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Total Quality Management in the Swedish food industry

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Abstract

Title: Total Quality Management in the Swedish food industry

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Key words: Quality, Total quality management, TQM, product, production, logistics, packaging, leadership and commitment, customer focus, communication, quality tools, supplier quality management, product design, process management, Deming, Juran, Feigenbaum, Crosby, Ishikawa, Taguchi

Purpose: The purpose with this paper is to examine the quality discussion in the Swedish food industry during the period 1960-2008 to see where in the chain the focus has been and whether the discussion has missed any important attributes related to the different components of TQM.

Methodology: The thesis is based on a qualitative method. The material studied was Swedish food industry magazines from 1960-2008. At a total 1500 individual magazines were covered coming from ten different industry magazines. Articles were categorized according to where in the industry chain the discussion took place. An additional categorization was then conducted to intertwine the empirical findings with the theories.

Theoretical perspectives: The main theory in focus is TQM, however to be able to apply theories during the research period underlying theories are used. This is because

TQM was not introduced until the late eighties. The underlying theories come from the most influential quality management gurus.

Conclusions: The authors found clear trends in the development of quality. In the 1960's the focus was on the process and defects were to be managed not eliminated. This changed over time, when the gurus and TQM got recognized. Quality then became a bigger concern, involving the whole organization and defects became something that was not going to be managed but eliminated.

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1. Introduction

1.1 Background

Quality within the Swedish food industry is a continuous occurring subject that involves everyone from the farmers and producers to the stores. Since the food industry involves dealing with fresh products the importance of logistics, packaging, storing are more important in this industry than in many others. In this industry quality is one of the big success factors. It is also the industry with most regulations on how to treat quality. The quality standards are continuously changing, not only from the legal aspects in the regulations but also from the customers' point of view because their perceptions and demands concerning quality are shifting along with trends and developments in the area. Developments in other countries and especially in the U.S. have been an inspiration for Swedish companies and will be described later in this thesis.

For many decades quality has been a frequent topic in the business world. But what is quality? Is it only the quality of the end product or is the production process also a part of what is considered good quality. When the everyday person talks about quality most often it is the end product or the customer based view that is discussed. This could be defined as "fitness of use" (Juran, 1951) or "to meet or exceed customer expectations" (Hoque, 2006). However, there are other ways of viewing quality. One is manufacturing based; Crosby defines it as "Quality means conformance to requirements" (Crosby, 1979). Another dimension is product based which can be viewed as "the amount of the unpriced attributes contained in each unit of the priced attribute" (Leifler, 1982). Quality can also be viewed as value-based which can be defined as "the degree of excellence at an acceptable price and the control of variability at an acceptable cost" (Broh, 1982). Lastly quality can also be viewed as transcendent, that is that it can't be defined but you know it when you see it (Pirsig, 1974).

Throughout the history these different views have influenced the discussion about quality. The mentioned definitions have derived from numerous management gurus in their development of theories to improve the quality standards and implementation in

the corporate world. These theories lie as a foundation for more modern quality theories such as lean production, Six Sigma and Total Quality Management (TQM).

In the food industry the basis of competition and the reputation of the companies lie in their ability to maintain and deliver products that meet and exceed the expectations of the customers. But how do companies achieve quality? As William A. Foster described it "Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skillful execution; it represents the wise choice of many alternatives" (Foster, 2006) which implicitly means that all aspects and persons of the organization needs to collaborate to attain quality. Hence quality is not achieved through a single action but through continuous efforts to improve the entire chain.

This paper will investigate what has been written about quality in Swedish food industry magazines since 1960 until today and examine how the discussion has changed over time. The authors will also attempt to locate where in the chain the discussion has been most frequent and connect this development to the different aspects of TQM.

The theory of TQM and its underlying theories will be applied in the study. Since many of the underlying theories were developed during our observation period we will see to which extent the discussion has followed these theories. Approaching quality within the Swedish food industry this way has not been done before and we hope to see what has been covered in the discussion about quality as well as what have been lacking. This leads up to the following thesis questions:

- Where in the Swedish food industry chain has the quality discussion been?
- Considering the theory of TQM, has some aspect of quality been emphasized in the Swedish food industry and have some been neglected in the discussion about quality?

1.2 Purpose

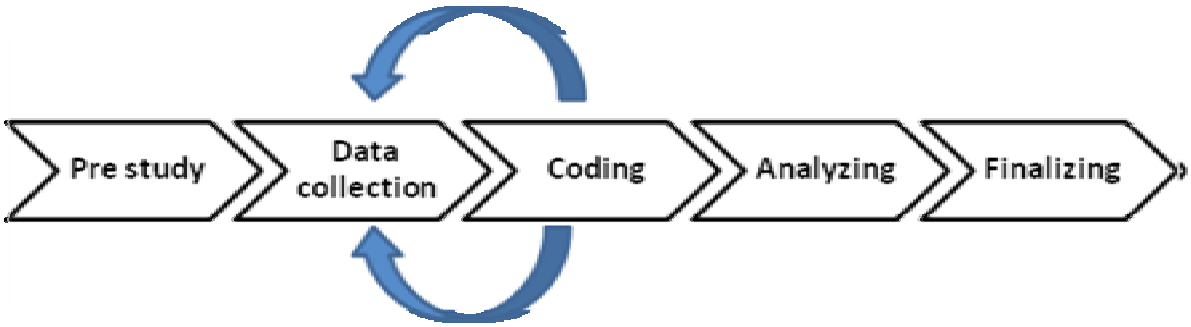
The purpose with this paper is to examine the quality discussion in the Swedish food industry during the period 1960-2008 to see where in the chain the focus has been and

whether the discussion has missed any important attributes related to the different components of TQM.

2. Methodology

2.1 Work process

The work process for this thesis was divided into five steps. The five steps were pre-study, data collection, coding, analyzing, and finalizing.



In the pre-study phase, theoretical literature and industry related material were reviewed to gain a broad knowledge of the industry and relevant theories about quality. From these theories, categories were constructed to cover the different aspects of quality within the production chain. These categories were thoroughly defined to mitigate problems with coding the findings of the data collection. All categories and definitions can be found in section “Categories”.

In the next phase, the data collection phase, industry magazines were located by searching in *LIBRIS* deldatabaser, *Nationalbibliografin*. During the time period that is to be researched, fourteen magazines were found. From these, a couple of samples of each were reviewed and ten magazines were chosen for a complete research. The ones discarded had a focus that was irrelevant to the research. A list of the studied magazines and reasons for discarding can be found in the section “Secondary sources”. During the process of reviewing the magazines the authors strived towards working together to be able to discuss questions that could arise. This also mitigated the risk of missing articles related to quality.

The authors had certain selection criteria on how to choose the articles. Firstly, the authors looked through the table of context to see which articles that could be treating quality. Most often the articles could be recognized by only looking at the title. The backside of this method is that sometimes the titles of articles are deceiving, therefore the authors in many cases had to make sure through quick peaks at the articles that the content corresponded to the title. However, when there was any doubts if the article could be about quality the authors read the article to see whether it was treating the subject. To be consistent a number of trigger words were used, they were: TQM, transport (transportation), förbättring (improvement), hygien (hygiene), säkerhet (safety), kvalitet (quality), logistik (logistics), teknologi (technology), produkt (product), produktion (production), process (process), and paketering (packaging). These words were not exclusively used as trigger words, similar words and also the context were used as determinants for including the articles.

In the coding phase, that took place during and after the data collection phase, the authors placed the articles in categories that were constructed in the pre study phase. After the completion of the data collection the authors looked through the findings and made sure the articles had been put in the right category. Once again the work was conducted together to enable the authors to discuss everything that might be unclear. To be able to apply TQM the articles were further divided into the TQM components. The additional categorization was combined with the initial categories to increase the depth of the analysis. The categories based on the TQM components can be found in section 3.8 Total Quality Management.

The next step was to analyze the data and use the theoretical framework developed to create an analytical solution. This was done by constructing tables using the two sets of categories. It allowed the authors to see what had been the focus in the quality discussion in the different steps of the production chain.

The final step was the finalization phase. This was aimed to conclude and evaluate the work. Here, the authors answered the initial thesis questions and purpose.

2.2 Research method

A qualitative method was the most suiting way of pursuing this research area, although some of our research is quantified to enhance our perception of the general trends of the debate concerning quality in the food industry. A qualitative method allowed the authors to use previous knowledge of what quality management is and apply it to the food industry by observing which parts of quality management has been highlighted in the debate. The study is qualitative in the sense that the authors make interpretations of general trends in the quality discussion (Alan Bryman, 2007). The authors also established an overview of how TQM has developed during the research period. This enables a comparison about the development in quality management theory and the quality discussion in the food industry.

