at Chalmers in the implementation of TQM at FSAB. This is not an easy task, as it is very hard to get hold of him; and the President finally asks one of the staff at Chalmers if he "has gone underground". When they finally locate him the Researcher has a full agenda. The Researcher accepts the assignment to facilitate FSAB. However, not until the spring of 1995 is there a concrete plan for the continuing internal work; an internal 7-day training program is on the agenda for the autumn of 1995."

Comment S61: "They want the researcher to facilitate the work but they have not taken any actions themselves. They have not gone into a learning process stimulated by exploiting the tools that they have learned. They want more persons to explore the new tools. It seems that they are looking for some kind of stable platform for development rather than going into a flexible and emergent journey of learning about their processes. In this way the procedure and "in theory" oriented work is probably being preserved in a situation when this probably needs to change so as to gain legitimacy in the organization."

In total, 221 comments were made where all of the twelve terms were used in several places to give analytical comments in line with the above example. While analyzing and commenting on the text in Book and Solly (2005) I further developed my grasp of the modes, of what was central, and of how they could be understood. At this stage, I had a 'model' of modes that contributed to my own understanding of the QM development at FSAB, but I needed to test the line of thinking further in dialogues with people. Could I contribute an interesting and useful way of organizing as the concepts were applied in dialogues? Did it make sense to other persons? And how was this related to the problem of naturalizing QM?

I discussed the development at FSAB in numerous dialogues, and reflected on how to understand the problem of naturalizing QM. First of all, I recurrently reflected with my supervisor Alänge, and discussed numerous thought trials. I talked to representatives in industry – e.g. in consultancy firms, in a multinational company, in a service company focusing on transportation and logistics – and I talked to the former quality and development manager at FSAB, who expressed that this way of thinking about modes of organizing gave a deeper and better perspective on his experiences from FSAB. Furthermore, a manager in the pharmaceutical industry expressed that this made sense, and that she could see her managerial role in a new light in terms of these modes.

I also took the chance of making sense of the modes of organizing in preparation of and during lectures for students; and I reflected on the modes as I supervised master theses, e.g. one thesis investigating the design change notice process at Volvo Skövde, and one thesis investigating how to make the global development process of at Volvo 3P more robust in a certain stage of development.

During one of the dialogues with my second supervisor, Professor Bo Bergman, I became convinced that two complementary modes – specializing and integrating – added value to the whole. Bergman reflected on how he often presents process-oriented work in terms of either strengthening specialization or stimulating integration of complementary ideas or activities. As he described this perspective, I could bring up several examples of the relevance of these two modes for understanding patterns in QM at FSAB. I was now convinced that the modes of organizing offered a way of understanding the problem of naturalizing QM.

At this stage, I had a conception of the problem of making QM natural and the process of naturalizing QM. I had also tested the way of thinking in codifying and analyzing the development by going back to Book and Solly (2005). I was also convinced that the way of thinking represented by the seven pairs of modes could contribute a way of

understanding the problem of naturalizing QM. However, I had still not illustrated the modes in any other way than in dialogues and as thought trials; hence to write this paper was still another step in the process of organizing and making sense of the experiences and data from FSAB.

In line with Kvale (2005), who describes the process of writing as one of making sense, I needed to go through a more systematic process of writing and illustrating the modes and the central points. I went back to the data to extract quotes that could be beneficial in illustrating the nature of the seven pairs of modes and how they related. I started with a flora of quotes and successively organized them and refuted some as less relevant when I tried to use them for illustrations.

To test the relevance of addressing modes, one could read the quotations and think about the development at FSAB without having the seven pairs of concepts in mind. Clearly, the meaning of the quotes would diverge from the meaning created in this paper. Another test could be to take one of the quotes and use it to illustrate any of the other modes and see what sense could be made of the quote. For example, the quote: *"…One didn't use the tools because of insecurity and fear…you're out on thin ice…that's the way I felt myself…"* was used to illustrate the nature of integrating and specializing. One of the points made was that, for people to feel comfortable and successful in using a QM tool, they probably had to be skilled in fusing or alternating between specializing and integrating modes. However, this quote can be used to make sense of any of the other modes. Hence, this paper, in line with Dahlbom (2002), is about designing a way of thinking rather than revealing some type of reality. Nevertheless, in line with Gummesson (1991), I founded the design on the access to reality (data) and a developed preunderstanding. The suggested modes of organizing have emerged as part of my own process of organizing and making sense. The fourteen concepts, describing the modes, can be seen as building blocks formed by going through a variety of patterns of modes, on the path towards the way of thinking developed in this paper.

Fourteen modes of organizing at FSAB

The fourteen modes of organizing were identified by finding characteristics and contrasts in how people were orientating and taking actions at FSAB. To address these modes can be one way of understanding the problem of naturalizing quality management. The study of FSAB followed a longitudinal logic, but the description and discussion here follow a thematic structure. Each mode is illustrated together with another mode in order to see the characteristics more clearly. The illustrations in pairs is thus not intended to suggest that people were in one or the other of these modes. This would be a much too simplified

view of the way that people were orientating and taking actions at FSAB. The illustrations direct attention to each mode separately, and to how the development could be interpreted by addressing each one of the modes. This is a rationalized view; in reality, people were naturally orientating and taking actions in a complex fusion of modes.

Each of the fourteen illustrated modes of organizing at FSAB points at a certain way of orientating and taking actions. In practice, there is a variety of specific modes within each of the fourteen suggested ones. People are thus not in "the" specializing mode of organizing, they are in "a" specializing mode. They are in one of several "specializing modes". We could also identify a wide variety of basic modes, such as being sad or happy, positive or negative, critical or naive, etc. We could also identify other modes like "innovation", "defensive", "offensive", etc. Hence, depending on our focus and preunderstanding, we could illustrate a variety of ways in which people are orientating and taking actions. This paper addresses a delimited set of modes, which I propose as relevant in understanding the problem of naturalizing quality management. One of the central themes, however, is to show how this way of addressing the development in a company can facilitate our development of understanding the problem of naturalizing quality management. As has been indicated, each situation, work group, department, problem etc. needs to be addressed locally. I propose, however, that the way of understanding developed in this paper can be beneficial in such local investigations.

In Figure 10, the fourteen modes are illustrated in terms of oval surfaces over a pattern. On the opposite side of each of the seven ovals are the two modes which are illustrated together below. The neat symmetry in Figure 10 is naturally, in practice, a mishmash of people orientating and taking actions in different ways. Hence, people are orientating and taking actions in different fusions of modes.

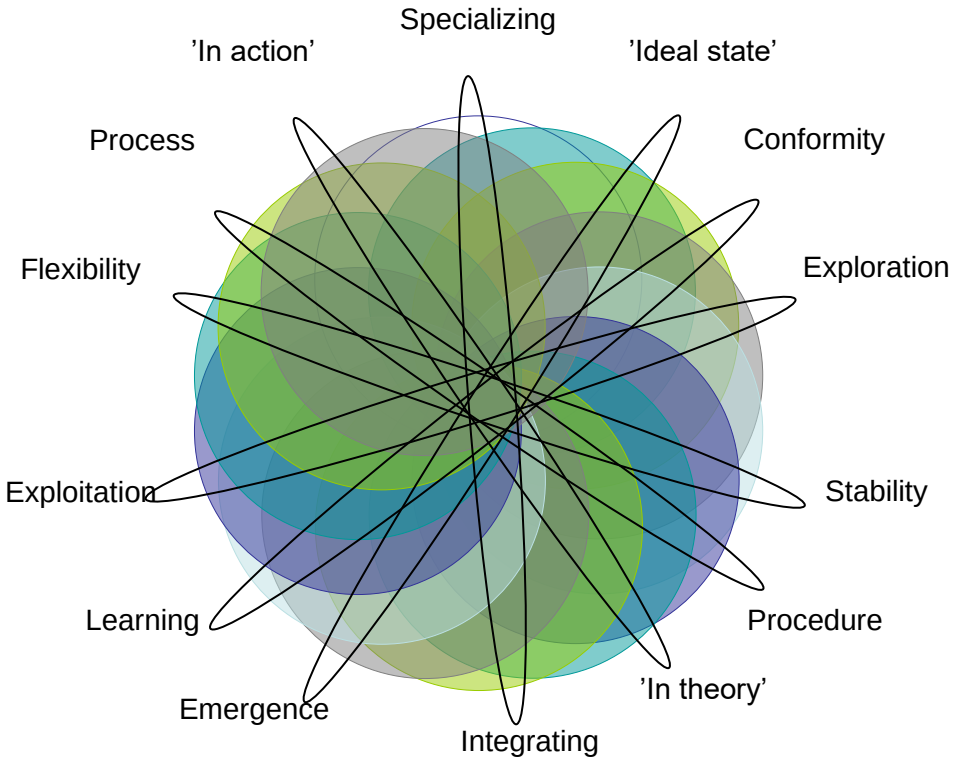

Figure 10 Fourteen modes of organizing

The terminology used may indicate a normative view of what happened at FSAB. It is therefore central to clarify again that the idea is not to describe observations or some type of reality in a more objective sense. The idea is to suggest one way of understanding. For practical reasons, the terms 'may, could, probably, tentatively, maybe, possibly' and other terms that could reduce the normative feeling are used sparingly in the illustrations of the modes, even though this is a tentative illustration and analysis.

Before going into the illustrations, it is essential to clarify that the modes of organizing are seen from a certain perspective of work. They are illustrated from the perspective that work "in action" was a matter of producing steel products and services within this industry. In addressing, for example, the Division of Quality Science at Chalmers University of Technology, the natures of the modes are quite different; e.g. to hold lectures, develop courses and write papers would be work in action. This is also relevant for a department at FSAB. What was work "in action" at the quality and development

department could be a matter of working "in theory" from an operator perspective. Hence, all the modes need to be recognized in a local sense, focusing on the specific situation or task.

Specializing and Integrating

The major divide between specializing and integrating modes of organizing was that in the former, people had a functional or single disciplinary orientation, while in the latter they were more cross-functional or multidisciplinary in their ways of organizing. Through specializing modes, people directed attention toward e.g. a specific technical knowledge, a specific method or a specific process. In integrating modes, they instead directed attention to e.g. how to combine the best multidisciplinary team for a complicated project, how to develop the knowledge about a system comprising several subsystems that were interconnected, or how to make a network of processes function well together.

People orientated in specializing modes directed at a variety of specialties. For example, as new production techniques were suggested by someone specializing in those techniques, this could have been met with scepticism in persons who were orientating towards their own core competence and specialty of knowledge. The following was said by a person at FSAB:

> *"…It is really tough in the rod mill…we have been working here as setters for 20 years, you shouldn't come here…"*

He was reflecting on the challenge of bringing in new ideas or making points about changes needed in production. A "setter" belonged to a group of "heroes" who knew the manufacturing process in the rod mill inside out. They were specialists who could often hear when something was wrong in the steel processing, and they were the ones who could save operations when problems occurred. The quote indicates their critical attitude, where people should not come and teach the specialists how to do a job that they had done for 20 years. The setters mainly orientated and took action in specializing modes that had been central in the development of their tacit knowledge. Their core competence was central to FSAB, but at the same time efforts were made to develop new ways of orientating and taking actions that were based on new principles, practices and techniques.

People at FSAB met diverse tools (methods) for orientating and taking action, e.g. tree diagrams, interrelationship graphs, affinity diagrams, Failure Mode and Effects Analysis (FMEA), Pareto diagrams, process flow diagrams. As part of a TQM program, they trained how to apply such QM tools for integrating qualitative data into a whole. However, they had trouble developing an intuitive feeling for the tools; they seemed to have problems in developing a sense of what was central while applying them. Furthermore, they had problems in integrating complementary QM tools into a whole. On a general level, they also seemed to have problems in integrating TQM and the ongoing daily work at FSAB. One person said that:

> *"…TQM and other work are regarded as two separate entities by managers…"*

The quote points at a common problem at FSAB. Several people perceived TQM as something rather superficial. Other persons perceived a gap in attention and priority between those specializing in TQM and those specializing in various operative roles in the company. People perceived a gap between the promotion and discussions about TQM and what actually took place in the operations. The competence in TQM tools initially became still another specialty to gain. In focusing on this specialty, people could develop a feeling for the tools and successively use them in an integrating manner in solving problems or planning projects. Over time, some people developed a capability of integrating different aspects into a whole, while using QM tools to organize and make sense of a situation or a problem. However, some people never seemed to gain the new specialty in using tools for analysis and development.

