Introduction
Scandstick AB is a laminator in the label industry. The company is in an expanding phase, characterized by large investments and organizational changes. The introduction of new machinery has resulted in a backlog and a declining product quality, due to an increased amount of shipped goods. This procedure has resulted in an increased number of customer complaints that demands a significant amount of the company’s resources.

Purpose
The purpose of this master’s thesis can be divided into two separate parts:
To trigger an interest in costs of poor quality at Scandstick and how these costs can be reduced through proactive work within the field of quality, but also how this work can be evaluated and connected to the bonus wage at Scandstick

To increase the understanding of the difficulties and opportunities that arise when deciding the structure of the semi-manufactured stocks in storage.

Problem statement
With reference to the background and purpose of the thesis the problem statement is:

How should Scandstick design the manufacturing strategy and the quality assurance system with the goal of increasing the product and flow quality and how can the result be evaluated?

Method
A systems approach was chosen for this thesis, as it is congruent with the holistic purpose of this study. An abductive approach has allowed the authors to move back and forth between theoretical studies and empirical data collection. A case study was performed, as it was the preferred method since there was a need to cover many factors of a complex system.

A mix of qualitative and quantitative data was gathered from interviews, IT-system and an operator survey.
Literature studies were conducted within relevant fields of interest to ensure a solid foundation for the following analysis.

**Method of analysis**
The analysis of Scandstick’s current work was conducted from a systems perspective based on manufacturing strategy, TQM and performance measurements. The organization formulates a manufacturing strategy based on available information. This manufacturing strategy is then realized by the organizational process while being monitored by quality management and thereby creating an output. This output can be evaluated and information can be gathered about the efficiency of the process. The information can subsequently be used to evaluate and improve the organizational performance and adjust the manufacturing strategy.

**Manufacturing Strategy input**
Classical literature on manufacturing strategy process is rooted in the corporate planning paradigm, which sees strategy making as a sequential process in which plans are formulated and then implemented\(^1\). The decision areas from which strategy is derived all interact and the manufacturing strategy must take into account the changing competitive environments and priorities. Structural and infrastructural issues are two pillars of manufacturing strategy and these criteria are needed to attain internal and external consistency. Structural issues set the process and technology for operations whereas infrastructure provides a long-term competitive edge by continuously improving upon human resource policies, quality systems, organizational culture and information technology. Infrastructural issues are long-term goals that support the structural issues which are developed through persistent day to day use and the commitment of top management and teamwork at all levels. It must be ensured that all decision areas are analysed to establish the current state, and monitored to develop a strategy\(^2\).

**Quality Management System process**
The quality management system consists of the necessary monitoring and standardization of improvement measures\(^3\). The system should also contain management tools and techniques for quality planning, customer communication, data processing, continuous improvements, problems solving and employee involvements. A quality management system process also includes analysis and improvement of organizational processes and performances.

**Performance Measurement outputs**

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This section should provide the measurement and feedback and involves the design, implementation and use of performance measures. The performance measurement system is designed and implemented along with the implementation of the quality management system, such that it provides an effective mechanism for reviewing and revising targets and standards. The outputs provide the feedback for analyzing current strategic objectives for individual processes throughout the organization. Since the external and internal environment of an organization is dynamic, the performance measurement system must quickly respond to a changing environment to achieve alignment with strategic priorities.

### Results

A quality management system at Scandstick could be implemented using the research by Gobadian & Gallear and Hanssons & Klefsjö. Organizations with 10 to 99 employees can benefit from using the above mentioned model where a comprehensible structure is shown. The structure is accompanied with information of which specific TQM values that should permeate the different steps. In phase 1 the TQM values committed leadership and let everybody be committed should be given a central role. In the first phase Scandstick should primarily focus on how to involve middle management and secondarily how to involve the employees. The initial investments have been shown to finance themselves and furthermore these investments could be considered low compared the Scandstick’s current costs of poor quality.