2.3 Research approach

It is a deductive approach in that the discussion about quality in industry magazines are observed and categorized from a theoretical perspective. These findings will be analyzed and compared to the theoretical framework in order to come to conclusions about the awareness among the incumbents in the food industry (Alan Bryman, 2007). Thus, by observing the quality debate the authors hope to establish in what areas the quality chain has been in focus and in which has been overlooked. The theory section will enable the reader to reach an understanding of the development of quality management theories behind TQM, as well as the gains that quality improvements brings.

2.4 Secondary sources

2.4.1 Industry magazines

Secondary sources were used due to the research focus and also because the vast amount of material needed to reach a trustworthy conclusion. This gave a chance to create a good overlook of the overall trends regarding quality in the food industry.

The research period ranged from 1960 to 2008. The search for industry magazines was conducted in *Libris, Lovisa* and *Nationalbibliografin*, thus library catalogs were used to find out which magazines would fit into the research area. The keywords used were *"Livsmedel"("Foods")* in the free text section and *"Branschtidningar"("Industry magazines")* in the genre section. The criteria were that the magazines in question involved food products; were published during the research period and that they ranged at least 5 years.

In the search 14 magazines were found that seemed appropriate for the research purpose. Four magazines were discarded:

- Vår näring: föreningen Mjölkpropagandans tidskrift för husdjursskötsel mjölkhushållning och kostfrågor (Our Nutrition: the organization Milkpropagandas magazine for pets, milk economics and nutrition)
- Bröd: facktidskrift för bagare och konditorer (Bread: industry magazine for bakerers and pastery chefs)
- Information från Brödinstitutet (Information from the Bread Institute)
- Utmärkt: en tidning om matkvalitet (Excellent: a magazine about food quality)

These were discarded for different reasons, such as too few editions or the lack of relevant discussions about quality. *Vår näring* was discarded because much of the focus was on animal care. *Bröd: facktidskrift för bagare och konditorer* was discarded because it mainly concerned recipes for all sorts of bread. *Information från Brödinstitutet* had an inconvenient format for the research with several separate pieces, many covering recipes. *Utmärkt: en tidning om matkvalitet* was discarded because it was mainly concerned with the "goodness" of tastes of food. The remaining 10 magazines were:

- Livsmedel i fokus: teknik industri marknad (Foods in focus: technology, industry, market)
- Köttbranschen: svensk slakteri- och charkuteri-tidning: organ för Sveriges charkuteri- och slakteriidkares riksförbund (The Meat Industry: the swedish

abottoir- and charkuterie-magazine: and organ for the swedish abottoir- and charkuterie practicioners national organization)

- Livsmedelsteknik: industri, marknad (Food Technology: industry, market)
- Mat för millioner (Food for millions)
- Svenska mejeritidningen: SMT (The Swedish dairy magazine)
- Nordisk mejeriindustri (Nordic Dairy industry)
- Dagligvaruaffärer: öppnar dörrarna till dagligvarubranschen (Nondurables business: opens the doors to the nondurables business)
- ICA-kontakten (The ICA contact)
- Livs: SSLF-tidningen: facktidning/utgiven av Sveriges livsmedelshandlares förbund (Livs: SSLF-magazine: industry magazine/published by the Swedish grocery dealers organisation)
- Restaurang och Storkök (Restaurants and Large-scale cooking)

"Livs" and *"Daglivaruaffärer"*, *"Livsmedels teknik"* and *"Livsmedel I fokus"* and, *"Mat för millioner"* and*"Restaurang och storkök"* are the same magazines that changed names during the time studied.

Due to the time limit and amount of material accessible, the authors decided to go through every other year of the magazines so that more magazines and an extended time period could be examined. Investigating every other year would be sufficient for the purpose of noticing general trends in the quality discussion. Some magazines were given out weekly and some monthly. At a total, approximately 1500 magazines were covered.

Originally the authors attempted to read a magazine and write a comment about the general focus of the magazine from a quality aspect. The main concern was how to analyze and draw conclusions from all the information in the form of comments. Instead the authors decided to categorize the relevant articles to see where the general discussion landed. The trends would be noticed just by reading so many articles and by using the collected numbers one would be able to draw conclusions from this.

2.5 Categorizing

In categorization of the articles the first issue was how to categorize the different areas of quality in order to achieve a segmentation of which areas were in focus and which areas that were overlooked or simply ignored. It's important to know what the authors mean by quality in their selection process. In selecting the articles the authors have viewed quality as something affecting the products ability to meet all its expected requirements. This definition is based on Juran's "fitness for use", and Crosby's (1979) definition "conformance to requirements".

Categories were constructed to cover the aspects of quality in the theories. The originally formed categories had to be revised and finally four different categories were used. The criteria for an article to be included in one of the four categories were that the article discussed qualitative aspects within any of the categories. An important aspect in deciding upon the categories was that the categories were distinct and did not interfere with one another. Below definitions of the different categories can be found.

The categories used were: Product (raw-material and finished product), production (production process and production technology), logistics and packaging. Thus, product and production have two sub-categories because the broad scope of these two categories.

- **Product- raw materials:** Contains everything that effect quality of the raw materials used to produce the finished product. It involves such things as quality control of the raw material.
- **Product-finished product:** Everything that deals with the assurance of the quality of the finished product. This category involves control of the quality of the finished product, both public controls and self monitoring.
- **Production - Quality during the production:** Under the category production we have distinguished between two different types of production quality, the process and technology. The process is how the product is made and different aspects

around the process that could affect the quality such as waste, hygiene, personnel skills and work routines.

- **Production – Technology:** Is when new technology is developed and implemented in the production to improve the quality of the refined product. Here we have been clear not to include anything that concerns the efficiency.
- **Logistics:** This category contains discussions about the transportation raw materials and finished products. It also involves the handling and storage of the products and materials.
- **Packaging:** Contains all articles dealing with the packaging of the products and its effect on the quality.

Articles dealing with environmental aspects of production and the healthiness of the products have not been included if they it weren't directly related to the expected quality of the products. In the categories about production we found many articles dealing with increased productivity and efficiency. These were also excluded if they didn't at the same time deal with the effects on quality. Articles treating vegetables, fruit, potatoes and eggs were categorized in both categories product-raw materials and product-finished product.

2.6 Reliability and validity

In the process of writing a thesis it is important to consider the reliability and validity of the research. It is essential that the method used in fact investigated what it is supposed to and that the research is conducted in a reliable way. In this research approximately 1500 industry magazines have been examined in which relevant articles have been picked out and categorized. This screening process involves a subjective interpretation firstly of what quality involves (what affects quality) and secondly which area of quality is discussed. This has an impact of the reliability of the research and it is likely that if this research were to be conducted again all articles would not be placed in the same categories. However, due to the vast amount of material covered the authors still believe that the overall trends would be the same.

This thesis strives for examining the development of the discussion about quality in the Swedish food industry. To gain a profound understanding and to be able to reach well established conclusions the authors felt that it was important to cover a long period of time. Industry specific magazines are an important forum for any kind of discussion within an industry capturing what was important at the time. Thus, examining industry magazines allows for a historical research of the discussion about quality. As mentioned above this is an important forum for industry related questions but it is not the only one. It is therefore possible that some aspects have been covered through other forums than industry magazines.

3. Theory

3.1 Introduction

This thesis has a main focus on Total Quality Management (TQM). However, this concept is relatively new (first introduced in the 1980's) so the theories behind TQM will be deployed to see if the discussion from our empirical study follows the theories of the same time (Business Performance Improvments Resources, 2007).

The first question that comes up is what is quality? As discussed in the introduction chapter there are numerous ways of how to view quality. To be able to really understand where TQM comes from the roots from it have to be examined. There are a number of influential individuals that all have contributed to the development and the authors will go through the ones that they believe have been the most influential (Sanders, 2007).

3.2 William Edwards Deming

Deming is one of the most well known quality gurus. He defines quality as "satisfying the customer, not merely to meet his expectations, but to exceed them" (Zhang, 1997). He was a trained statistician and his focus was on improving products/services conformance to suit the market (Leadership Institute Inc., 2005). He said that variation was the cause of poor quality, and that there were two kinds of variation (Davis-Henke, 2007):

- Common cause variation; which is inherent in every process and system. Examples could be poor maintenance of machines, poor working conditions, quality control errors etc (Davis-Henke, 2007).
- Special cause variation; which is variation resulting from an assignable cause. Examples could be poor adjustment of equipment, machinery breakdowns, and a poor batch of raw materials (Davis-Henke, 2007).

Deming suggest that you attack special cause variation first and then you try to squeeze common cause variation. This is done by using SPC (statistical process control) charts. SPC charts are the basic cornerstone in Deming's approach to quality management. He believed that management was the main cause for poor quality; they are responsible for giving employees clear standards of what is acceptable as well as providing the methods to achieve it (Davis-Henke, 2007).

Deming is most known for his work in Japan, where many credits him as the person given rise to Japan as a manufacturing nation. Even though he had great success in Japan he stayed relatively unknown in the US until 1980 when NBC made a movie called "If Japan can- why can't we?". This movie was highly recognized and Deming was famous over a night. Juran said:"That videocast claimed that Japan's rise to economic superpower status was due principally to Deming's 1950 lectures in Japan" (Klefsjö, 2004). With his attention in the US he came in contact with the car manufacturer Ford. In the 1980's and early 1990's, he helped Ford to improve their quality problems (Cohen, 2004).