'Ideal state' and Emergence

The main divide between 'ideal state' and emergence modes was that in the former modes, people directed attention to a vision of the future or a "model", while in the latter they directed attention to work here and now as part of an evolutionary or emerging development. In 'ideal state' modes, they directed attention to concepts such as TQM or ISO 9000, describing criteria and requirements for good functioning. This could be a matter of working out a strategy, oriented at a vision of the future, which could comprise how people in the organization would behave in the future. People aimed for the future, in terms of describing an 'ideal state', promoting it and working towards it. When they, on the other hand, were orientating and taking actions in emergence modes, they directed

attention to the development leading to a certain situation or activity, and the factors constraining or facilitating development. This could in practice be a matter of solving a specific problem, or working in a process of continuous improvement. People in emergence modes could be making sense of ideas formed in 'ideal state' modes; and they could be working out how to act on these ideas in order to gain improvements. They focused on how to stimulate organic growth from the inside, but in relation to external ideas or promoted 'ideal states'. One example we can trace in the following statement:

> *"... Now we have a grip on this material yield problem area…now we have figures, now we have facts, so now we have thrown out this resulphurized material, after running it for five years with low material yield, without anyone reacting to the fact that we didn't make any money on this…"*

At FSAB the efforts to produce a specific steel-grade – "Resulphurized steel, AISI 303" – exemplifies the divide and interdependence between the two modes. There are thousands of different steel-grades; the grade that FSAB tried to produce offered opportunities on a market toward which FSAB was striving to become successful. Some managers viewed the steel grade as a missing link in the product portfolio. However, this grade was problematic to produce, and people never solved the problems. Managers who orientated and took actions in a certain "ideal state" mode were addressing a vision of being capable of producing and providing customers with the steel grade.

Specialists and other production personnel also addressed the vision, but they also tried to solve the steel-grade related production problems. They took part in ongoing problem-solving and recurrent dialogues with experts, customers and other stakeholders. As they were addressing the vision in relation to the current situation and their experiences from the past, they were orientating in an emergence mode of organizing. People who were driving towards a certain ideas, visions, and innovative thoughts could contribute with a positive force, but they could also hinder people who were orientating and taking actions in other modes. For example, the top managers could see new and innovative solutions to certain problems, but technicians and other production-oriented staff could have a diverging view and other logic in making sense of the ideas.

Looking at the explicit QM development, as FSAB anticipated requirements from customers in the form of ISO 9000:1987 they planned for the anticipated requirements in good time before the final requirements came in 1987. The same approach could be seen

when the quality and development department met the QS-9000 requirements a decade later. From a QM perspective, keeping track of, and acting on, the emergence of QM concepts and requirements took place through emergence modes. The diffusion of new QM concepts and requirements was part of the context that the QM staff attended to on an ordinary basis. This was a matter of handling exogenous forces in terms of outside requirements and the promotion of "new" concepts; and at the same time QM was about coping with endogenous forces. Such endogenous forces were growing from inside in terms of scepticism, criticism and cynicism, towards management in general and more specifically also towards QM activities that were going on.

In the terminology of this paper, most FSAB staff would probably infer that people who managed QM were orientating and taking actions within 'ideal state' modes. On the other hand, those who were leading change through QM could view their work as being a matter of orientating and taking actions in emergence modes, looking for continuous improvement. The rhetoric often represented a search for a new way of working that should grow in the company. In practice, however, people often directed their attention to, for example, TQM as described in presentations, texts etc. One person expressed this as:

> *"…You make a model and then you think that it will fit everyone in every place…maybe that's the case with TQM too, the whole concept may be good but you have to adapt it and work out your way of doing it…"*

The quote comes from a reflection on the need for people to have the ambidextrous capability of orientating and taking actions in 'ideal state' and emergence modes at the same time. Even though the design of TQM at FSAB stressed the importance of adaptation and emergence, many people were, in practice, orientating and taking actions in 'ideal state' modes. Hence, the TQM development initially, was rather static and slow, focusing mainly on an ideal state rhetoric. Furthermore, while the TQM advisor stressed the importance of adaptation, the managers did no attend to central prior events in the history of FSAB. One person exemplifies this by referring to the feelings of several employees:

"…There was one-way communication regarding what TQM was…that we are going to bring this into our company culture…it was met by enormous scepticism. What is this that you are going to start now? …goddamn campaign…you have to remember there had been a similar thing that ended in 1992 [checking facts showed that it was actually during the end of 1990 that the ending started] with the notices…it's like this: if you do a campaign and the outcome isn't good it's hard to come with something new later, because then people will think that this is some new shit that you have made up…there's something like a fashion in these kind of things…now we have to be on this train…people came to me and asked why I was working for this and I had to explain my perspective… some probably thought I was bought by [the quality and development manager]…"

The reflecting person points at the variation in people's perspectives, and how the history and their role influenced their way of orientating. The person also pointed at the context of FSAB, where people made connections with prior experiences of, for example, disrupted improvement efforts. The clearest example of such disruption related to what people labelled the "Future Project". The project concentrated on four identified fundamental principles: basic values, long-term direction, goal, and mission statement. The goal of the project was that every employee was to develop an awareness of these principles and their implications for their work. Everyone was to be involved in designing prioritized development projects, but financial problems disrupted these plans.

Approximately a year after the start of the Future Project, the president announced a staff reduction of close to 40 %. This was in 1990, and it had a critical impact in 1996 on the subsequent TQM initiative. People were addressing prior experiences, guiding their understanding of what TQM was about and how it would end. Their views, in the terminology of modes, were that the TQM ideas were 'ideal states' sought for, but these attempts were likely to be disrupted or abandoned. A common perception was that this was mainly a matter of theorizing, while, in practice the staff anticipated no "real" changes. Many persons had been working at FSAB for decades; and as they orientated in the emergence mode, they anticipated minor changes resulting from TQM.

Conformity and Learning

The main divide between conformity and learning modes was that in the former, people directed attention to conformance or being legitimate, while in the latter they directed attention to the learning process as such. In conformity modes people directed attention to

making other persons accepting a way of thinking and acting, or they orientated and took actions only to conform. Such modes could thus dominate, as people did not quite believe in a vision or goal, but they still acted to conform with ideas, rules, objectives, visions, regulations or models produced in 'ideal state' modes. The focus was on conformance rather than to achieve a vision of the future; and it could be the effect of higher-ranked managers orientating and taking action in 'ideal state' modes. People tried to conform as well as they could in order to be legitimate in their behaviour and work. However, to orientate and take actions in conformity modes could cause resistance in learning modes. In learning modes people directed attention to developing knowledge and competence in order to improve the capability of oneself and the organization. Learning modes directed attention to what could hinder or stimulate learning; and a dominating conformity focus could constitute a threat.

During a period between 1996 and 2000, when a TQM concept was dominating, people were discussing ways of learning and developing the company, and also the amount of activities that were going on. For some individuals who were involved in many central projects at the same time, the situation became rather stressful. Some tasks needed to be consciously prioritized only to conform, while other tasks were addressed while orientating and taking action in learning modes. People, due to the flora of ideas and projects, felt that it was problematic to learn and gain results from the work during the TQM period 1997-2000. One person expressed that:

> *"…Many thought that we were doing too much at the same time…"*

This person reflected on the substantial amount of projects and activities going on. People felt that they had too little time to digest and learn in a good rhythm of development. This could cause them to go into conformity modes; and those who orientated and took actions in conformity modes did not strive for a vision of the future, or towards an objective. Instead, they became rather defensive in this type of mode. Sometimes, they could perceive that striving for conformance could hinder learning. One person expressed regarding the initial ISO 9002 work that:

> *"…ISO was so heavy/sturdy…the papers were more important than how we worked…"*

The same person expressing that ISO was “heavy” also expressed that the work had been valuable; the ISO 9000 inspired development at FSAB in his perspective had contributed to a beneficial structure and systematic work. He assessed the manufacturing instructions in the rod mill to be inestimable, in the work with the great variety of steel grades. The two diverse opinions point to one individual’s ways of orientating in two modes of organizing. Depending on which mode of organizing the person orientated in, the same working-out procedure etc. was seen as resulting in valuable contributions or in disturbances. Procedure-oriented work could facilitate work, but it could also disturb the more process-oriented work that was adding value in production. In a fusion of these modes, both ways of orientating would be integrated in the assessment of a situation or of the value of a certain procedure.

As requirements or concepts influenced people to orientate in conformity modes, this could successively lead people to learn new ways of orientating and taking actions. Nevertheless, as people related to their perception of what was central in the development, some viewed the ISO 9002 driven development as diverging from what they considered value-adding work. People were mainly orientating and taking action in conformity modes as they developed the QM system of the organization. However, over time this seemed to change. A person pointed out this change:

> *“…In the beginning one did things to satisfy Lloyds…but then one got used to the way of working as one had taken in the attitude…”*

This person reflected on people’s tendency to focus initially on conforming with the requirements of ISO 9002 and QS-9000, as expressed by the quality auditors. He pointed out a dominating conformity mode. Over time, however, he has observed that after getting used to a certain way of working this could stimulate people to successively learn new ways of orientating and taking actions. Thus, people who orientated in conformity modes had a tendency to get used to addressing quality systems requirements and creating value from it. They could be fused conformity and learning modes; however, this could also be a symptom of a tendency to get used to orientating and taking actions in conformity modes.

Conformity modes could catalyze new and more efficient processes emerging over time, but could also induce scepticism and hindrances in the current work. Furthermore, depending on the situation, people orientated differently, and one person expressed this in a rather frustrated tone:

> *"…At meetings we were talking about the way we were working…then we came out to the job and had a shitty way of working…"*

This person was reflecting on his own and others' work toward a vision of total TQM. In his perspective, as people were communicating about TQM they constructed a rather positive view on the development during meetings, but the communication was adapted to what was perceived as being the intentions of TQM. In practice, outside the gatherings, and outside 'in theory' modes, people were not acting in the way described during gatherings. The person perceived that people, in practice, did not behave as they described during gatherings.

Exploration and Exploitation

The main divide between exploration and exploitation modes was that in the former, people searched for external opportunities or solutions, while the latter they sought to gain value in already existing ideas, methods, or techniques; these could be used as tools in the development. In the former mode, people were exploring new ideas, methods, and techniques while in the second they were looking to gain as much value as possible from already familiar ones. Hence, by exploring new QM tools, people could incorporate and exploit the ones that they found most relevant or interesting. The search for a new approach to develop FSAB, which led to an initiation of a TQM training program in the middle of the 1990s, was a matter of orientating and taking action in exploration modes. The sense was that something new was needed, something that could aid a transformation from an existing company culture into a new one. An alternative could have been to go back and investigate opportunities resting in the ideas within, for example, the future project which was abruptly stopped in the beginning of the 1990s. To fuse or alternate exploration and exploitation modes was a delicate matter.

Some employees became rather fatigued by the effort to incorporate new ideas, requirements or opportunities coming from outside. They sensed that they did not have the time and resources to gain value from what had already been started; and still new

outside influences kept coming. One example was the start of QS-9000 and the implications of these requirements. The idea was to use the QS-9000 project to induce energy into rather faltering TQM activities. In the beginning, however, this was perceived to be still a number of new requirements and ideas from outside; and the existing TQM ideas had still not been digested. The work towards a QS-9000 certification exploited TQM in relation to the existing ISO 9002-based QM system. All three QM concepts carried outside influences into the company, but in the case of QS-9000 the incorporation was also directed at exploiting the already incorporated ideas from the prior two concepts. To gain value from the outside, influences took endurance and patience. Many persons were critical and sceptical. Still, people expressed that influences from outside were beneficial; one person expressed this in a reflection on TQM:

> *"…We have to get influences from outside. I mean that we have to get influences from other businesses where they have been part of something similar that we are going into and that can give us references to different stuff."*

The quotation is from a dialogue concerning the wide flora of outside ideas and examples of QM tools applied by companies like Xerox and ABB. These QM tools were introduced in the TQM training program. People with first-hand experience from other companies were brought in as consultants and trainers. They presented how things could work in modern quality-oriented work and a number of QM tools – e.g. QFD, affinity diagram, relationship diagram, tree diagram, success tree, change approaches – to stimulate this kind of work. However, there was a gap between a positive perception of the tools and exploitation of the same. In practice, many persons stumbled in the development and the progress was slow. The above quotation nuances the critical view on how TQM had been introduced. It was not that ideas from outside should not influence the FSAB development; rather it was a matter of timing the outside influences with internal measures. One person discussing what was important in the development commented on a central aspect directing attention to the importance of fusing or alternating exploration and exploitation; he referred to the job of an employee who was involved in the outsourced maintenance work:

"…He had some background information that they perhaps had not thought about so that he could come somewhat from underneath…he got them to engage and care…there were constructive discussions…"

The employee was involved in FSAB's Total Productive Maintenance (TPM) work and he collected data from the manufacturing process before having a dialogue with the operators. By exploiting the information available in the manufacturing process he could stimulate a dialogue concerning what measures could be taken to improve the capability. The operators, according to the reflecting person, became involved and engaged in exploiting opportunities for improvements. The starting point in these exploitations, however, was the exploration of new maintenance techniques. New software and new procedures for maintenance were developed via the introduction of TPM. Successively this work grew into a situation where more qualified data were available and the opportunities for the type of dialogue referred to emerged. The person referred to in the quote could take the role of connecting exploration with exploitation of internal problems and opportunities. Other persons had previously had this role in the maintenance, but without the software. This movement from a dominating exploration mode toward a fusion or alternation of exploration and exploitation was emerging in the TQM work. However, as the TQM initiative was closed by a new president, few persons facilitated this development. One person expressed this:

"…Since there is no formal person in the company driving these issues now, it is a bit up to each and everyone to drive this, and it's a little pity…it was you two who brought it to the agenda and who were out and questioned etc.; that's not the way it is today… We were probably on the way [towards something good]; now these types of issues are very seldom brought forward…"

The quote indicates that when no one had the role of persistently stimulating exploitation of TQM the progress stopped, at least for those who had not naturalized the QM tools in their regular way of working; and those were many. People had a sense that something was starting to grow after a long period of searching and planning for new ways of working. This growth took place during the exploitation of the "imported" QM tools

while people were adapting and integrating the overall intentions in TQM into their own way of organizing.