In order to create the needed change in organizational culture top management should establish a “sense of urgency”,

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preferably a threat that the TQM implementation could resolve. In phase 2 the TQM values committed leadership and let everybody be committed should be well rooted and focus should be placed on transforming Scandstick to an organization that places focus on the customer. The fourth step “plan the TQM implementation” involves several suggestions for activities that help share information between functions but also the creation of quality teams and transferal of responsibility from management to machine operators to facilitate an increased level of quality. Generally organizations consider the TQM value focus on processes difficult and therefor Scandstick should consider getting the needed knowledge of process orientation to ease the transition from a functional to a process oriented organization. The third phase work should continue from the established structure and quality teams should be able to work independent and show results. Working with processes should be given additional resources. The TQM value of base decisions from facts is a natural part of Scandstick and closely adhered to. Management can now change the primary focus from TQM implementation and instead concentrate on managing the processes and supporting the employees with relevant education and resources. During the models fourth step Scandstick could benefit from creating quality improvement teams working with the projects that management specify. The teams could be used to solve problems and then implement the solution in the organization. Management should evaluate solutions and communicate the conclusion to the relevant parts of Scandstick. Other ways to improve quality could be the creation of relevant forums for communication. Information boards placed in the production halls could be used by management to uphold the necessary sense of urgency but also to inform workers of recent or upcoming events. Scandstick should also consider the possible gains of transferring the responsibilities for the production equipment to the workers. Maintenance duties could be given to the workers if they were to receive proper training and education and thereby increasing product quality by helping the workers identify defects. Flow quality could also be increased this way by allowing the machine operators to fix problems themselves instead of waiting for service personnel.

The performance measurement system at Scandstick is currently designed from a purely financial perspective. To aid the TQM implementation the financial perspective needs to be augmented with three other perspectives; competency development, external customer satisfaction and organizational efficiency. Competency development needs to be monitored, as the TQM implementation will require education for the employees at Scandstick. External customer satisfaction gives Scandstick much needed information from the market and thereby allowing this information to reach the production managers. The organizational efficiency perspective can help Scandstick with evaluating the changes to the organization, especially when going from a functional organization to a process oriented one. A new bonus system for the machine operators could be formulated from these perspectives, resulting in a lower risk of sub optimization and less internal competition. A connection between TQM principles, TQM related...
Performance metrics and evaluation perspectives is presented in the following table:

<table>
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<tr>
<th>Principles of TQM</th>
<th>TQM-related performance metrics</th>
<th>Evaluation perspectives</th>
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</table>
| Committed leadership | • Employee opinion survey  
• Employee satisfaction | • Organizational efficiency |
| Focus on customers | • Customer satisfaction survey  
• Customer retention  
• Number of customer complaints  
• Repair costs  
• Supplier satisfaction survey | • External customer satisfaction  
• Financial |
| Base decisions on facts | • % of the industry market share  
• Rework/scrap rate  
• Cost of quality  
• Return on investment  
• Supplier satisfaction survey | • Organizational efficiency  
• Financial |
| Focus on processes | • Customer satisfaction  
• Sales growth  
• Lead time reduces  
• Material and labor efficiency | • Financial  
• Organizational efficiency |
| Improve continuously | • Incidence of product defects  
• Percent shipments returned due to poor quality  
• Rate of implemented improvement proposals. | • Organizational efficiency  
• External customer satisfaction |
| Let everybody be committed | • Employee opinion survey  
• Employee capabilities | • Developing of competence  
• Organizational efficiency |

Conclusions
Scandstick AB should consider working according to TQM to create a structure for proactive work from the principles of continuous improvements, everybody’s commitment and focus on customers. This implementation should be revised with consideration of the company’s culture and size but also in preparation for an upcoming ISO certification.

The evaluation of the new activities accompanied by an implementation of TQM could preferably be done with the help of a performance measurement system based on four perspectives; developing of competence, organizational efficiency, external customer satisfaction and financial measurements.

By using the perspectives of the performance measurement system, Scandstick can assess the goals and success factors of TQM. In this way the performance measurement system can also be designed to pull people toward the firm’s overall TQM program.

Further we suggest that for successful TQM implementation and effectiveness, Scandstick should use performance measures that align the interests of employees with that of the firm. The use of traditional financial measures are not likely to present indicators that direct employees to take a holistic view, and instead encourage employees to take a narrow view of what actions are required to achieve targets.
References

Literature

Articles