In 1982 he gave out the book "Out of the crisis". It was in this book he set out his 14 points on how to improve management and thus improve quality that became world famous (Institute for Manufacturing). Cohen (2004), summarizes the fourteen point as follows:

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move towards a single supplier for any one item, on a long-term relationship of loyalty and trust.

5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of an overhaul, as well as supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company.
9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets for the workforce asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.
11. a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.
    b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.
12. a. Remove barriers that rob the hourly paid worker of his right to pride in workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.
    b. Remove barriers that rob people in management and engineering of their right to pride in workmanship. This means, inter alia, abolishment of the annual or merit rating and management by objective.
13. Institute a vigorous program of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job (Institute for Manufacturing) .

These 14 points, Deming argued, could be applied to any organization, both service companies and manufacturing companies as well as small and large ones. Many of his ideas in the book “Out of the circle” are the central ideas in TQM. Deming never used the term but many credit him as the one launching the movement (Cohen, 2004).

3.3 Joseph Juran

Dr. Joseph Juran definition of quality was “fitness for use” (Juran, 1951). He argued that employees at different levels speak different languages. At operational level it was statistics and at top management level it was money (Davis-Henke, 2007). Just like Deming statistics was an important tool to attack quality problems but not everything, Juran mainly focused on managing for quality. In 1941 Juran discovered the work of Vilfredo Pareto, which he applied to quality. The Pareto principle, or the 80-20 rule, states that 80% of all problems come from 20% of the causes, and that management should focus on that 20% (Edmund, 2008).

Juran just like Deming, also contributed a great deal to the success of the Japanese manufacturing industry; it was his first edition of the “Quality control handbook” (1951) that opened the door for him into Japan. It was in this book his trilogy was first published (Edmund, 2008).

- Quality planning; Process of preparing to meet quality goals
- Quality control; Process of meeting goals during operations
- Quality improvements; Process of breaking through to unprecedented performance levels (Edmund, 2008).

Juran’s teaching led to another book in 1970, “Quality Planning and Analysis” co-authored with Frank Gryna. Just like the handbook this book turned out to be a bestseller (Sky Mark). Together with his trilogy Juran is most credited for adding the human aspect to quality management. He stressed the importance of education and training for managers. In his book “Managerial breakthrough” (1964) he argued that humans (resistance to change, cultural resistance) were the root cause of quality issues (American Society for Quality) . In 1979 he founded the Juran institute that today operates in almost every continent of the world.

3.4 Armand Feigenbaum

Feigenbaum defines quality as: “the total composite product and service characteristics of marketing, engineering, manufacture, and maintenance through which the product and service in use will meet the expectations of the customer” (Feigenbaum, Total Quality Control, 1991, p. 7). Armand Feigenbaum emphasized that quality is the responsibility of everyone in the organization, and that communication is the key to success (McKinsey& Company, 2007). Feigenbaum argues that communication between departments enables a greater scope of quality awareness. He also proposed increased control of product design, incoming material, and production in combination with increased communication; corporations would improve quality standards of products and processes (Davis-Henke, 2007). The Japanese embraced this concept and expanded it to “companywide quality control” (McKinsey& Company, 2007).

The now widely used concept of quality costs was introduced by Feigenbaum in his book *Total Quality Control*, 1951. Feigenbaum firmly underlines the importance of the cost of quality framework, and the measurements of where defects are detected. He proposed four classes of quality costs (Feigenbaum, Total Quality Control: 3rd Edition, 1991):

Quality cost classification:

- Prevention
- Appraisal
- Internal Failure
- External Failure

The main idea of this concept of quality costs is that prevention is to be preferred, and the earlier a defect is detected, the more beneficial it is for the company. A product that is discovered faulty in the hands of customers, that is in the external failure stage is far more costly due to recall costs and decreasing reputation (Feigenbaum, Total Quality Control: 3rd Edition, 1991).

In an article titled *How to Implement Total Quality Control*, Feigenbaum (1989) describes the difficulties of addressing quality needs. Since Feigenbaum has been CEO for his own company for many years he emphasizes the changing nature of cultures and especially how customers perceive quality. Before companies can meet the quality requirements of customers, Feigenbaum lists actions that need to be taken (Feigenbaum, How to implement total Quality Control, 1989):

- CEOs and COOs become the number one quality implementer, not the number one quality cheerleader.
- Chief financial officers apply their financial skills to evaluating a company´s cost of quality and help an organization to improve it instead of thinking of the next creative leveraged buyout financial technique.
- The title "Professor of Quality" joins the ranks of the finance and marketing professionals at leading business schools.
- Consumers' needs are addressed as quality becomes a fundamental way of managing a company (Feigenbaum, How to implement total Quality Control, 1989).

Further he discusses how companies need to understand the basic benchmarks of quality management if they hope to succeed in the implementation of a successful total quality control system (Feigenbaum, How to implement total Quality Control, 1989).

These benchmarks include:

- Quality is not a department but instead a systemic process that extends throughout the company.
- Quality must be organized and structured to support both the quality work of individuals as well as the quality teamwork among departments.
- Quality must be perceived in this process to be what the buyer says it is – not what an engineer or marketer or general manager says it is.

- Quality is an ethic, and widespread quality improvement is achieved only through participation from all the men and women throughout the company and its suppliers.
- Quality is a continuous process and one which will significantly grow as businesses realize that the key to their competitive advantage lies in the implementation of quality systems (Feigenbaum, How to implement total Quality Control, 1989).

Once a company understands the basic benchmarks of quality it is ready to undertake the necessary phases to implement a total quality control system – Analysis; Planning and Programming; and, Construction and Implementation. The Analysis phase establishes the current state of a company´s work processes and the possibilities for quality improvement. The Planning and Programming phase discusses the improvements of the problem areas found in the Analysis phase. In both these phases there is an enhanced emphasis on organization wide understanding and joined effort to succeed. The Construction and Implementation phase involves the "design, development, review, and implementation of the necessary improvements, integrated with existing organizational strengths into a complete system with measurements and controls" (Feigenbaum, How to implement total Quality Control, 1989).

3.5 Philip Crosby

Philip B. Crosby is considered a modernist in quality management. He defines quality as "conformance to requirements" (Crosby, 1979, p. 17). He worked his way through every rank of the corporation which gave him a broad insight into the possibilities of improvement in the field of quality. He was a modernist in the sense that he claimed that the benefit of the quality initiative will always outweigh its costs (Davis-Henke, 2007). His main contributions to the field were the notions of "Zero defects" and "Doing it right the first time" and his publication of Quality is Free in 1979. Mckenna (2001) wrote "the author of the seminal *Quality is Free* gained the attention of mainstream manufacturing executives with his straightforward, real-world approach to continuous improvement". The provoking title stand for how a company can always

continue to increase their quality in the entire chain without decreasing their margins. The first sentence of the book catches the essence in quite a remarkable way. It says: "Quality is free. It´s not a gift, but it is free. What costs money are the unquality things- all the actions that involve not doing jobs right the first time" (Crosby, 1979, p. 1). Crosby´s absolutes of quality management have been heavily utilized and have its origin in the *Quality is Free*. Crosby (1979, p. 131) writes "At this time it is a good idea to move right into the basics of quality. Help them understand what real quality means, emphasizing the absolutes of quality management". His absolutes of quality are:

- Quality means conformance, not elegance.
- There is no such thing as a quality problem.
- There is no such thing as the economics of quality; it is always cheaper to do the job right the first time.
- The only performance measurement is the cost of quality.
- The only performance standard is Zero Defects (Crosby, 1979).

Crosby suggest that there should be no allowable number of errors built into a product or process and unlike traditional quality control he considers acceptance of substandard products to indicate failure rather than assurance of success (Crosby, 1979). The books second part illustrates a program for companies to improve their quality approach called Quality Improvement Program. There are fourteen steps to the Quality Improvement program; these are (Crosby, 1979):

Step One: Management Commitment

Step Two: Quality Improvement Team

Step Three: Quality Measurement

Step Four: Cost of Quality Evaluation

Step Five: Quality Awareness

Step Six: Corrective Action

Step Seven: Establish an Ad Hoc Committee for the Zero Defects Program

Step Eight: Supervisor Training

Step Nine: Zero Defects Day

Step Ten: Goal Setting

Step Eleven: Error Cause Removal

Step Twelve: Recognition

Step Thirteen: Quality Councils

Step Fourteen: Do It Over Again (Crosby, 1979)

In 1979, Crosby also founded his "Quality College" in Florida. The same year he also started his consulting group Philip Crosby Associates. Due to the lagging standards of American manufacturers, especially in comparison to the Japanese, during the 1970s and 80s Crosby had an instant impact in the field of quality and thousands of managers have passed through his education forum in Florida (Fung, 1998).