Stability and Flexibility

The major divide between stability and flexibility modes of organizing was that in the former, people directed attention to avoiding threats and forming stable foundations based on core competencies, while in the latter they emphasized how to be open to opportunities or new ways of working. In stability modes people were orientating and taking actions to gain a sense of being in control, and in flexibility modes people could challenge stable structures, or focus on having flexibility in coping with any situation or event. Hence, to orientate in flexibility modes could be a way of gaining stability. In this sense, the two modes could be intertwining.

We can exemplify the two modes by interpreting the efforts to make people at FSAB apply QM tools, which could facilitate investigations. During many dialogues on the QM efforts at FSAB, people emphasized the importance of using the tools. And still, for some reason, it was problematic for most of them to make the tools part of their natural ways of orientating and taking action. For some reasons people were drawn back to a type of stable way of organizing which they were used to. Some people, however, could break the "habits" and bring in the QM tools as part of new habits of organizing. One person reflected on what was central in promoting people to use new QM tools:

> *"…it is this combination of pushing, supporting, pushing, supporting…it is very individual how much supporting and pushing is needed…"*

The person talked about the problem of developing a new way of working even if it was clear that it could be beneficial. "Pushing" was a matter of stimulating people into orientating and taking actions in flexibility modes so that they started to use the tools, and "supporting" was a matter of facilitating their sense of stability as they were trying to integrate the tools into their ways of orientating and taking actions. Some people needed to be pushed in order to orientate and take actions in a more flexible manner, or in a fusion of flexibility and stability modes of organizing. Managers promoted selected QM tools, but it was troublesome to make them a natural choice in the daily work, even for some of the managers who promoted them.

To go from a former sense of stability into another mode of stability partly based on the QM tools required flexibility. This flexibility could be natural for some individuals and less natural for others. To stimulate the application of QM tools, the reflecting person meant that people needed varying degrees of pushing and supporting. That is, they needed varying degrees of facilitation through stability and flexibility modes. The person also pointed at the importance of good timing and rhythm in pushing and supporting.

The timing and combination of pushing and supporting were probably central for the progress of TQM. In reference to the history of FSAB, people were sceptical about new initiatives. During a period they had even been unsure whether the FSAB operations would survive at all; and during such a period, the focus was not on applying new QM tools for development. On the other hand, some people (from the "old school") had the attitude that the FSAB operations would persist much longer than the ideas of TQM; the operations had a history going several hundred years back in time. Whether people believed in the latter scenario or in the former where FSAB was threatened, they were in these cases orientating in stability modes of organizing, however different. These types of stability modes could dominate people. In the case of feeling threatened, their history, comprising several phases of major restructuring, had induced a sense of insecurity among people, as the 1990s were coming closer. One person expressed that the decisions on an investment program in the rod mill during the mid-1980s provided an important signal that the operations would survive. It gave a sense of basic stability, or as the person expressed it:

> *"There was an investment decision during this period regarding Rod Mill 90 [in 1987 and after many years of reconstruction and staff reductions] then people probably got back some belief in the future…if one invests so much, one cannot close the Mill, can they?…"*

During the 1970s and 1980s the steel industry in Sweden in general, and the Fagersta operations specifically, were heavily restructured. FSAB was formed in 1984 from the rests of a restructure of Fagersta AB. The quote refers to a reflection on a general feeling among many persons at FSAB during the middle of the 1980s. After many restructures, people lost their sense of security, which gave a tendency to orientate in stability modes. Depending on the mode in which people orientated, the restructures or investments could be seen as being part of gaining stability or flexibility, stability for flexibility, or flexibility for flexibility. The same was naturally the case for prior restructures. Anyhow,

it is not hard to see that in relation to the restructures, the parallel activities driving towards an ISO 9002 certificate did not gain that much interest. However, the work successively led to a QM system forming a rather defensive, but stable, quality management approach.

In the beginning of the 1990s, after the investment program, the operations had a new technical platform for further development. This gave stability and offered a situation when other, less production-oriented, development gained attention. The QM development became a central and strategic issue during the middle of the 1990s, ten years after the ISO 9002 work started, in addressing drafts and anticipated requirements from customers. The top managers felt that they needed to promote and develop a more modern way of working to stay competitive. To develop the company, they sought a more holistic and overall approach to strengthen the capability of the company. These efforts started with a TQM program, and one person, reflecting on the development, commented the QM work over the years:

> *"…it is ISO, TQM and QS [QS-9000] together that probably have done quite a bit…it takes endurance…if one were to go to the Japanese who are supposed to be so good, what are they talking about, well, they talk in terms of 10-year periods…"*

The focus on "endurance" was also a matter of orientating and taking action in stability modes, which directed attention to gaining stable and robust development. The person expressed that it was quite natural that it had taken time to gain benefits from the investments in quality management. Gradually and with endurance, the capability of the company had evolved, and this was quite natural.

Procedure and Process

The major divide between procedure and process modes of organizing was that in the former, people directed attention to mapping and describing processes, and prescribing procedures, while in the latter, they directed immediate attention to processes. In the latter mode, they were directly attending to the flows of activities, material and information, and to the way that they were functioning together. In procedure modes they were drawing maps and addressing procedures that could facilitate the processes, then in conformity modes people were to follow these procedures. Process modes directed

attention to the actual processes, not on descriptions of the same or on plans for the future; the latter would be part of orientating and taking actions in other modes. The central theme in both modes was to address the flow and interaction of different activities and technical processes. It was also to recognize the interaction and dynamics in and between flows, in order to orientate and take action to positively influence the whole; e.g. product development activities, complaints handling, production of wire, production of wire rod, human resource development were addressed in terms of being processes in a larger system creating value for stakeholders. In a process view, these stakeholders are all seen as customers with different aims and needs which are addressed in the system of interrelated business processes.

In process modes, people addressed the flows and the dynamics, focusing on satisfying the needs of stakeholders, including customers, employees, owners, suppliers, bankers, unions, partners and society (the latter list of stakeholders is from the definition of "interested parties" in ISO 9000:2000). They addressed flows and rhythms of activities, with a focus on how all types of activities could contribute to the best of the whole organization seen as a system of activities. Facilitating routines could be designed in procedure modes to specify certain ways of carrying out activities. Visions and goals could be used as inputs to both procedure and process modes; however, depending on the mode of organizing in which they were orientating – procedure or process – their objectives differed and their actions differed. One person, who was involved in the development of the ISO 9002 guided QM system, commented:

> *"…One did not get much support from the organization to bring in ISO…2-3 persons worked with the system and the secretary wrote a lot… It felt like there was great focus on the quality system among those who worked it out…instructions and such things have always been part of production…but we did not talk in terms of processes then…one did not use that terminology…"*

This person was reflecting on the project to gain an ISO 9002 certificate and on the process terminology introduced in the latter QM work. The few persons who were involved in developing the ISO 9002 inspired QM system in the end of the 1980s and the beginning of the 1990s were mainly orientating and taking actions in procedure modes. The majority of the people taking part in, and developing, processes were not involved in the ISO 9002 project. Moreover, those who were addressing processes addressed mainly

the production and not the system of interrelated activities of various natures – i.e. production, management, logistics, human resources, engineering, etc. The focus was not on understanding the organization as a whole in terms of processes; it was on the traditional production processes in a steel industry. As part of a TQM program, however, consultants and researchers promoted a more conscious focus on business processes in terms of a system of interrelated activities.

The TQM initiative, starting in the middle of the 1990s, encouraged people to orientate and take action in process modes. Hence, a process terminology emerged. A Swedish subsidiary to a US firm of consultants trained FSAB participants and facilitated a process improvement project. To start with, a group of employees identified and analyzed three central processes in a systematic approach, following the consultancy firm's procedures. The following is a quote from one of the reports:

> *"…FSAB has during the spring of 1997, together with [a firm of consultants], developed a change plan. This work was conducted with basically the same cross-functional team complemented with [the quality and development manager] who during the autumn of 1996 analyzed and designed the offering-, order- and production processes together with [a firm of consultants]. …The change plan contains eight focused change areas… After implemented changes the achievements of the following results are estimated to be facilitated:*
>
> - *Increased turnover from 1300 MSEK 1996 to 3400 MSEK year 2000…*
> - *Increased world market shares…*
> - *Marginal increase of personnel from 1997 to year 2000 …*
> - *Strong increase of the result*

The facilitating consultants were stimulating a process-oriented development at FSAB. However, they did not themselves orientate and take actions in a process-oriented way. They did not adapt to the circumstances and dynamics in the ongoing TQM work. Instead, they were oriented towards the procedures set up in their own consultancy firm. Hence, in a way, we can see the intended process-oriented work as founded on procedures, which may have blocked the consultants' ability to adapt and organize in a

process mode. Because of their inability to adapt to the circumstances to the local conditions and the development going on, top managers at FSAB stopped the process improvement project. The consultants founded their facilitation on a comprehensive approach created by the US parent company, which came in conflict with the QS-9000 project and with the overall TQM approach. FSAB did not even get close to the goals defined above.

'In theory' and 'In action'

The main divide between 'in theory' and 'in action' modes of organizing was that in the former, people focused on discussing, reflecting, reading, and writing about a certain problem, process or task, while in the latter they were oriented towards concrete measures. People in "in theory" modes could discuss and reflect on the meaning of, for example, TQM and how to design a plan for developing a new company culture, and ways of handling work. Hence, those who orientated and took actions in 'in theory' modes did not get concrete work done, which materialized results for stakeholders. They were often in stark contrast with those who normally orientated and took actions in 'in action' modes. In such modes people were getting work done, here and now influencing the value received by stakeholders. Hence, they were realizing concrete measures on outputs from people, possibly including themselves, who had been orientating and taking action in other modes. They also produced inputs to those who entered or were in other modes of organizing, since the actions within the "in action" modes produced tangible results.

In a conscious learning process, 'in action' modes could be fused with learning and emergence modes. They could enter fusions of modes of organizing, together with others, in which they took actions and reflected on their actions and the context of their actions. People could also reflect together, during meetings that were focused on discussing the current status of production or how the production could be improved. Such meetings would be run through 'in theory' modes which did not produce any explicit value, although the effect could be greater awareness and preparation for action.

To run meetings which were explicitly directed at promoting people to reflect on their work did not mean that everyone who participated was able to orientate and take actions in "in theory" modes. Several persons were unable to go from their ordinary, rather practical work into a way of organizing where they should produce another kind of value. One person indicated this in a reflection:

"…You have to run short meetings; these fellows are not used to sitting still…"

This person was reflecting on the efforts to involve operators in the production in systematic improvement work. He had observed that one central factor was to run short meetings, otherwise several operators started to feel uncomfortable. As long as the contents of the meetings were clearly relevant for their work in action, it was okay. However, the participants were to orientate and take actions in 'in theory' modes those who mainly orientated in action, were tired and sceptical. Short meetings, the reflecting person meant, were more efficient and effective. The best would perhaps be to fuse 'in theory' modes with other modes of organizing. Nevertheless, leaders often orientated and took action in 'in theory' modes without influencing the practical work. It was a challenge to connect 'in theory' and 'in action' modes in an efficient and effective way, e.g. in the application of the QM tools. One person reflecting on the fragmented application of the tools expressed in frustrated tones that:

"…all these tools we were to use…I was at so many meetings and I can tell you that we bloody well did not use the tools…"

Consultants trained FSAB employees in how to use certain QM tools via 'in theory' organizing, focusing on how they could function in practice. However, the fusion of 'in theory' modes and other modes, where the tools were actually applied in practice and closely related to the more practical work, was problematic. Consultants taught a group of employees in a selection of tools for analysis and they were to facilitate the systematic use of these. Those who took part in practising the tools most often thought that they were good and had potential. Nevertheless the QM tools got a type of 'in theory' stamp on them. Instead of becoming part of a process of adding value, mixing 'in theory' and other modes – in particular 'in action' modes – the following reflection by one person indicates the tendency at FSAB:

"…One put on one suit at the conferences and then, on with the "overalls" in between the meetings…but one should have worked more actively between the meetings …"

This person was reflecting on how people in managerial roles were adapting their way of orientating, depending on the situation. At meetings concerning TQM and its development, managers put on a suit and orientated in a way that was not aligned with the

ordinary business; ‘in theory’ modes were dominating. After a conference or between meetings or “training camps” people put on their “overalls”, which meant that they “forgot” much of what they had been discussing during meetings or practised during training camps. Hence, while they were orientating in ‘in theory’ modes during meetings and conferences one way of reasoning was dominating, where TQM was beneficial and good for the organization; however, in the practical and daily work, the developed plans and the suggested QM tools were not systematically and actively used to solve problems ‘in action’.