3.6 Kaoru Ishikawa

Ishikawa is best known for developing the quality tool called cause-and-effect diagram, or fishbone diagram. This tool can be used to trace the cause of a problem to one or several specific causes (see figure 1). He also introduced the concept of the internal customer (employees), the next person in the production process. By considering this person as a customer, the company will gain continuous quality assurance throughout the production process. Further he stressed the importance of total quality control in the company and not just focusing on products and services. He suggested that for the efforts to be sustainable and successful they should be uniting all levels of the organization and making sure that they all shared a common vision and a common goal (Sanders, 2007).

Ishikawa is also credited for the concept of quality circles. Joel E. Ross and William C. Ross define quality circles as "a small group of employees doing similar or related work who meet regularly to identify, analyze, and solve product-quality and production problems and to improve general operations. The circle is a relatively autonomous unit (ideally about ten workers), usually led by a supervisor or a senior worker and organized as a work unit." Ishikawa first introduced it 1962 and in the middle of the 90's it had been used by thousands of organizations around the world (Small Business Encyclopedia).

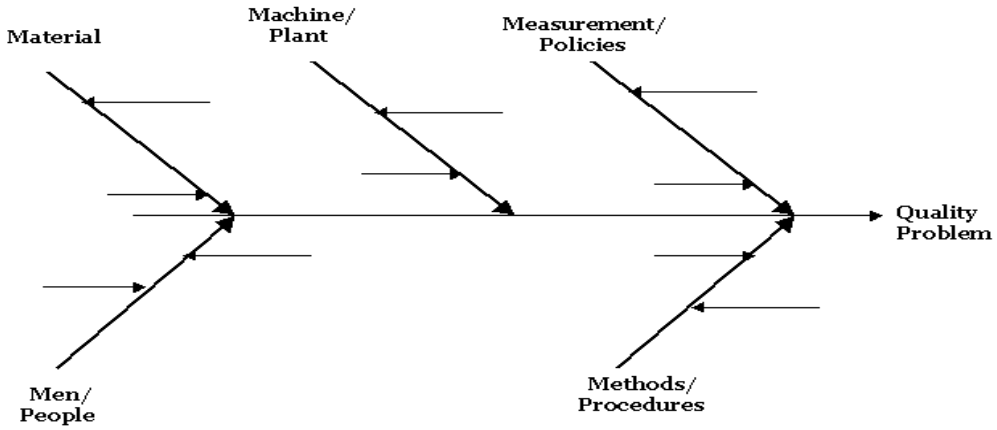


Figure 1: Cause-and-effect diagram (Armstrong, 2008)

Ishikawa has also been associated with the development of the seven Quality Control tools that are often used in TQM. The tools are the following:

- Process flow chart;
- Check sheet;
- Histogram;
- Pareto chart;
- Cause - effect diagram (Ishikawa diagram);
- Scatter diagram;
- Control chart (Sanders, 2007).

3.7 Genishi Taguchi

Taguchi defines quality as “the quality of a product is the minimum loss imparted by the product to the society from the time the product is shipped” (Resit Unal, 1991). Taguchi estimated that 80 % of all defective items are caused by poor product design, which was his area of focus. Thus, he suggested that this is where companies should focus their quality efforts. This stage has the advantage of being easier to change compared to later stages in the production process (American Society for Quality). Taguchi applied a method called *design of experiment* to the design of products. The idea was to design products that could function in a wide range of environments. This was done because designing such a product is easier than controlling the environmental conditions (Sanders, 2007).

Taguchi has contributed a lot to today’s view of the cost of quality. In the traditional view of conformance to specifications a target value for the product is set with a specific tolerance level of deviation. Losses occur when the product falls outside of the specified limits. According to Taguchi, being just inside or being just outside the limits makes little difference from a customer perspective. Therefore he stated that the smaller deviation from the target value the better the quality. Based on this he proposed that as conformance values move away from the target, the loss increases as a quadratic function. This is called Taguchi’s loss function and has had a strong impact in changing the views on quality costs (Sanders, 2007).

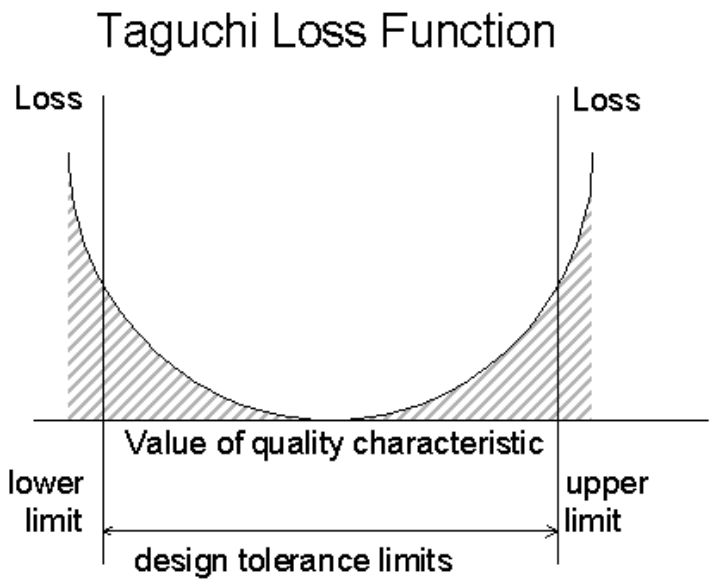


Figure 2: Taguchi loss function (Quality assurance, 2000)

3.8 Total quality management

Together all these so called "gurus" theories have influenced the development of TQM. What characterizes TQM is that it tries to indentify the root cause of the quality problem, as opposed to inspecting after it has been produced. The whole organization is involved in TQM, and it views quality as customer driven (Fung, 1998). Below is a

Deming	Emphasized management's responsibility for quality 14 points to improve quality
Juran	Quality trilogy Defined quality as "fitness for use"
Feigenbaum	Introduced concept Costs of quality Introduced concept of total quality control
Crosby	Five absolutes of quality Introduced concept of "zero defects" and "quality is free"
Ishikawa	Cause- and effect diagram Developed concept of the internal customer Seven quality tools Quality circles
Taguchi	Product design

summary of the main thoughts of the gurus discussed in the previous sections.

When the first "gurus" started in the 1940's and 50's the main focus was on statistical tools to evaluate quality. Such as statistical process control charts were used to monitor the production. Deming, Juran and Feigenbaum had great success in Japan which made quality a very important topic to Japanese companies. This led to new gurus like Ishikawa and Taguchi who both expanded old theories and developed their own.

In the 1960's when the gurus started to get recognition the focus turned more to a whole organizational issue. That is, not only the production process was the cause of quality problems. This view was further developed and in late 1970's the view of quality took a new sharp turn. The main reason was the success of the Japanese companies that started to increase their market shares in the US market. They were able to produce high quality products to a low price which US manufacturing firms couldn't. This led to the wave of hiring quality consultants to help the US companies. People like Deming, Juran and Ishikawa helped companies like IBM, Ford, and Xerox. The meaning of quality became

Table 1: Summary of the gurus' main contributions

a greater concern and took a more strategic meaning. Companies viewed quality as a potential competitive advantage, where the customers were put first and the definition "meeting or exceeding customer expectations" became a common definition of quality. This new wave of quality focus was going to be called TQM which is a term for a broad spectrum of quality tools, techniques, programs and strategies deriving from the "gurus". Below a summary of the main components of TQM are listed:

- Leadership and commitment; is a critical role of quality management. As we have seen in the previous sections, Deming, Juran, and Crosby stresses the importance of good management. To implement TQM in an organization top management have to believe in it, they have to be committed to it. Lack of managerial commitment is one of the reasons for the failure of TQM (Brown, 1994).
- Customer focus; Taking care of customers both the external and the internal (the employees) are crucial for quality management. The UK department of trade and Industry writes "Failure to meet the requirements in any part of a quality chain

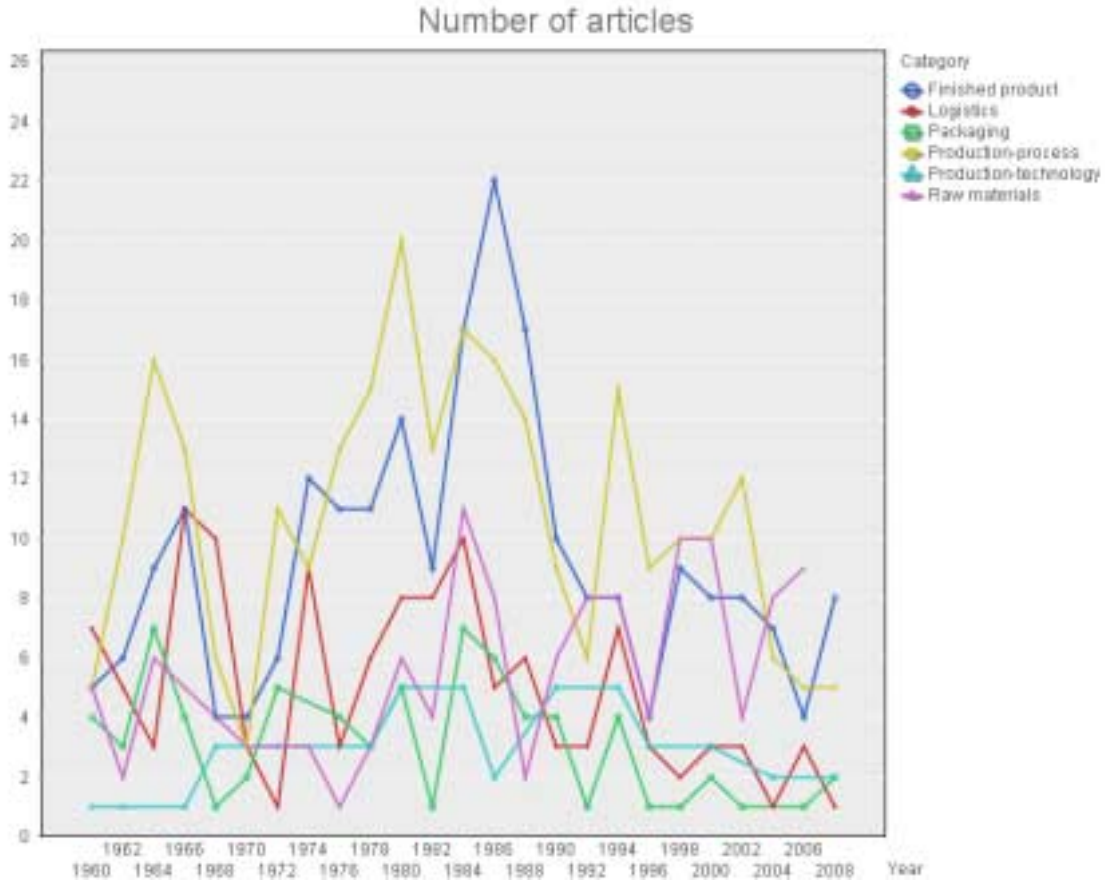
has a way of multiplying, and failure in one part of the system creates problems elsewhere, leading to yet more failure and problems, and so the situation is exacerbated" (Department of Trade and Industry).

- Communication is another important part of succeeding with TQM. Managers must be able to communicate well to the employees about how things should be done. As Juran says, the language spoken at an organization is different between managers and workers which make it harder to communicate. It's very important that the language spoken at all levels are understood by everyone in the organization. (Padhi, 2005)
- Use of quality tools; are important to be able to measure and improve quality (Sanders, 2007). Ishikawa identified seven tools he believed were supposed to be used. If they are to be used correctly training and education is needed, which is stressed by many of the gurus.
- Supplier quality management; is also an important element of a successful TQM. This is because materials and purchased parts are often a major reason for quality problems (Flynn, 1994). Deming suggests that instead of focusing solely on price; try to develop a relationship with your supplier and work together to build quality. He further says that this should be done by focusing on a few suppliers instead of many.
- Product design; products need to be designed to meet customer expectations. This is what Taguchi said; he estimated that 80% of poor quality was due to poor product design. However, it is hard to know what customer wants, since every customer is different. Therefore, to produce the right products, one needs to translate the language of the customers to more specific technical requirements (Sanders, 2007).
- Process management; means that quality should be built into a process (Sanders, 2007). Everything is a process, the transformation of inputs to a final product that should satisfy the customers' needs and expectations. Process management focuses on managing the manufacturing process as it is expected. That is, without breakdowns, missing materials and so on (Zhang, 1997).

4. Empirical results

4.1 Introduction

The authors have gone through 48 years of empirical data, starting from 1960 until 2008. The total magazines covered were approximately 1500 distributed over nine different industry magazines. The total number of relevant articles found was 870. Below is a graph showing the development of the quality discussion based on the authors' categorization. The authors will also present a summary of the magazines covered to enable the reader to understand the different parts of the industry chain covered in the research.



Graph 1: Overall development of the quality discussion

4.2 Industry magazines

ICA-kontakten is a company magazine who is first hand directed towards the issues that involve that particular company and its employees. Due to this there is a great deal of articles that are irrelevant from a quality point of view. On the other hand, because Ica is in the heart of the Swedish food industry the authors deemed the importance of the magazine. The focus of the magazine was skewed towards finished products since ICA is a retailer. *ICA-kontakten* was given out from 1965-1995. The total number of relevant articles found was 49.

The food industry is a large and dynamic area. Development happens quickly. *Livsmedelsteknik* is a way for the involved business people to stay informed. The magazine covers both breadth and depth of the technological developments, both mechanical improvements as well as new product compositions. The magazine is now given out nine times a year. This is a magazine that has a focus on the whole industry chain, from raw materials to retailers. The magazine was given out between the years 1960-2008. At a total 248 relevant articles was found. As described above this magazine has a broad focus, which is one reason why the high percentage of relevant articles found relatively spread out between all our categories.

Mat för Millioner was given out from 1969-1981 and then switched name to *Restauranger & Storkök* which is still given out. The focus of the magazines lies within the restaurant business and their concerns. A fairly wide spectra is covered, everything from distribution and handling of supplies to cooking devices for improved end products to customers. Since the restaurant business is a fast changing businesses, the many trends are covered within areas such as design, food and beverages. The authors found 58 relevant articles. Just by looking at these figures it is obvious that the focus of the magazine did not lie in the heart of our area of study.

Svenska Mejeritidningen was given out from 1909 until 1978 when it switched name to *Nordisk Mejeriindustri* which was given out until 1996. The magazine describes all aspects of the milk production and distribution process. Everything is covered from the

actual milking of the cow to the transportation and handling of the milk packages. Obviously the input, the cow milk, and the necessary added substances to increase the durability and freshness are highlighted. Especially during the earlier editions the inputs effect on durability and efforts to decrease volatility of the fat content were in focus. The authors found 220 relevant articles in these magazines.

The magazine *Köttbranschen* covers information regarding the meat and-charcuterie industry. It reports on different developments in the industry and reports from fairs and meetings among incumbents in the business. The magazine has been published during the whole period that has been studied which gives a good overview over the period. In these magazines 190 articles were found that were related to quality. The total distribution of the results found can be seen in the chart below.

Dagligvaruaffärer has been published since 1994. Before that, the name was *Livs* which was given out during the period 1964-1994. The magazine has a more general focus and covers a broad spectrum of subjects within the food industry. In the research of the magazine the period 1964-2000 was covered. In these, 105 relevant articles were found.

5. Analysis

5.1 Introduction

The analysis will be divided into two different parts. Firstly an analysis of the overall trends in the food industry will be conducted and compared to major events related to the field to see whether they might have had an impact on our empirical results. Here the focus lies on the initial categories. After that the empirical data will be analyzed by implementing the TQM components. This will be done by categorizing all the articles into the TQM components:

- Leadership and commitment
- Customer focus
- Communication
- Quality tools
- Supplier Quality Management
- Product design
- Process Management

The authors will break down the analysis into decades to see more in detail how the discussion about quality has developed over time. Further, this will enable the authors to see where the major focus has been as well as what has been missing.

5.2 Analysis of empirical results

5.2.1 Overall analysis

By looking at graph 1 there are some general trends that can be drawn from it. Starting in the 60's the authors' impression is that the U.S. has been a great source of inspiration and admiration. This impression of the interrelationship between the quality discussion

in Sweden and the implementations of theoretical concepts in the U.S. can be further seen in the success of the quality concept introduced in Ford by Deming in the early 80's and the upswing in relevant articles in Sweden for the same period. Further, the peak in the early 80's the authors also believe can be explained by the world's focus on quality that increased, with the US in the front row. The term TQM was first used during this period which also can have influenced the upswing in relevant articles.

Looking at the category "raw materials" one can see some interesting trends. In the mid 90's when the mad- cow disease (BSE) got a lot of attention, the quality discussion increased in this category. The same can be seen when foot - and - mouth disease and bird flu came in the early 2000's (Reynolds, 1999).

In category "logistics" as the authors defines as "the discussion about the transportation of raw materials and finished products. It also involves the handling and storage of the products and materials", one can see a dramatic increase around 1973 when the oil crisis occurred. This is interesting to see because after the 1973 crises it went down before increasing again in late 70's when the second oil/energy crisis occurred.

One can also see that the main focus about quality has been around what the authors call "finished product" and "production process". The immense focus on finished product contradicts what Feigenbaum suggests that prevention is the cheapest way to avoid poor quality. To show the development of TQM as well as major events that have occurred, a timeline is shown below in figure 3.