Understanding the problem of naturalizing QM

Fourteen modes of organizing – specializing and integrating, ‘in theory’ and ‘in action’, ‘ideal state’ and emergence, exploration and exploitation, procedure and process, conformity and learning, stability and flexibility – have been illustrated. This paper suggests that people at FSAB – top managers, middle managers, engineers, office staff, operators and consultants – were orientating and taking actions in various modes. It is not possible to identify exactly in which modes a person or group orientated and took actions, and that should not be the purpose of addressing the variation in people’s ways of working. The idea is to develop a shared understanding, or mental model (Senge, 1991), and a way of understanding in communicating about the problem of naturalizing principles, practices and techniques. If we can communicate about it, we can also develop our understanding of the problem.

This section will discuss possible patterns in the way that people at FSAB were orientating and taking actions. The aim of discussing these patterns is to illustrate the different ways in which people may orientate and take actions. The aim is thus not to describe the “actual” patterns of organizing at FSAB; these may be interpreted in many ways. The examples used below should not be seen as a normative assessment of how people were orientating and taking actions at FSAB. They are examples of how we can discuss the way in which they/we are e.g. going into and making sense of a course, addressing a new requirement, communicating and recognizing visions of the future.

People at FSAB were more or less specializing in their core competence, and they integrated new ways of working or tools for development. They were setting up implicit or explicit goals and visions of the future, and they did this in reference to the emergence in various processes and their experiences – they did it in reference to their current understanding. Some people also took part in developing procedures that could support processes and their developments. People tried to conform and they learned new ways of orientating and taking actions, through e.g. the exploration and exploitation of principles,

practices and techniques. They were searching for stability in terms of e.g. gaining competence, learning their job, and keeping their job, and they were more or less flexible in e.g. finding better ways of working, complementing with new areas of competence and being open to others' suggestions. Hence, people were all, more or less, now and then, orientating and taking actions in different modes of organizing or different fusions of modes.

I use the term 'fusion' to address the mix of modes in which we are orientating and taking actions. One could express this fusion in terms of junctions, mergers, mixes, combinations or overlapping modes. However, the term 'fusion' is used here in a metaphorical sense, by thinking about "fusion energy" in which atoms are fused into new structure or pattern. The nature of the atoms is changing. I am also thinking about the "fusion of companies" as I metaphorically think about the fusion of modes. Thus I want to illustrate that the fusion of modes yields a certain pattern in organizing which is a mix of modes, but the novelty is something more than only a combination of modes. People at FSAB naturally had more or less strong tendencies to be in a certain mode of organizing, e.g. conformity or ideal state, but in a general sense the pattern of their work was more complex. They orientated and took actions in a fusion of modes, or alternated more frequently between different modes, or they could be alternating between fusions of modes.

For example, a man – a top manager, a middle manager, and engineer, one of the office staff, or an operator – taking part in a course, focusing on a practice of doing affinity analyses of problems, goes to the course in one of several possible fusions of modes. Depending on the man's preunderstanding and intentions in going to the course in the first place, he could go there in an initial mode of either conformity or learning. Hence, the focus could be on legitimacy, in the case of not being there by "free" will, and even feeling an internal scepticism towards the course. On the other hand, the focus could be on learning something new and on how to learn this new practice. In the former case a conformity mode could be in a fusion with e.g. a specializing and a stability mode of organizing. This could result in a pattern of orientating and taking actions where the man was sceptical or cynical; he could also feel threatened in an awkward situation. He did what he was told or what certain requirements demanded. He went to the course, but being there, he viewed the contents through the lens of his own already developed expertise, where he felt a stability in his competence. He was viewing the contents of the course in terms of his own specialty of knowledge, and not through an integrating mode of organizing, trying to see how this could be used in combination with his already developed skills. In the case of going there by free will, coming from an interest in learning the new practice, the fusion of modes would be quite different.

Naturally, this is a rationalized example which could be further elaborated, but the point is that individuals at FSAB were in various situations of orientating and taking actions in different ways. They orientated and took actions in various ways in their daily work, and as they were meeting new principles, practices and techniques. This is quite obvious and we all know that it is a reality. The question, however, is how we can address this phenomenon. How can we recognize it and do something about it? How can we understand the consequences and communicate about it? The present paper suggests that by addressing this phenomenon and others, where people are orientating in varying ways, we can also develop an understanding of the questions posed above. We can start to learn more about the way that e.g. a person, a group, a department, a project group, a management group or a company is functioning. We can develop our understanding of the problem of naturalizing principles, practices and techniques, and we can do this by learning how to identify fusions of modes in which people are orientating and taking actions.

By recognizing and analyzing quality management in an organization, and addressing the suggested modes, we can, with the aid of our preunderstanding, develop an understanding of the problem of naturalizing QM. The illustrated modes are naturally a delimited selection among a variety of modes, which can be identified depending on the purpose of the investigation. In this paper we are focusing on the quality management development in a company, FSAB. We could have investigated a specific group or department; we could also have addressed a specific practice. The central theme in this paper is, however, on understanding the problem of naturalizing QM in a more general sense. The focus is on developing a "language" that can be used in communicating and analyzing the problem of naturalizing QM. The modes of organizing suggested above can be seen as part of a "grammar" which can influence our way of communicating. With the aid of this "grammar" we can address the development at FSAB.

In using the term grammar, I am referring to Weick's (1979) definition of organizing "a consensually validated grammar for reducing equivocality by means of interlocked behaviors". At first glance this definition may confuse more than it contributes, but if we look at the meaning, as I interpret it, this is a matter of having a common understanding and way of orientating and taking actions in a certain situations. It involves sharing mental models of how we jointly address certain tasks, situations or events. In having these shared views we are reducing "equivocality" or "ambiguity". To have a shared understanding of what an author like Weick means can thus influence this "consensually validated grammar". A consensually validated grammar is referred to in ways similar to how Senge (1990) uses the term 'mental model'. Ingrained assumptions and views on how things work, or the patterns of organizing, constitute our view of reality. Consensual

validation means here that for some reason our senses, influenced by our ingrained assumptions, rules, values, etc., tell us that this is a natural way of viewing a situation or problem. We are not, however, achieving this by talking in Weick's language in "real world" situations when we try to orientate and taking actions. Hence, we should not start to communicate in a type of "meta-language" of organizing, but we can develop understanding in how people are orientating and taking actions. We can develop our mental models and consensually validated grammar.

With the aid of the "grammar" of modes we can create alternative explanations of why a certain principle, practice or technique does or does not become natural. We cannot find the "truth", but we can communicate and create views that can further our understanding. In the case of FSAB we could analyze the development on different levels of organizing. We can analyze the interactions with certain consultants, or we could analyze specific projects, e.g. the QS-9000 project going on at FSAB during the late 1990s. Looking at the development over time, we can also investigate what patterns in the organization influence the development, and in what way. By addressing these patterns we can develop our understanding of the problem of naturalizing quality management. Naturally, these will be our constructions of patterns, but if we can develop shared mental models of the past, of the current situation and of what we want in the future, they may be beneficial for action. These shared mental models may have an impact on our capability of orientating and taking actions together.

People at FSAB were orientating and taking actions in a flux of e.g. ideas, management models, problems, opportunities, coming and going managers and staff, coming and going consultants, and requirements. They did so in varying fusions of modes, and they alternated more or less unconsciously between different fusions. I find that, through all these ways of orientating and taking actions, complex patterns emerged. These patterns can be addressed by using the "grammar" of modes that has been suggested in this paper. We can analyze different levels of organizing in a company, in which we have patterns within larger patterns of orientating and taking actions. Depending on how people in the board of directors, top managers, engineers, operators, etc. orientate and take actions, they are jointly forming patterns of organizing that have mutual influences. Hence, patterns on different levels are creating new patterns etc. and, through these processes of changing patterns of organizing, certain dynamics or rhythms of development may emerge.

On a higher level of organizing, new international requirements driving e.g. environmental demands, financial control demands, and product characteristic requirements are influencing the patterns. Companies are restructured or they are part of

company fusions; they go into financial crises or they move their operations. In all of this, top managers are orientating and taking actions in a way that influences sub-patterns of the development. In these sub-patterns people within a company may be involved in developing a quality management system; they may be involved in promoting a certain method, or they may be involved in a TQM initiative. On yet another level, people may work in a group to solve a specific problem in the production, or they may develop a new procedure that aims to facilitate the recruitment of new employees. Then, on an individual level, top managers, middle managers, office staff, engineers, operators and consultants are orientating and taking actions in their own unique fusion of modes. They are involved in multiple processes of development within the organization and outside in their personal life. They bring their unique preunderstanding into the variety of situations and tasks that they attend.

People at FSAB were specializing in their core competence and their area of responsibility, which had been the case for decades, even centuries, of development. The company had only existed since 1984, but the operations had a long history as part of Fagersta AB's development. Via the development of quality management during the 1980s and 1990s, the demand for a new specialty emerged. This specialty was a matter of understanding and developing companies, where people addressed their work as part of a system of interrelated processes. A new "profession" emerged on an international level, with "QM specialists" who focused on principles, practices and techniques for addressing the organization in terms of a system constituted by interrelated processes. The QM specialists gradually developed a series of requirements with which companies were to comply in order to be legitimate. A conformity focus was developing on an international level, and this tendency influenced companies like FSAB.

At FSAB, the international development influenced top managers. They felt that they needed QM specialists, who could develop competence in QM principles, practices and techniques. These people could then drive the development at FSAB to conform to requirements, coming from the outside via customers. Formally, the development department was transformed into a quality and development department in the formation of FSAB. As the ISO 9000 requirements were evolving and spreading during the mid-1980s and later, people in this department were focusing on conforming with a variety of formal quality assurance requirements. People were involved in developing procedures and documents that aimed for structured and systematic quality-oriented work. Then, during the beginning of the 1990s, a feeling grew that the ISO 9000 work was not enough. The top managers felt that they needed a new type of competence that "successful" companies were using to develop their operations.

A flora of ideas emerged within and outside the field of QM. These ideas were spreading to FSAB via consultants, visits at customers, research, and formal requirements within, for example, ISO 9000. The latter requirements were promoted both by customers, through for example supplier audits, and by consultancy firms selling a variety of services – education, certification, coaching, etc. The auditors focused on understanding formal requirements, which were recurrently changing and facilitating companies like FSAB in conforming to these requirements. In parallel with the development of successively revised formal requirements, consultants and researchers developed and promoted a variety of principles, practices and techniques. Sometimes the consultancy role also overlapped with managerial positions inside companies. In the case of FSAB several consultants were involved, who grounded advice on their own experiences from "successful" initiatives inside organizations, e.g. Xerox and ABB.

Consultants and researchers were setting up "ideal states" of well-functioning companies. As aids they had developed principles, practices and techniques which people in companies like FSAB adopted "in theory" at first. Then, as people at FSAB started to acknowledge the messages, they could go into a variety of possible patterns in orientating and taking actions. For example, managers at FSAB orientated and took actions within "ideal state" modes, developing visions, policies and goals for the development. They followed this up, or combined it by developing procedures which were intended to facilitate the development of interrelated processes towards ideal states. At times, they went into a fusion of modes that resulted in more systematized ways of working, following for example a specific routine for projects or for gaining awareness. At other times, they could go into a fusion of modes that resulted in more action-driven and spontaneous work approaches; or they could go into more "in theory"-driven work, mainly talking and writing without taking "visible" actions.

People at FSAB were exploring to find new ways of working, but often they did not systematically exploit what they had found in orientating and taking actions in "exploration" modes. They had problems in gaining value from new principles, practices and techniques. They were talking about principles like continuous improvement and they were doing e.g. failure mode and effects analyses as part of addressing principles and requirements. Much of this work took place in theory, however, and they had problems in developing their own way of addressing requirements, or applying principles, practices and techniques. Different methods or ways of working could be decided upon while orientating and taking actions in theory. Still, as part of the major and more complex patterns of organizing, they had difficulties in orientating and taking actions in other fusions of modes as they came back to their role in the operations. People perceived a rather inefficient and ineffective development at FSAB; on the other hand, this

inefficient and ineffective development could have been part of a major pattern leading towards progress. In the case of FSAB, though, patterns of organizing on a higher level stopped this progress. Too much time may have been spent on conforming, and as financial fluctuation forced changes, this more singular mode of organizing had not produced enough tangible results. On the other hand, relating to the history and preunderstanding at FSAB, the time spent in conformity modes may have been unavoidable. It would be easy to criticize in retrospect, orientating in "in theory" modes; but as we are in the midst of these complex patterns, what may seem strange can be quite natural.