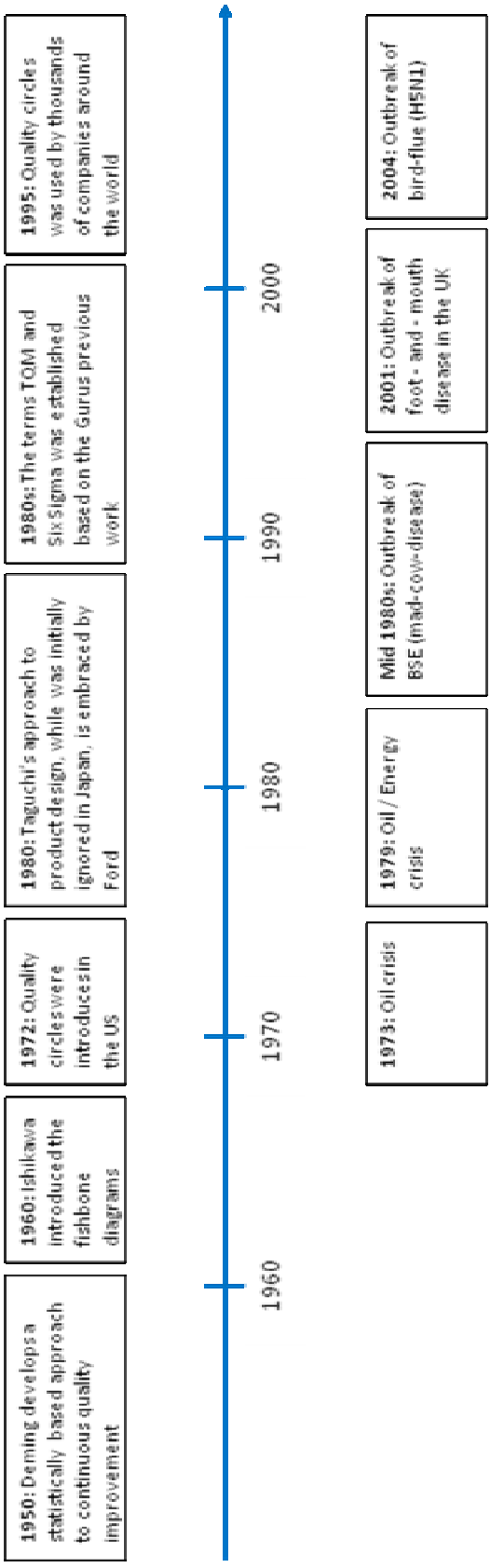


Figure 3: Timeline

In the following section the authors will dive into the depths of quality and conduct more specific analyses over each of the five decades. By implementing the TQM concepts into the already established categories, another dimension has been added for improved comprehension.

5.2.2 Analysis per decade

This section of the analysis will include tables which will illustrate the empirical findings in two ways. The vertical way shows where in the chain the most articles have been found. The horizontal way shows which focus from a TQM perspective the found articles had. The authors will mainly look horizontally and then look into the intersections.

The authors would like to point out that the definitions of process management and production process are similar which naturally result in a large number of articles in the intersection of the two, which makes the tables slightly skewed.

5.2.2.1 1960-1969

	Raw-materials	**Finished product**	**Production process**	**Production technology**	**Logistics**	**Packaging**	
Leadership and commitment	2	6	6	0	1	0	15
Customer focus	1	16	2	0	0	0	19
Communication	1	6	6	0	2	0	15
Use of quality tools	6	14	6	0	0	0	26
Supplier quality management	6	1	0	0	2	0	9
Product design	3	7	17	5	6	18	56
Process management	2	6	25	1	29	1	64
	21	56	62	6	40	19	

Table 2: 1960-1969

The general consensus of this time said that quality dips were inevitable and volatility was to be managed and not eliminated. Because of the assumed differing standards of quality, the main focus is on process management and product design. The focus on process management can be related to Juran´s quality trilogy (1951) which discusses

quality planning, quality control and quality improvements. In the 60s' process management was developed through much learning of how different handling areas and temperatures affected the food. The industry also continuously improved the conservation of fresh foods through increased knowledge of added substances and the effects of these. Experimentation of deep freezing food products for longer conservation periods had a great impact on the industry.

Product design in focus can be related to the concept of prevention. Planning and designing products which are less likely to result in defects, creates a less costly production line. Compared with finding defects in later stages, prevention is superior in the way that defects are less likely inherently. Crosby was also a proponent of prevention but took it to a more extreme with his "zero defects" philosophy which took sort of an aim for the stars and land on the moon approach. He argued that no errors should be built into the product design and hence would radically lower defects. The concept of product design was later further developed by Taguchi who estimated that 80 % of quality problems were caused by poor product design.

The largest figure within product design is packaging. The form of packaging for many products such as milk was during this period subject for development; therefore many articles covered these issues. Especially going from glass bottles to paper packages in milk production and the pros and cons of the alternatives was discussed. The second largest figure in production design is production process. The developments in product research and new findings of causes to the mentioned volatility were major reasons for the production design/production process figure.

The largest intersection in the table is between process management and logistics. This involves hygiene, storing and handling of especially fresh food products which were an intensely discussed area and a special interest was also paid to the transportation of fruits etc from distant countries. Because the constant developments of enhanced transportation storage possibilities, the interest was more in being able to provide certain products that had not been provided before. Therefore the discussion was in many cases not putting the quality standards in a favorable light.

Use of quality tools is the next area of focus. Especially the intersection with finished products is interesting. As shown in the table the center of attention is upon the quality control on finished products instead of control of products in the process. According to Feigenbaum this is a weakness because defective products usually cost a lot more if found later in the process. Hence the cost of quality increases with this distribution.

5.2.2.2 1970-1979

	Raw-materials	Finished product	Production-process	Production technology	Logistics	Packaging	
Leadership and commitment	3	6	4	1	0	1	15
Customer focus	2	22	5	0	3	0	32
Communication	2	14	6	1	3	0	26
Use of quality tools	5	13	8	0	2	1	29
Supplier quality management	3	2	2	1	2	0	10
Product design	2	5	8	3	3	13	34
Process management	3	1	32	1	14	2	53
	20	63	65	7	27	17	

Table 3: 1970-1979

The quality discussion in the 1970´s took a slightly broader approach compared to the 1960´s. During this decade process management was still the dominant factor, followed by product design and customer focus. Together they make up 78 % of the quality discussion.

Within process management, an interesting note is that production-process is going from being an important subject in the 60´s into being the primary focus and reaching 60% of the attention of the discussion. The focus on building quality into the process was an immense factor continuing from the 60's relating to Juran's trilogy. A frequent topic was the discussion about waste and how that could be lessened, which is related to the second step in the trilogy called quality control.

Logistics which is the second largest category within process-management is high due to the debate over how to distribute and transport products and maintain the highest quality possible. The concept of freezing and conserving that was discussed in the 60s is

fine tuned. An example was that meat exports would be lost if the temperature in the abattoir was too high.

Within the discussion about product design most articles dealt with packaging which could be considered natural since the packaging has a great impact on the features of the product. It is interesting to note that product design decreased in comparison to the 1960´s. It also seems that the attention has turned away from product design towards TQM areas such as customer focus and communication. The importance of marketing and putting the customer in the first room is one of the explanations to the customer orientation. By providing information about durability and quality, the perceived quality from the customer's point of view was increased, hence the increase in customer focus. When it comes to communication, the discussion hovered around information to and among employees about the expectations around quality and how everyone could facilitate higher levels of quality.

Looking vertically, an interesting observation is that the category dealing with raw materials has an even distribution over the theoretical framework suggesting that the discussion has actually covered most aspect of TQM. This could be explained by the authors covering different industry magazines with focus on different parts of the industry chain, as explained in the empirical section. One could assume that the producers, and butchers that were in focus on those magazines had reached further in the quality aspect, thus seeing quality as an organizational issue and not as a single activity.

Again looking vertically, none of the articles studied dealt with supplier quality management within packaging. One possible reason for this might be the fact that Tetra Pack has a very dominant position on the Swedish dairy market. One could suggest that this could lead to a feeling that the main supplier is given, thus managing relations to your suppliers is not necessary.

Production technology has not been a frequently discussed topic in the industry magazines during the 1970s. However, the food industry can hardly be considered a

high tech industry thus this might be completely natural. In the area of production the main focus seems to have been put on the production process.

5.2.2.3 1980-1989

	Raw-materials	Finished product	Production process	Production technology	Logistics	Packaging	
Leadership and commitment	4	12	10	3	3	4	36
Customer focus	9	41	12	4	8	8	82
Communication	6	27	13	4	5	3	58
Use of quality tools	10	21	22	3	3	2	61
Supplier quality management	9	12	4	3	9	3	40
Product design	10	20	20	6	8	14	78
Process management	7	10	27	4	23	5	76
	55	143	108	27	59	39	

Table 4: 1980-1989

The 1980's was the most exciting decade of the study from the research point of view and was also the decade where the most articles were found. Compared to the 60's and 70's the distribution between the different TQM components are not as disperse with the exception of leadership, which again doesn't get very much attention. One could see a tendency from the 70's that quality is more of a whole organizational issue which is strengthened more in the 80's. The relatively closer dispersion can be explained by Deming got recognition outside Japan, as well as TQM was becoming a force to count with.

Another interesting aspect during the eighties was that "customer focus" was the most common category which was not the case in the 60's and 70's. Customer focus includes both the internal customers and the external customers. Ishikawa stressed the importance of the internal customer; he argued that by considering this person as a customer the company would gain continuous quality assurance throughout the production process. This is reinforced by looking at the interception customer focus and production process which is the second largest category within customer focus.

Focusing on the external customer is something that all the gurus' stress as very important due to the fact that delivering poor quality to the customer is much more expensive than detecting it before, as Feigenbaum discuss with his cost of quality. This can be seen by looking at customer-focus, finished product in the table 3, where 50% of all found articles within customer focus are.

The second biggest intersection in table 3 is communication, finished product. Within communication, finished product has been the most frequent in all the previous decades. This might indicate that the focus of communication is not in the right place according to the gurus and TQM. TQM says that communication between managers and workers are the key to successful quality management since they often speak different languages which suggest that communication in the process should be highly beneficial.

Earlier the authors noticed that there was a debate about waste related to the handling of foods and further there was more focus on the issue than on the solution. In the 1980s on the other hand, the waste discussion changed its focus to being more toward solving the issue through special handling etc.

5.2.2.4 1990-1999

	Raw-materials	**Finished product**	**Production process**	**Production technology**	**Logistics**	**Packaging**	
Leadership and commitment	0	8	14	2	2	1	27
Customer focus	3	14	3	1	1	3	25
Communication	3	9	1	2	1	0	16
Use of quality tools	7	13	11	3	1	2	37
Supplier quality management	8	6	0	0	1	2	17
Product design	14	13	10	5	4	4	50
Process management	9	9	22	5	8	2	55
	44	72	61	18	18	14	

Table 5: 1990-1999

In the middle of the 1990's Sweden joined the European Union which had an instant impact on the Swedish food industry in the form of higher demands on quality of products and production processes. Many demands came in the shape of rules and

standards concerning quality of products but also concerning transparency and origin. Another effect was an increased competition for the companies in the Swedish food industry. After entering EU exports increased which is an upside but at the same time margins have decreased in industries that were protected before such as the meat and the dairy industry ((Livsmedelsekonomiska institutet, 2008). In graph 1, one can see in an increase in the discussion about production process starting in 1994 even though the general trend is decreasing. This could be a sign of preparation for the expected change in rules and standards concerning quality.

As mentioned above the concept of TQM was introduced in the 80s' and a large intensification of the discussion could be seen. This led to an increase in all categories. During the 90s' one continues to see an even distribution over the theoretical categories that were first recognized in the 80s. Following the introduction of TQM, leadership and commitment is receiving more attention and it seems as an organizational view of quality is getting implemented. It is interesting to see that the largest part of the discussion about leadership and commitment is within production process which among other things includes training and education of management and employees. This was not the case in the 80s where leadership and commitment was more focused towards the finished products. This together with the strong focus on process management where quality is being built into the processes of the organization could imply a spread of the quality mentality among the participants of the entire organization.

The second most frequently occurring subject in the discussion was about product design. This category has also seen a decrease compared to the 80s but relatively it's still one of the most important ones. In the beginning of the 80s Taguchi's thoughts about product design started to get recognition and were adopted by e.g. Ford. This fact could be a contributing factor to product design still being an important aspect. However, one can see a shift in the focus of product design. Earlier the focus was distributed among finished product and production process. Now the focus has shifted to be more directed towards raw materials. Taguchi suggested that products should be designed to function in a variety of environments and in the food industry this is best achieved by focusing on the raw materials. This focus on product design in raw

materials could also be linked to Feigenbaum's thoughts about quality costs where he suggests that preventing faults from occurring will always be superior to finding them at a later stage. It is also interesting to note that at the same time Europe saw an outbreak of mad cow disease which got a lot of attention in the media and further intensified the discussion about quality and primarily quality within raw materials.

Leadership and commitment which is a cornerstone in the TQM concept has also seen a shift in focus. During the 80s leadership and commitment was relatively evenly distributed over the categories with an emphasis on finished product. In the 90s a shift towards leadership and commitment in production process can be seen. A closer examination of the content of the articles within this category shows an enhanced focus on education and training of employees as well as discussions about controls of the quality of the processes in the production.

The drastic downturn in customer focus can have its explanation in the competition argument that the customer perspective is the assumed priority among the incumbents in the industry. Thus the quality discussion is based on these assumptions about the customer priority and is not the main focus.

5.2.2.5 2000-2008

	Raw-materials	Finished product	Production process	Production technology	Logistics	Packaging	
Leadership and commitment	3	7	6	1	2	0	19
Customer focus	3	12	3	1	0	1	20
Communication	5	6	4	1	1	0	17
Use of quality tools	7	7	5	1	0	0	20
Supplier quality management	5	1	2	1	2	0	11
Product design	11	6	13	3	0	2	35
Process management	2	6	12	4	6	3	33
	36	45	45	12	11	6	

Table 6: 2000-2008

In the 2000's one can see that quality is continuing to be a more organizational concern than what one have seen in the 80's and 90's. This can be seen by the even distribution over the horizontal categories. Just like the other decades supplier management is not frequently discussed even though a small increase can be seen. One of the most interesting notes in the 2000's is that the focus on product design within raw materials continues to get more attention relative to finished products and production process. This might be explained by bird flu, and foot and mouth disease that came in early 2000's.

The authors perceive that traceability means a lot to the modern customer. The people who are concerned about such things as the environment and origin of products expect to be able to tell by the package where the product comes from and how it is grown. It is crucial that companies comply with the desires of the customers in order to meet and exceed the demands of the customers. This can be related to Crosby´s slightly extreme argument that quality is free in the sense that the benefits of improving quality will always outweigh the costs. Consider the example with the making sure that the marking on the products is accurate. If a customer finds out that a product is marked wrong, then the cost will be immensely higher than the costs of the employee's checking the accuracy of the marking. This is reflected in the intersection between customer focus and finished products.

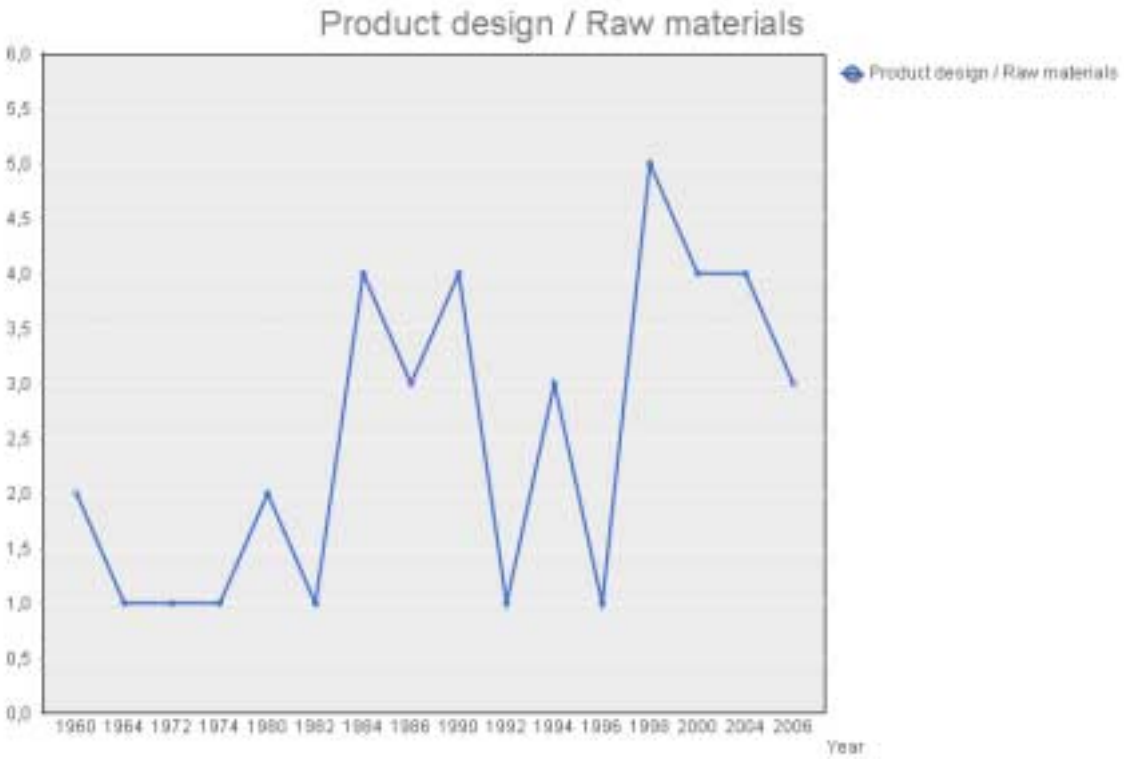
A clear decline in the total amount of articles relevant for our study can be seen during this period. A possible cause for this could be that products of high quality might be taken for granted by both customers and companies and thus the discussion might have been somewhat forgotten. An explanation can be that a great deal of implementation of TQM and other quality assurance systems during the 80s and 90s have left companies with better processes for quality control. Also media appears to play a major role in the control of the food industry and their products. If a products do not reach up to par with what is promised then the companies are played out as the bad guys, which in turn cost companies a great deal of money.