The most explicit cases of conformity focus at FSAB can be seen in the work, from the mid-1980s until 2000, to satisfy the ISO 9000 and QS-9000 requirements. Nevertheless, people who were orientating and taking actions in successive conformity modes seemed to go into a rather stable, but slow, learning process over time. As they tried to develop more efficient and effective ways of conforming, they also directed attention to how to make the processes of the company more efficient and effective. One problem was that in conformity modes, people could direct attention to developing procedures without integrating this work with more process-oriented work. In fact, even what were defined as process-oriented initiatives were mainly focused on procedures. Hence, people attended to flow charts and drawing routines in a way that did not stimulate a process-oriented development, linking multiple disciplines and flows of work into a whole.

FSAB, like many other companies, had by the year 2000 striven to satisfy QM system requirements for 15 years. Over time, a search to conform in the most efficient way could stimulate people to orientate and take actions in learning modes. One example of orientating and taking actions in conformity modes, while gradually stimulating people to go into learning modes, is related to FSAB's TQM initiative; initiated in the mid-1990s and prioritized until 2000. The objective was to form a new culture for FSAB where all employees used their full potential to satisfy demanding customers' desires. To reach this, top management, with the aid of advisors, assessed that FSAB needed to develop a more process-oriented, structured and learning way of working.

In practice, the rhetoric among the directing managers directed attention to conforming to a certain way of orientating and taking actions. With persistence, however, people were starting to learn a new way of orientating and acting. They began to practise QM tools, in an integrated manner, as they addressed various problems or worked in projects. However, as FSAB had financial problems, a new president entered the company, and the managers reduced the emphasis on conforming to the TQM Ideas. In fact, the new

president stated that he could see no concrete effects of the investments in TQM and that now it was time to focus on the core of the business and to cut costs.

There were no more investments in TQM, but some persons felt that they continued the effort to make QM principles, practices and techniques part of their natural way of working. Over time, however, no one spoke about TQM. The new president did not address QM as a matter of developing the whole company in terms of addressing interrelated processes that together satisfied the customer needs. The new identity of QM was similar to the old way of viewing quality management; QM became one function of several in the company, with specific attention to understanding quality system requirements. The focus was more on quality assurance than on improvement and development in the quality department. This was due to the new president's assessment that, in the financial situation at the end of the 1990s, there was no time or resources available for the kind of QM concentration which had been the case previously.

The FSAB case points both at a lack of time, due to competition between different concepts and change initiatives, and at external and internal forces that disrupted initiated plans. Hence, multiple concepts stimulating people to orientate and take actions in certain kinds of modes, e.g. 'ideal state' modes, could have hindered people who were orientating and taking actions in other modes, e.g. emergence. On the other hand, people who orientated in emergence modes, while directing attention to negative experiences, could hinder positive effects of ideas growing in 'ideal state' modes. This is one example of several where people could have found synergies by orientating and taking actions through another combination of modes.

The FSAB case indicates that people at FSAB were unconsciously looking for synergies in complementary modes of organizing. One example is the search for stability and flexibility at the same time. The decisions to develop a QM system fulfilling the ISO 9000 requirements during the mid-1980s were taken in order to gain flexibility in the internal work, instead of being pressured by anticipated requirements later. The strategy was to develop a core competence in the requirements and their intentions in advance of coming customer demands. We can se the same approach in the decision approximately 10 years later to develop a QM system that fulfilled the QS-9000 requirements. In both cases, the focus was on gaining flexibility in terms of having time to develop a suitable QM system. On the other hand, in addressing the requirements people were forced into conformity modes of organizing. Furthermore, the work on the QM system was a matter of gaining stability in the sense of securing the internal processes and being sure that the operations would be legitimate on the market. People orientated and took actions in a fusion of stability, flexibility and conformity modes of organizing. In this fusion of

modes, they were also developing various procedures that were intended to satisfy requirements and facilitate a certain processes – e.g. production processes, competence development, advanced product quality planning, inventory management, non-conformance handling, and customer satisfaction assessment.

Looking at the development at FSAB it is clear that a process terminology, and conscious attempts to orientate in a process mode, do not signify a process-oriented company. Even the consultancy firm specializing in process improvement and management was not able to fuse procedure and process modes into a beneficial pattern of orientating and taking actions. They were not flexible enough in adapting to the conditions at FSAB. Altogether, the consultants involved in the process improvement project were not able to orientate and take actions to gain synergies and successive development in a fusion of complementary modes. The consultants were to facilitate process improvement, but they were stuck in other complex and emergent processes. They were stuck in their procedures while trying to facilitate process-oriented work, and they were stuck in focusing on an ideal state without having the flexibility that they needed to create a stable project at FSAB. If they had been flexible enough, they could have recognized the dynamics and conditions in the processes going on at FSAB, and on an international level. The project ended up in much organizing in theory with minor practical implications, except for plans that were on the agenda anyhow.

The experiences from FSAB suggest a way of orientating and taking actions where, most often, a fusion of 'in theory' and 'in action' modes was missing, and much time was spent on orientating in theory. Thus, people were either talking or reflecting on new ways of working, e.g. methods or new ways of handling complaints. However, there was often a gap between 'in theory' work and going into "in action" modes with a focus on actually doing something of value. People had problems of fusing 'in theory' and 'in action' modes into a balanced development addressing other types of modes, e.g. procedure and process. In practice, when attending to their normal tasks, people at FSAB were quite naturally orientating and taking actions in a fusion of modes. As they needed to go outside their current ways of working, though, a new situation emerged where they had problems in fusing complementary modes of organizing. Hence, in naturalizing QM, tensions are infused which break up stabilized patterns, and at the same time a new pattern of change emerges. In these changes it can be valuable to share a mental model of the nature of how people are orientating and taking actions. To recognize these tensions by addressing the patterns in which people are orientating and taking actions can be one way of developing an understanding of the problem of naturalizing QM – a shared understanding. By developing such an understanding, managers and consultants can better orientate and take actions in a way that yields a good return.

Reflection and tentative suggestions

At the beginning of this paper, I defined quality management as being *a matter of constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and adapting value adding principles, practices and techniques.* The purpose of the paper has been to develop a way of understanding the problem of naturalizing QM. In this final section, I will expand the discussion in relation to some chosen theories.

People who are part of an organization have complementary expertise, a type of knowledge in action as Schön (1983) describes it. In fact, Schön (1983: 54) describes some properties of "knowing-*in*-action" and states that: "it is in this sense that I speak of knowing-*in*-action, the characteristic mode of ordinary practical knowledge". Schön (1983: 50) argues that "knowing is inherent in intelligent action…the know-how is in the action". Referring to the modes defined in this paper, this would mean that to orientate and take actions in certain modes requires certain know-how. Schön (1983) actually points at two fusing modes – reflection and action. People's knowledge, according to Schön, is embedded in their actions, which would mean that different types of knowledge are compatible with different patterns of modes. Hence, as competence development is planned, we can reflect on which know-how we need to focus on.

To successively naturalize QM would be a matter of making it part of the various kinds of know-how that can be developed. One of these kinds of know-how may be how to fuse and alternate different modes of organizing, in order to stimulate an efficient and effective rhythm of improvement. To succeed in this challenge would require the capability of recognizing the variety of ways in which people orientate and take actions, and to facilitate value creation in any patterns of modes. The managerial role is one of recognizing tensions and synergies that may cause problems or opportunities. A way of sorting out these tensions and synergies may be to develop know-how in how to recognize patterns of modes and their consequences.

One question is then how it is possible to change patterns in the way that people are orientating and taking actions. To break out of a certain pattern and shift into other ones possibly requires the type of second-order changes that Watzlawick et al. (1978) describe. In these types of changes, people are altering the character of a system, in comparison with first-order changes which are made within an existing system and its characteristics.

Second-order changes are adjacent to the type of double-loop learning that e.g. Argyris and Schön (1996) describe. Both the notion of second-order changes and double-loop learning relate to how people may change some fundamental aspects of a social system.

This may be a matter of changing some aspects of a mental model, or of changing some aspects of one's values or theories in use. Referring to Alänge and Jarnehammar (1999), it could also be a matter of recognizing and changing the filter through which the systems are viewed. A question is how these changes may take place. To think about modes of organizing offers a way of understanding these changes in terms of shifting modes – that is, in terms of shifting attention and thereby gaining another perspective on problems and opportunities, or on how to act on these problems and opportunities.

Here and now, people are most likely seldom aware of the patterns of modes that represent their behaviours and activities. This is, again, adjacent with the type of first- and second-order changes described by Watzlawick et al. (1978). If certain solutions to problems within a system have been searched for, these 'solutions' may be part of the problems. It is common sense, one could say, that yesterday's solutions are the problems of today, as is elaborated on by, for example, Senge (1990) as part of explaining systems thinking. To attend to the way that people are orientating and taking action in varying patterns of modes offers one way of understanding yesterday's solutions. It offers a way of understanding defensive routines that, according to Argyris (1990), may hinder learning; and it offers a way of understanding misalignments between the types of subcultures that Schein (1996) proposed – "Operator", "Engineering" and "Executive". This is not to say that paying attention to modes of organizing is "the" solution to all problems in our ways of orientating and taking actions; it is a complementary view and one way of understanding. The proposed way of understanding in this paper may offer one way to recognize the contrasts in people's ways of working.

The contrasts between different ways of working can be relevant in understanding the types of tensions and force fields that Lewin (1948, 1952) proposes. Individuals, depending on their preunderstanding, intentions, and preferences, orientate and take actions individually and together. However, they do this in their own individual way, within a culture and among sub-cultures founded on their core identity and their multiple social identities (Miconnet, 2001). Hence, it is quite natural that there are tensions and that we create tensions of various kinds as we engage in quality management. The patterns of modes through which people orientate and take actions, referring to Lewin (1953), influence the force field in which change takes place. People who are used to orientating and taking actions in certain patterns may feel tensions and anxiety as new practices or techniques challenge their current way of working. Therefore, to develop a shared view, or mental model, based on an understanding of the problem of naturalizing principles, practices and techniques can be a way of preparing for change. Our way of "unfreezing" the way in which people are orientating and taking actions may influence our success in improving the ways of working.

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III Discussion, Implications and Suggestions

The purpose of this thesis is to develop an understanding of the problem of naturalizing quality management. In this section I discuss the contribution and my research process. Then I elaborate on the implications for researchers and managers if they recognize the contents in this thesis. Finally, I give some suggestions for future research.

Discussion

At the end of section one, before the appended papers, I referred to four questions, proposed by Gummesson (2006). He suggests that management researchers should ask themselves:

1. Do I address pivotal issues in research in [quality] management?
2. Do bureaucratic restrictions or entrepreneurial initiative and curiosity control my choice of problems to study, the methodology I apply, and the analyses and interpretations I make?
3. Does my research exert any impact and add value to people, organizations and society?
4. Do I believe, on the whole, that what I am doing is the right thing for me to do?

I will address these questions in the assessment of the contribution of this thesis, and in my reflections on the research process. Questions 1 and 3 will be addressed in the discussion of the contribution below, and questions 2 and 4 will be dealt with in my following discussion of my research process. Then I assess the research from a point of view; see the methodological stance and approach in section I. In this self-assessment, I use the concepts of validity, reliability and generalizability, referring to the definitions from Easterby-Smith (2002) as presented in column 3 in Table 1, in the description of my methodological stance in section 1.

Discussion of the contribution

As I discussed the contribution of this thesis, I realized that discussing it in isolation from some aspects of the process leading to the thesis was too fragmented a solution. Hence, while this part focuses on the contribution, I discuss it in relation to the work in writing the thesis. In the discussion I will address two of the four questions posed above, namely:

- Have I addressed pivotal issues in [quality] management research?
- Can my research, and this thesis, exert any impact and add value to people, organizations and society?

These two questions have implicitly driven me, since I became engaged in investigating quality management. Before I left FSAB, the objective of my investigations was to

address central issues in the management of FSAB, and to exert an impact directly through my involvement as an employee. I was involved in the staff and leadership-training programme and was responsible for the "business system development". In this role, I also facilitated people who were asking for support in different investigations. Now, in retrospect, I can see that I met the problem of naturalizing QM on a daily basis.

The thesis gives one view of change in a company, and it illustrates how each improvement initiative is part of a whole which is complex. The FSAB case probably resembles something that is typical in the real context of change projects. There seems to be a paradox! We need to delimit and focus in order to advance in research, but in doing so we may miss central aspects or dimensions which are crucial in understanding. I see a risk in mainly addressing specific parts taken out of context in QM research. In reference to Weick (1979) I see a risk that we construct rationalized patterns for the sake of writing papers, and in this way we avoid what is more complex to understand. I believe that there is a need both for delimited research, and for research, in line with the type presented in this thesis, which does not recoil from complexity. We need to recognize and address it in order to develop ways of orientating and taking actions. As I worked on the FSAB case, I did not conceptualize the problems in the way that I can today, with the aid of the thoughts in this thesis.