5.2.3 Summary

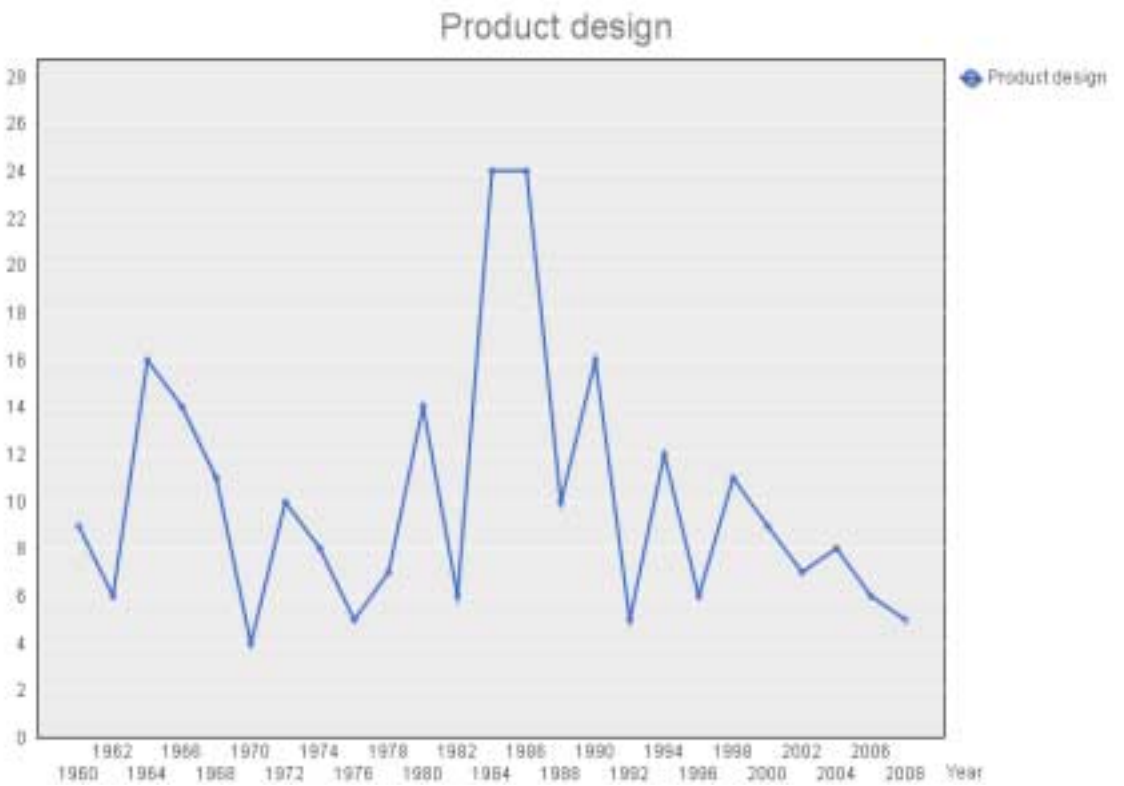
	Raw-materials	Finished product	Production process	Production technology	Logistics	Packaging	
Leadership and commitment	12	39	40	7	8	6	112
Customer focus	18	105	25	6	12	12	178
Communication	17	62	30	8	12	3	132
Use of quality tools	35	68	52	7	6	5	173
Supplier quality management	31	22	8	5	16	5	87
Product design	40	51	68	22	21	51	253
Process management	22	32	118	15	80	13	280
	175	379	341	70	155	95	

Table 7: 1960-2008

The quality discussion for the past five decades has had an interesting development. In 1960's the main focus was on process management and on product design. This changed over the time due to the fact that quality became a bigger ingredient to success as well as quality theories were further developed. The transition can be seen in the



Graph 2: Product design / Raw materials



Graph 3: Product design

previous sections which illustrate a development where quality has taken a broader perspective, including every part of the organization to a wider extent. The result or a wider perspective is decreasing importance of product design and process management. Although the general importance of product design is decreasing, it's interesting to note that raw materials within product design have gone in the opposite direction which can be seen in graph 2. As described earlier this could be due to several incidents such as mad-cow disease and bird flu. Thus one can conclude since raw materials have been increasing the other categories within product design has decreased substantially more. Graph 3 shows the development of product design.

The same pattern can be seen in process management, where raw materials have gone the opposite direction compared to the whole category. This could be because the industry has realized that the earlier the poor quality is detected the cheaper it is for them, as Feigenbaum argues in his costs of quality.

The broader perspective of quality can be seen clearly for the first time in the 1980's when the concept TQM was first introduced. This is illustrated in table 4 which covers

the 1980´s and includes the most relevant articles of all the decades. However, two categories supplier management and leadership have throughout the period not been as common as the other categories. Deming suggests in his fourteen points that supplier relationship is essential to good quality. As can be seen in table 6, supplier quality management only makes up a third of the articles found compared to product design and process management. The reason suppler quality management being so low can be that food industry is using very many suppliers and according to TQM and Deming it's better to focus on a few and create a good relationship between those, which will improve quality.

The low number of articles in leadership and commitment is completely the opposite of what Deming, Juran and Crosby says. They argue that good leadership and management is one of the most essential ingredients to have continuously good quality. The reason for this is hard to explain; maybe it's just that it is something that is not just written about in the type of magazines that were in focus or that there is a shortage of good leadership in the industry.

6. Conclusion

During this study the authors have discovered several themes and trends within in the Swedish food industry. The initial purpose of this study was to see the trends of the quality discussion in Sweden since the 1960's and where in the chain the focus has been as well if the discussion has missed any important attributes. The authors' categories finished products and production process was the most prevalent all through the research period. Production-technology and packaging were the least mentioned categories.

Overall the most evident trend is that quality has become a bigger concern for all parts of the organization which goes in line with the TQM concept. This trend started in the 80s which is when TQM got its breakthrough. The authors also noticed that it was in this period the quality discussion was most intense. The most common TQM components in the study were process management, product design, and customer focus. However, based on TQM there is particular one component that has been missing to a larger extent which is supplier quality management.

The authors have also seen a correlation between major events such as the oil crisis and bird-flu to the discussion about quality in that particular area. That is, the discussion has increased when an event has happened that could affect the industry.

On a last note, quality management has made a great contribution both to the quality of products but also to the satisfaction of customers. It will always be important to deliver quality products, especially in the food industry. Therefore, the authors would like to finish with a quote by Phillips-Donaldson (2005) who stated: "No matter what, quality will keep on rockin".

7. Authors' reflections

To conclude this study some insights will be shown to create possibilities for further research and debate around this area. These insights will be connected to more recent events and trends such as the financial crisis, the chicken package incident, the "health obsession", the information society and the more competitive environment due to Sweden's entrance into the European Union to give a modern perspective.

An interesting observation is that in the current financial crisis many companies in Sweden turn to layoffs as a mean to lower costs. If one considers the foundations of quality which states that improved quality leads to decreased costs due to lower recalls and waste, the layoff argument can be questioned. To maintain a high standard of quality, the whole organization needs to be communicating and striving in the same direction. Consider a worker is laid off, does the cost saving compensate enough comparing to this workers experience and perception of "knowing quality when he/she sees it". One less material handling worker would likely lead to more time pressure and hence increased amounts of defective products. This would be something that the authors believe would be interesting to investigate. Thus, how do layoffs affect quality?

Another recent incident is the glass in the chicken packages that occurred in the beginning of 2009. If the company in question had continuously worked on implementing a "quality mentality", then the workers involved would take pride in the quality of the chicken and maybe be more likely to detect the defective products before they reached the customer. This would have stopped a scandal and greatly decreased the costs of quality. In this case there seems to have been sabotage involved, probably from an unhappy worker. This can be related to the concept of leadership or rather the lack thereof. As can be seen in the study, the lack of discussion regarding leadership suggests that there might be a need for improvement. Which leads to the question: how does leadership affect quality?

The health conscious hype has grown along with the increased access to information and the effects of certain eating habits. These health conscious customers have probably

a different perception of what quality is and how to define it. This type of consumer probably perceives a product that is considered healthy a product of high quality. Thus articles about healthy products have increased which lies outside the scope of this study. However, in today's environment there is a fine line between what is considered healthy and quality. This lead to the question: is a healthy product equal a quality product?

8. Appendices

8.1 List of figures

8.2 List of tables

8.3 List of graphs

9. Bibliography

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