I have taken part in numerous dialogues, which I can now interpret as addressing problems of naturalizing QM or other improvement programmes, methods, etc. Today, as I engage in such dialogues, I can communicate about the problems in another terminology. This terminology facilitates contact regarding the problem of naturalizing principles, practices and techniques. Naturally, these are highly subjective perceptions, but they are central results of my research. They indicate what I assess as the central contribution of this thesis, namely:

> *The development of a way of understanding the problem of naturalizing value-adding principles, practices and techniques.*

My work on the four papers has been complementary in developing my understanding of the problem of naturalizing quality management. I hope that the papers are also complementary in stimulating possible readers' development. In my view, paper 1 gives a longitudinal perspective on any principle, practice or technique which people are trying to make part of the natural ways of working. In describing the development at FSAB in its environment of complex processes of change, it also gives a perspective on the situation of other organizations. I claim that the experiences at FSAB, while unique, also have characteristics in common with many other organizations.

As people are trying to bring in methods, more comprehensive approaches or certain principles or values, they are, in the terminology of this thesis, trying to bring in principles, practices and techniques. This takes place in a complex context of developments and patterns in which people are orientating and taking actions. Readers of paper 1 can reflect on their own experiences from other organizations in a comparative sense. I assess the central contribution of paper 1 (Book and Solly, 2005) to be a longitudinal description that we can use in reflecting and discussing the problem of gaining results from improvement initiatives. In fact, this is the way that I have used paper 1 in writing this thesis. Furthermore, the description inspired my opponent on my licentiate thesis (Book, 2005) to engage in a dialogue on the problem of developing new and natural ways of working. In the other three papers (2-4), I went into three different modes of organizing to further my understanding from working with the FSAB case.

After writing paper 1, Alänge and I brainstormed and reflected on the development at FSAB; we listed numerous matters of interest in the case. We also conducted tentative affinity analyses to find the central issues to bring forward in a first analysis of the FSAB case. In a previous version (Book et al., 2004) of paper 2 (Book et al., 2005) we integrated what we found in the case study into a view of the development at FSAB. I assess the main contribution of paper 2 as being the integration of central observations in the investigation of the FSAB case. It gives many openings for further analysis and, not least in this paper, we for the first time expressed the problem of naturalizing QM at FSAB, in our proposal of focusing QM on achieving an “invisible success”. Paper 2 also provides an account of the many facets of development in an organization.

After writing paper 2, I engaged in elaborating the concept of naturalizing QM loosely coupled with the FSAB case. Gradually the elaboration led to a focus on understanding the problem of naturalizing QM through a conceptual investigation. What was this problem about, and in what terms could I address it? I used complementary theories that could aid my development of understanding, but I was certainly thinking about my experiences from FSAB as I wrote. The aim of paper 3 is to elaborate freely to find ways of communicating about the problem of naturalizing principles, practices and techniques. I assess the main contribution of paper 3 as being the multifaceted elaboration on the problem of naturalizing QM. There are many openings for reflections, and a flora of terms, which we can apply in communicating about the problem. Furthermore, in writing paper 1, I gained a distance from the FSAB case, which in retrospect I consider to have been valuable for the further investigation.

In practice, I wrote papers 3 and 4 through two parallel and intertwined processes inspiring each other. Paper 3 is theoretical and conceptual; it does not relate explicitly to

the FSAB case, while paper 4 links back to the FSAB case. In paper 4, I went back to the experiences and data from FSAB, with the aid of the description in paper 1. The latter paper functioned as a framework for reflecting and having dialogues on the problem of naturalizing QM. However, I went back to the original data to find words spoken that could function as a source for reflection in understanding the problem of naturalizing QM. I assess the main contribution of paper 4 to be a way of thinking, and communicating, about problems of making any principle, practice or technique part of the natural ways of orientating and taking actions.

Have I, then, addressed pivotal issues in management research?

I am confident that I have, and I hope that others see this too. The way of understanding suggested in the thesis would be relevant for both researchers and practitioners who are orientating and taking actions in their work. I have met several persons in the research community, and in industry, who, I believe, could gain value from reflecting on their work with the aid of this thesis. People in industry as well as in research are spending substantial resources on developing, applying and adapting new principles, practices and techniques. New methods and comprehensive models for development are spreading in society. The ideas are shifting and so are the managers, researchers and consultants who are promoting and facilitating the implementation of the ideas.

Certainly, many researchers have addressed the process and problem of developing, applying and adapting principles, practices and techniques, so that they add the greatest possible value for customers and other stakeholders. In fact, we can see that research and books on change (e.g. Beer et al., 1990 and Abrahamson, 2000), learning (e.g. Argyris and Schön, 1990 and Senge, 1990), institutionalizing (e.g. Scott, 1995 and Jepperson, 1991), and diffusions of innovations (e.g. Rogers, 1995 and Alänge et al. 1998) in one way or another address these issues. Hence, this thesis addresses a general problem in many organizations that many students of organizations address. Why? My perception is that the problem addressed lies at the core of what we engage in as we are trying to develop any organization with the aid of new or already known principles, practices and techniques. This leads to the second question raised in this discussion of the contribution made by the thesis:

Can my research, and this thesis, exert any impact and add value to people, organizations and society?

In answering the first question, as to whether I am addressing pivotal questions in management research, I have implicitly addressed the second question. Since I believe that this thesis addresses a general problem of interest in many organizations and in

society, I also believe that there is a potential of exerting impact. I will use my experiences and my understanding developed while working on this thesis, as I work with and in organizations. It is also likely that I will continue to give lectures and workshops, and then I will integrate aspects from the thesis. I also know that my supervisor, Sverker Alänge, has addressed the problem of naturalizing QM as part of lectures and seminars. Hence, I believe that the thesis can exert impact and add value to people, organizations and society.

In fact, Alänge came home from a presentation where he had elaborated on the issue of when we can view QM as being successful. He had described the idea of working to reach an "invisible success" and argued that, when QM is successful, it becomes embedded and integrated. He elaborated on the problem of naturalizing QM. This way of understanding, which may seem obvious, gave an "aha" experience to one of the participants, who came forward after the presentation. Alänge related that the person expressed something like this: "You know, I have never looked at it this way, but this is of course how it is… When we are successful it becomes invisible".

As I was working out the ideas of how to understand the problem of naturalizing QM in terms of modes of organizing, I talked to anyone I met who showed interest. I took every chance to "pull" persons with an interest in what I was doing into my room. I also talked about the emergent view in different seminars. In one conversation with a top corporate quality manager in a larger company, his response was that "this was exactly what we are tampering with on a daily basis". Alänge, who has his room next to mine, noticed that the manager seemed happy as he left my room, and personally, I was thrilled that someone appreciated my thoughts. I had been working hard to understand the problem of naturalizing QM. This brief talk in my room was one of the first "tests" of the ideas in communication with a person outside the group with whom I communicated on a more frequent basis. Another manager told me that in developing their new approach to process management, they had recognized some of my comments at a seminar. I do not know which, but I was happy to hear this. I hoped the ideas were good and that they were interpreted in the way that I wanted.

Referring to the above examples, I believe that my research already has had an impact in communication with different persons. In my assessment, this thesis can be one source of inspiration in developing our capability of having good timing in orientating and taking actions. It can contribute to the development of understanding why people are addressing the same principle, practice or technique in so many ways. It can contribute to developing an understanding of the tensions that influence progress in positive or negative ways.

I propose that managers and consultants could benefit from learning how to recognize the modes of organizing proposed in this thesis, but most of all they could benefit from the way of orientating that it suggests. Perhaps the most central opportunity may be in developing a shared model and understanding of the variation in how we all orientate and act. If we develop such shared models, perhaps we can avoid too destructive tensions and instead stimulate creative tensions.

Discussion of my research process

What are the central issues that I want to address in this discussion of my research process? In a previous draft, discussing my research process, I expressed myself through references to a series of authors writing about research methodology: e.g. Alvesson and Sköldberg (2000), Arbnor and Bjerke (1997), Dahlbom (2002), Dyer and Wilkins (1991), Gummesson (1991), Pool and van de Ven (1989) and Weick (1989). Then my way of orientating changed, and I decided to discuss my research process by driving the thoughts through my own way of orientating, rather than through other persons' views on research. Some references will aid the discussion, but I will come back to others as I attend to the implications for research. I decided to do it this way as a consequence of reflecting on the first of the two central questions below.

- Did bureaucratic restrictions or entrepreneurial initiative and curiosity control my choice of problems to study, the methodology I applied, and the analyses and interpretations I made?
- Do I, on the whole, believe that what I did was the right thing for me to do?

These two questions will not occupy the whole discussion, but they serve as a starting point and as a tool in describing my retrospective view on my research process. To discuss my research process means that I reflect on my experiences and the way that I have been working and developing my understanding. At the same time, working towards finalizing the thesis also means that the competence in reflecting is part of my professional skills. Hence, this part contains my personal and professional view of the way towards this thesis.

The initial intention at FSAB was to drive action research, in which I would successively orientate and take actions to influence the development at FSAB and to develop understanding through this involvement. In retrospect, I value the fact that I had the

“opportunity” to experience what many employees had previously experienced at FSAB, namely to feel that my contribution was of minor value. I felt for some time that what I had been dealing with at FSAB were only fragments of major patterns of development. I had the chance, however, to gain distance and value what I did at FSAB. What is more, in writing this thesis I used my experiences in learning more about research and writing. I am convinced that, depending on how we orientate and take actions within the major patterns, we influence the development in our local context. Perhaps, at times, we also influence the major patterns.

As I left FSAB, I was already involved in a comparative case study at Chalmers University of Technology. In this study, my supervisor Alänge and I facilitated the start of two process improvement projects, and then we followed up and interviewed participants in the projects (Alänge & Book, 2001). I also became involved in a survey study of improvement work in Swedish health care (Book, Hellström & Olsson, 2003; Olsson et al., 2003). Together with the first paper from the FSAB study (Book et al. 2004) these three studies were the appended papers in my licentiate thesis, Book (2005). During the work towards the licentiate thesis, my understanding of research evolved. I also realized the value of my preunderstanding and access to the FSAB case. However, I did not fully recognize the potential until the opponent (José Fonseca) of my licentiate thesis catalyzed the focus of this thesis. A first step forward was taken in a reanalysis of Book et al. (2004) resulting in paper 2 in this thesis (Book et al. 2005). In relation to this, Solly and I revised the description in Book and Solly (2005) to make it more clear.

I chose to focus solely on the FSAB case, and on the problem of naturalizing QM. The problem inspired me. I believed, and still believe, that my best opportunity to contribute something of value was to investigate this problem on my preunderstanding and data available in the FSAB case. In retrospect, I assess paper 1 as giving a good overview of the development at FSAB, and it indicates the complexity in the QM development over time. The description illustrates the flux of principles, practices and techniques, and competing projects and agendas involved. However, today I would have described the development in a more active language, illustrating more what people thought, how they interacted, and how they addressed the flux of principles, practices and techniques. If I had written paper 1 (and 2) today, I would have gone more into detail on some selected ways of working. Then I would exemplify and illustrate how a certain person or group of persons orientated and took actions. I would also describe my own thoughts and reflections, and involve myself in the description in the way that, for example, Gravesen (2002) does. This is because along the way I have left a certain notion of how to write – I have left a focus on avoiding bias.

In addressing my developing understanding of the process of writing, I want to stress a technical matter. I have been working for more than five years on developing my way of writing (I had, in my development plan, a central aim of developing a skill in writing and thinking efficiently and effectively in interaction with the computer). I decided that during my time at Chalmers I would develop a speedy and intuitive way of using all of my fingers in thinking and writing. I have noticed that I have developed a technique in communicating with my own thoughts with the aid of the computer. As I see what I write, I get feedback and new thoughts, and this creates a rhythm of writing, in a similar way as I can have a good rhythm in running, or skating with my inlines.

Referring to paper 1 again, I seldom felt the rhythm in writing described above. Instead, it was a struggle to describe the development at FSAB. I rationalized the case description, and wrote what I could easily extract from the data. I had substantial access to data and a well-developed preunderstanding of QM at FSAB, especially since I cooperated with the former quality and development manager at FSAB. Nevertheless, I could not quite get as much out of the case description as I wanted. This was partly a problem in my developed preunderstanding of the many ways that people are orientating in relation to a not so developed understanding of research. I have seen how people, depending on their mood, their current situation or the timing of conversation, can give different views on certain topics. This means that I have a critical view of data, and in my understanding, depending on the "modes" in which people are orientating, they express themselves in different ways. Hence, as we are analyzing narratives from interviewees, we are analyzing their construction of a "pattern" of the development, as seen with a certain fusion of modes (see paper 4).

In my search for better understanding, ever more facets and dimensions appeared in the study of QM at FSAB. I started to mistrust the more linear ways of working in research; hence the more stepwise-oriented investigations, going from A to B to C etc in order to reach a final result in stage X. Instead I came to move in circular, spiral or "chaotic patterns of investigations and reflections; see Figure 11 .

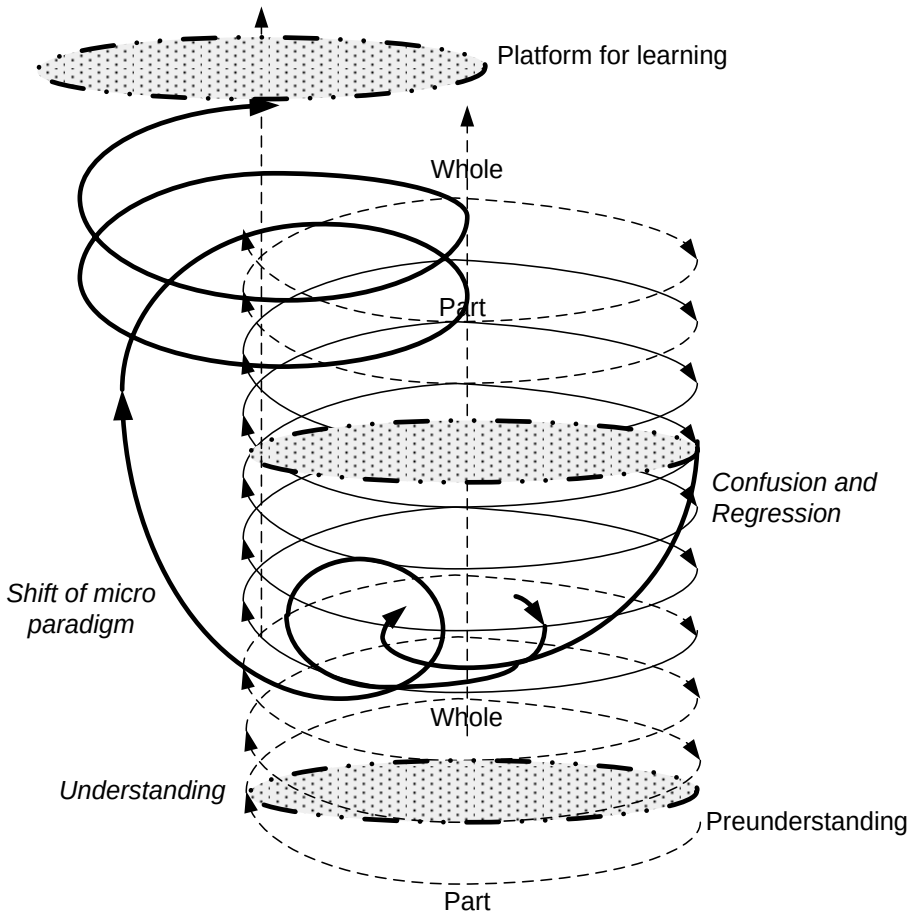

Figure 11 A tentative visualization of my research process – inspired by Alvesson and Sköldberg (2000) and Gummesson (1991).

Successively, through multiple feedback loops my understanding of research and of QM evolved. Although in some periods I had a feeling of confusion and even regression, I believe that my understanding of QM and of the problem of naturalizing QM has been improving through these phases. The periods of confusion and regression have been essential in what I call *changes of microparadigms*. In these microparadigms, I have gone through a process in which I have transferred the logic of my understanding. My platform for learning has changed in the same manner as when a paradigm is changing. According to Arbnor and Bjerke (1997, p. 10), most persons change their ultimate presumptions at most once in a lifetime, when they "change their minds completely about what they earlier believed in and become critical of their own former thinking". Such total shifts of

paradigm, Arbnor and Bjerke (p. 10) explain, are often revolutionary and may lead to a personal crisis as well as – after a while – "to great happiness". In reference to the above discussion, I will address the question:

Did bureaucratic restrictions or entrepreneurial initiative and curiosity control my choice of problems to study, the methodology I applied, and the analyses and interpretations I made?

Entrepreneurial initiative and curiosity drove me in my first phases while being employed by FSAB. They continued to drive me, and I have certainly focused on a problem that I find interesting. In viewing what I have done, I am sure that I have been driven by entrepreneurial initiative and curiosity in almost everything I have done in my process towards the thesis. This entrepreneurial initiative and curiosity drove me into a case study that has been challenging for a beginner in research. Nevertheless, I find it worthwhile and I am satisfied now with the experiences and understanding that I have gained. This leads to the second question.

Do I believe, on the whole, that what I have done has been the right thing for me to do?

Naturally, in retrospect it is easy to answer positively on all of the questions. Hence, it may seem that I am making "positive" sense of my work and experiences. Nevertheless, I intuitively feel that what I have done has been the right thing for me. To have the opportunity to gain access to the research community and to have a chance to learn how to conduct research has been a privilege. I also believe that my work can be of value in the future, even if I am fully aware of the need for further development and concretization.

Self-assessment of validity, reliability and generalizability

In this assessment, I use the concepts of validity, reliability and generalizability, from a point of view, as defined by Easterby-Smith (2002) as presented in column 3 in Table 1, in the methodology in section I. In this table the validity criteria address whether the study clearly gains access to the experiences of those in the research setting. The reliability criteria addresses whether there is transparency in how sense was made from the raw data. Finally, the generalizability criteria addresses whether the concepts and constructs derived from this study have any relevance to other settings. I will briefly comment on how the methodology and this thesis contribute to satisfying these quality criteria.

Did the study clearly gain access to the experiences of those in the research setting?

In fact, I have myself been one of the persons in the research setting and my main supervisor had been one of the actors during the TQM development during the 1990s. Furthermore, I have cooperated with Barry Solly, the quality and development manager at FSAB, from the start of the operations in 1984 until 2000. With a Ph.D. in material science and core knowledge of and experiences from supporting customers, he had a deep understanding of the company and its products. He had been involved in the FSAB operations since 1974, and even knew the operations before FSAB was constituted.

Besides this cooperation with people with extensive understanding of FSAB and its QM journey, I have had the role at FSAB of orientating with the aid of a wide variety of persons' narratives. I have taken part in the leadership and staff development programme and struggled with the same type of difficulties that many others in the company have. As I conducted the 23 interviews together with Solly, we had a well-developed preunderstanding. These interviews gave still more access to experiences of those in the research setting. This access to people was complemented by investigations into substantial documentation.

From my point of view, on the above, I have had excellent access to those in the research setting.

Is there transparency in how sense was made from the raw data?

I have striven to be transparent, but on this question I am still hesitant. I have described the rather complex process of orientating and taking actions that led to this thesis. However, in comparison with Gravesen (2002), to whom I referred in order to contrast my own research in the description of my methodological stance and approach, the thesis may be vaguer in describing how I made sense in detail. A reader may have difficulties in understanding exactly how I have come to the way of understanding that I have. On the other hand, in viewing the thesis as a whole, I assess that the transparency is high. The eventual problem in understanding how I have arrived at what I have is consistent with my approach. It has been a complex process of organizing and making sense and this is also how I have described the work. Hence, similarly to people who describe their tacit knowledge, I have had difficulties in describing how my understanding developed and how I made sense of the data.

In reference to the above, however, I have not claimed to have gone through certain procedures. Instead, I have focused on giving a "feeling" for the dynamic process of investigating and learning that has produced this thesis. I make no claims of having

described the “reality” in the development at FSAB, but I claim that Barry Solly and I provide a good overview in paper 1, given the clarifying delimitations. I have thoroughly described my methodological stance and approach, and have exploited my own experiences in interpreting data and in developing an understanding of the problem of naturalizing QM. I also offer an overview of how the papers relate to each other, and how I produced them in cooperation with other persons. As part of this, I introduced each paper, setting it in the perspective of the whole thesis. In conclusion, it is problematic to describe exactly how I made sense, but the thesis is transparent in clarifying this and in presenting my view of the study and the dynamics of making sense. Thus, I infer that, even though there may be some questions on how I made sense, the transparency is high.

Can the concepts and constructs derived from this study have any relevance to other settings?

In the light of what I have written above in this thesis, my assessment is obvious. I believe that the concepts and constructs have relevance to other settings. I assess the concepts and constructs to be generic, and that we can apply them in addressing many other settings. This is also, what my third supervisor, José Fonseca, explicitly expressed in a telephone conference. He said that he could see a wide variety of situations or problems when the way of understanding proposed in this thesis could be useful. However, I believe that it can be difficult to use the concepts directly in communication. I believe that the advantage is in developing mutual understanding and shared views, or mental models, on how we orientate and take actions. We can also use the concepts and constructs for diagnosis of a problem or situation, but I think it is central to use “normal” language and not to go into a meta-mode of communicating via terms of “modes”. Hence, we can use the concepts and constructs in developing understanding, but we need to engage in a “natural” language. To exemplify what I mean, I will refer to an example of process management.

As I, and others, analyze and improve processes, we may tend to communicate in terms of processes. We describe what we do and what we analyze in terms of processes. This does not mean, however, that we are really working in a process-oriented way. We use a type of “meta-language” addressing processes, but we may not be profoundly orientating and taking actions in a process-oriented way. My point is that if we express everything in terms of processes, we may distance ourselves from people who are just engaged in satisfying customers. We may distance ourselves from the people who are working in the processes that we aim to improve. If this were the case, I would say that we have not been process-oriented in our work. In the same way, I see a risk in communicating in terms of modes. Such communication may easily emerge into a meta-language and a distance

from the operations. Nevertheless, in both the process and mode cases, I see the relevance of developing shared mental models that can facilitate communication and contact. I also see a relevance in applying “process thinking”, as well as “modes thinking”, in diagnosis and development work.

Implications and future research

This final section of the thesis discusses and suggests implications for research and management. Then I give some suggestions for future research.

Implications for research

Models of thought spread in society (Czarniawska and Joerges, 1996). They stimulate diverse sets of QM perceptions, even if the institutional forces are strong in the quality field (Abrahamson and Fairchild, 1999; Staw and Epstein, 2000). Furthermore, as these ideas spread in an organization we filter and translate what we sense, and hence within an organization there is a variety of perceptions of ongoing QM work. This presents a complex situation in the study of QM; and Dean and Bowen (1994) point out that different researchers and promoters have contributed to the ambiguous nature of QM. In my perception, this ambiguity is quite natural, and perhaps healthy. It forces us all to orientate in more modes than only conformity or "ideal state". We need to recognize the dynamics and complexity (Gummesson, 2006), and we need to develop our ways of working in and with them. This thesis proposes that our chances of succeeding may increase if we successively develop our understanding of different modes of organizing, and of what influences our ways of orientating and taking actions.

To reflect on the patterns of modes through which we orientate and take actions can be a way of understanding what type of contribution we can make in our research. Take for example the studies by Hendricks and Singhal (2001) who use the Malcolm Baldrige National Quality Award for selecting "TQM companies". In the control group they have other organizations who are not deliberately using the award as a tool in their development. What are they really studying? By orientating in terms of modes of organizing, there is a possibility to address systematically how people are applying an award model. What types of patterns stimulate which types of development?

I can see the relevance of conducting the types of studies that Hendricks and Singhal (2001) are doing, but I hope they are aware of the wide variety of patterns in which people, in their selected companies, are orientating and taking actions. Furthermore, I hope that they are aware of the fact that they are themselves orientating and taking actions in a certain pattern of modes. They do their work in more or less shifting fusions of modes. I see a risk that researchers investigating practices and techniques, or certain principles and their relevance, do not recognize patterns in their own way of organizing that may confound their results. In reference to hermeneutics (Alvesson and Sköldberg, 2000), I hope that they themselves reflect on their own intentions as they are elaborating with the data from these studies. This is in line with Gould (1996) who gives multiple

examples of the “mismeasure” of man, and poses several arguments for why researchers could and can find what they found and find in their data, even though in retrospect it is quite fascinating to see their conclusions. I do not only ground these issues on the experiences from the study. I know that these thoughts are highly inspired by my interpretations of what Professor Bo Bergman has described on many occasions. Professor Bergman has both extensive practical as well as academic experiences from industrial statistics and quantitative research.

Naturally, it is problematic to realize fully in which patterns of modes we are orientating and taking actions. What I am addressing is that people involved in research should be aware of the fact that they are conducting their work in fusions of modes. Depending on their patterns, they may end up with different findings and conclusions. I claim that this is relevant for any research. Two papers may on the surface point at similar findings, but if the researchers have orientated and taken actions in quite different modes of organizing, what seems to be the same may be different. I claim, in line with Batesson (1972), that these differences make a difference.

Researchers often take a stance in other people’s definitions as a rational way of addressing quality management research; I claim that there is an inherent risk in this approach. In line with hermeneutics (Alvesson and Sköldberg, 2000), we have problems in understanding what the “inventors” of the definitions were really thinking and intending as they designed their definitions. Neither do we know in which modes of organizing they were orientating and taking actions. Interview ten persons, and they will all orientate in different patterns as they contribute to the interview. Even if they are saying the same thing, they may orientate differently behind the words. Hence, even if we codify, categorize and analyze the data in a rigorous and systematic way, in line with e.g. Strauss and Corbin (1990), we do not know the patterns of organizing behind our data. Our data will always be ambiguous, even if we attend to rigorous analyses.

Ambiguity, according to the above, is natural, but researchers can try to reduce it by giving their own view of how they have orientated and taken actions. This is nothing new; it is the aim of describing one’s methodology. However, I claim that the current language of research, including arguments for validity, reliability, generalizations, etc., can be misleading, because it can attract people, to orientate in a way that does not recognize the variation introduced as researchers and interviewees orientate in different modes of organizing. It can attract people to construct patterns in what they study, in order to gain support for having high validity, reliability and generalizability, with arguments, which are quantitative in nature, even though there is “qualitative variation” which could make these arguments obsolete. I do not oppose quantitative methods, but

am claiming that in research on complex processes of change we need to recognize variation of different natures. This research supports the relevance of using the type of contrasts in possible meanings or interpretations, in line with Pool and van de Ven (1989). In the contrasts and possible meanings and interpretations, we may find something interesting and relevant that can aid our development of understanding.

Leigh Star and Griesemer (1989) show the tensions and dynamics that varying perspectives stimulate. They point at the problem of defining concepts and finding common interpretations. Rather than searching for exact common definitions of such complex concepts as QM, we should recognize that "new objects and methods mean different things in different worlds; and actors face the task of reconciling these meanings if they are to cooperate" (Leigh Star and Griesemer, 1989: 388). Similar to Schein (1996), this points at the risk of misalignments between individuals who belong to different cultural communities within an organization. These communities may be misaligned due to their different ways of orientating and communicating. On the other hand, referring to Fonseca (2002) these discrepancies in orientating and communicating can also open up for and stimulate innovative thoughts, if this potential is recognized. Hence, even if we have substantial data from a wide variety of complementary sources, we will always have variation in people's ways of orientating and taking actions. This forms a pattern behind the pattern, which may confound the order we find in our data. If twenty persons give the same answer to a certain question, they may in fact have given twenty different answers, due to their different ways of orientating.

The implications of the foregoing line of reasoning may be disillusioning, since the question that I once got at a wedding, regarding my explanation for what I was doing, is relevant: "Is it possible to do research on that?" I believe the answer to this question is affirmative. However, referring to Dahlbom (2002) management research is a matter of being involved in an "artificial" science, in which we recognize the difficulties in understanding reality as it is, or as it works. To reflect on the patterns in our modes of organizing can be one way of recognizing these difficulties both in research and in industry. A question is how to take actions on what we find while reflecting, and learn from these reflections. How can we successively orientate and take actions and develop our understanding and capability of orientating and taking actions?

Managerial implications

To discuss the implications for the practice of QM, we need to recall the definition of QM in this thesis. It is *a matter of constantly orientating and taking actions to fulfil, and preferably exceed, customer needs and expectations, by developing, applying and*

adapting value-adding principles, practices and techniques. I have proposed that people are orientating and taking actions in a variety of modes. Depending on the pattern of modes, the developed, applied and adapted principles, practices and techniques have different meanings and implications.

For people, e.g. top managers who are orientating and taking actions on their level, and with their main responsibility, to investigate a certain process has its dynamic. For an operator or any other person involved in the core operations, the dynamics in a process analysis can be quite different. Operators may be used to organizing in action, and going into a more "in theory"-oriented way of organizing may take them into a mode that they are not used to or comfortable with. They are also close to the operations and may anticipate a response in actions having positive impact on their concrete work. To gain only awareness of certain problems, without taking actions to solve them, may be frustrating and create cynicism. On the other hand, top managers may find value in the understanding itself, and in the flux of ideas, projects, external and internal requirements. Depending on their way of orientating, they may not have the need for instant actions to feel satisfied. They may be used to looking into the future and planning for change, and for long-term projects, without taking instant actions. However, if they orientate and take actions in a certain mode of organizing, creating tensions with people who orientate in a different way, this may result in problems – mistrust, cynicism and other negative notions.

Concrete actions from a top management perspective may be the reduction of personnel or taking investment decisions. Such actions, if not related to the promoted principles, practices and techniques within an improvement programme, may cause tensions and problems. Depending on the employees' prior experiences from orientating and taking actions in certain modes, they might be sceptical even before the initiative has started. In this sense, they may be orientating in a fusion of specializing, emergence and stability modes of organizing, criticizing the initiative through their specialty, their prior experiences and the will to have time for concentrating on their work. People in the core of operations may successively lose their trust in a certain programme. They may face promotions of a certain way of orientating and taking actions, and then they may see another way in practice. This was actually the case on many occasions at FSAB. As the top management group met, they were not naturally using the principles, practices and techniques that they themselves had promoted.

On one occasion, before an important top management meeting, we even practised how to investigate a central problem with the aid of a relationship diagram or an affinity diagram. After the meeting, I asked how it went, and how they had succeeded in their

analysis of the problem. The quality and development manager answered that they had communicated so much about the problem and other issues that they had no time to apply the "tool". I looked at him with surprise, and asked. "Did you communicate so much about the problem that you did not have time to use a practice for communicating about problems?" In the actual situation of having a top management meeting, it was simply not natural to communicate via practices and techniques for communicating. However, it was quite common to communicate about such techniques, and about the importance of developing new and more efficient and effective ways of working.

If a company takes an initiative to develop its operations through promotion of certain principles, practices and techniques, people, depending on their preunderstanding, will orientate and take actions in a variety of modes. They may take part in education, mobilization of resources, starting of new improvement groups, etc. The top managers may see the investments as a wide investment programme in developing the same type of competence in the company. They may be orientating and taking actions through a pattern dominated by a fusion of "ideal state", learning, and conformity modes, focusing on competence development in the initial phase. In doing so, they may miss the fact that several of the persons who take part in the training activities cannot avoid the impact of their prior experiences. They are using their access to the "reality" with the aid of the preunderstanding build partly on prior experiences. They may actually be skeptical or even cynical from the beginning, if they have experienced previous "failed" initiatives. Alternatively, they may be positive since they have positive experiences. Anyhow, it is central that managers understand that people are orientating and taking actions in a variety of ways, throughout the improvement initiative, and that this may cause both negative and positive tensions.

If managers recognize the way of understanding proposed in this thesis, they can perhaps promote a sustainable approach to development. If people in an organization share the view that we are all orientating and taking actions in a variety of ways, this may be a good platform for development. Through this shared "mental model" of reality, people in different cultural communities or with different roles can make contact. They may develop a better understanding of variation and a curiosity in how different persons orientate and take actions. Instead of being frustrated, as two persons who do not understand each other's views or actions, they may reflect on how the other person is orientating and taking actions with the aid of the understanding of modes of organizing. If people share the mental model that people are orientating in a variety of modes, then they may be able to understand a situation or a problem in another way. With this understanding, we can also match people with different preferences and skills in setting

up a team for an important project. One key would probably be that we recognize the complementary types of value that we can create in different modes.

Another example, pointing at the managerial implication of understanding: why people are naturalizing a certain principle, practice or technique can be illustrated if we address the concept of process management. Managers or consultants typically initiate process management or improvement by conducting extensive process analyses, to gain awareness of the business processes in the organization. Then after these analyses, the intention is to conduct gap analyses and address these gaps through a developed action plan. During the analyses, however, people are often coming up with various ideas. These ideas may at best be documented in a "parking lot" for ideas, but in the worst case the response is that "we should stick to the purpose of our meeting", that is, to map and analyze a certain process. In both cases, this way of orientating and taking actions are taking place in a certain pattern of modes. It may be in a fusion of "ideal state", specializing, conformity, procedure, and stability modes of organizing. In this case, people may experience a lack of flexibility and gain a feeling that their participation will lead nowhere. They may perceive that their current needs in their processes are not recognized, since their most valuable suggestions are put aside even though the aim is to improve the efficiency and effectiveness of operations. They may implicitly feel that the focus is on the procedures for process analysis and not on creating value for customers. On the other hand, if people are brining up all kind of ideas, and a group does not follow any procedure, then two hours may have passed without progressing fast enough to keep a good rhythm of development.

The point is that in order to succeed in improvement initiatives, managers and facilitators need to develop expertise in how to orientate and take actions in a variety of modes. They need to develop a capability to have good timing in their way of orientating and taking actions. I propose that to recognize the variety in people's ways of orientating and taking actions can be one way of understanding the problem of naturalizing principles, practices and techniques. To develop sensitivity, in recognizing different characteristics in the way that we and other people are orientating and taking actions, can thus be a way of developing the capability of managing or leading work. We all need to develop our capability of recognizing differences that make a difference.

I propose that managers need to recognize the variation in the ways that we all are orientating and taking actions and that this creates tensions. These tensions may be destructive or stimulating. Whether the development has one or the other tendency may depend on the way that we relate to the variation. If we develop a shared mental model with the aid of the proposed way of understanding the problem of naturalizing principles,

practices and techniques, we may have a more stimulating environment. One way of developing this skill may be to start training to recognize patterns of various kinds. To invest money in training a certain well-recognized and proven method may result in problems, depending on the overall pattern in a group of people's ways of orientating and taking actions. By recognizing tensions in the patterns, we could perhaps have avoided or minimized the difficulties, simply by orientating and taking actions in a way that was more compatible with the current patterns. On the other hand, we may also recognize patterns that we consciously want to break up.

The above discussion of implications leaves many questions unanswered. We need to gain further understanding. However, I believe that if managers are starting to recognize the modes of organizing in which people in their organizations are orientating and taking actions, perhaps they can avoid vital mistakes. Moreover, they may catch opportunities in a better way, and they may recognize what is not directly evident in what they experience or observe. Today, researchers, consultants and managers are promoting and applying robust design methodology – Six Sigma, Design for Six Sigma, Lean, and other concepts. They perhaps could benefit from taking a step back, to reflect on their own patterns in orientating and taking actions, and on their clients' or customers' patterns of organizing.

Future research

In this final section of the thesis, I suggest a number of questions that I find exciting to consider. The questions are directed at the future, and they indicate a certain contribution of the thesis that can be relevant for people, organizations and society. The proposals in the thesis can be used in developing shared mental models and creating contact between people in society. Challenging, yes! I am curious as to how I will be able to benefit from the developed thoughts in my continued work.

Organizations are spending billions of dollars on gaining effects from a variety of principles, practices and techniques. Take the example of ISO 9000, which more than 500 000 companies are using. What a waste of resources, if their investments do not give the best possible payoff. Another example is the current investment in Six Sigma. Could an increased understanding of patterns in those organizations investing in Six Sigma make the application and adaptation of principles, practices and techniques more efficient and effective? Could the understanding influence those experts who are developing such principles, practices and techniques? These are some general questions which I find interesting.

Below I give twelve suggestions for studies that could further our understanding. The list could be much longer, since I find it quite easy to think of interesting studies where the

thoughts in this thesis could be a starting point. Personally, I anticipate going into new patterns of organizing in industry. Perhaps sometime in the future I will go back and investigate some of the questions more systematically. Nevertheless, I will bring the questions with me and try to develop my understanding in any situation where I work.

1. Investigate the problem of naturalizing certain principles, practices or techniques in an organization, e.g. by studying process orientation, process improvement and certain techniques, or any other specific concept.

2. Make a comparative analysis of the problem of naturalizing certain principles, practices or techniques.

3. Investigate how it is possible to address principles, practices and techniques in a way that facilitates naturalization.

4. Conceptualize further the modes of organizing and their relevance.

5. Conduct case studies with the aim of identifying relevant modes of organizing that influence the development of an organization.

6. Investigate how modes of organizing can be addressed in understanding innovation processes.

7. Investigate cultural differences – national, regional, organizational – in terms of modes of organizing.

8. Investigate subcultures in an organization from a mode of organizing perspective. Can subcultures be identified and understood by addressing the pattern of modes?

9. Investigate modes of organizing and their relevance for change management.

10. Investigate modes of organizing in entrepreneurship, patterns in different countries, in different companies, in different sizes of companies – small, medium and large.

11. Investigate modes of organizing in different stages of development, in crisis, in initial phases of an organization, etc.

12. Develop tools for investigating patterns of modes.

If our capability of recognizing patterns of organizing were to increase, perhaps we could use our resources in better ways. I believe that to address the problem of naturalizing principles, practices and techniques by means of recognizing modes of organizing can be central for organizations and for the development of society. People are trying to solve conflicts in the world; managers are struggling with variety and alternative principles, practices and techniques to develop their organization. I am bold enough to suggest that to build further on the way of orientating elaborated in this thesis could increase our understanding of why we gain, or do not gain, good results from our engagement in developing our operations. Such an increase of understanding could influence our efficiency and effectiveness in managing resources for improvements.

References

Note: a few of the references below have been given in previous versions of the thesis, but they may have lost their place in the text during the process of writing. To acknowledge these authors' contributions, and to manage my own resources, I still retain them in the list of references.

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Index

Space for notes and reflections

Founded on an idea that professor Bo Bergman posed in the corridor at Chalmers, I append this space for taking notes and reflecting on the contents or on anything else.' on my own idea, I have appended some central concepts from the thesis, to facilitate any notes taken that refers to the central ideas in this thesis.

Central general concepts: Pattern, Process, Organizing and Making Sense, Orientating and Taking Action, Modes of Organizing, Quality Management, and Naturalizing Quality Management.

Modes of organizing: specializing and integrating, 'ideal state' and emergence, conformity and learning, exploration and exploitation, stability and flexibility, procedure and process, 'in theory' and 'in action'.
