Business Plan
Deltaformer as an improvement product

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A case study at Metso Paper, Sundsvall

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Preface

This Master’s thesis was conducted during the autumn and winter 2007/2008 at Metso Paper Service Center in Sundsbruk, Sundsvall. It was the final part for my Master of Science degree in Industrial Engineering and Management at Luleå University of Technology.

It is in great appreciation, that I would like to express my gratitude towards the people that have helped this project to come through. At first I would like to thank my supervisor at Metso paper, Mattias Fernström for loads of advice and useful thoughts. Arne Wessbladh that also guided me through this time, and Dennis Nordgaard for technical support. In addition best regards to all other co-workers at my department, that have made this a very pleasant time. Thanks also, to Ellinor that supported me in times of doubt.

Finally, I would like to show my appreciation to my LTU supervisor Håkan Perzon.

Sundsvall, February 2008

Daniel Jonsson
Abstract

The global pulp and paper process supplier, Metso Paper Sundsvall AB is a part of the Metso group. The subsidiary company is currently facing challenges on a changing market for their products. The strategy to adapt for this change is an ongoing focus on rebuilds businesses and services. This study is a part of the new strategy to sell upgrade products for existing machinery.

This master’s thesis handles the business planning process preceding the launch of a new product. The product is applicable in the washing process of chemical pulp and a similar component is applied on all new washers sold by Metso Paper (MP). The reason that this upgrade product was developed, is that MP suspects that customers could gain several benefits on upgrading their production lines and this provides a business opportunity.

The purpose of the study is to investigate what strategy MP should undertake to successfully launch this product, and also to reveal the potential sales value and customer value. To systematically perform the analysis, a model that defines the components of a business opportunity is chosen, ”the opportunity model”.

My empirical investigation have resulted in a description of the current market situation and a review of the product features. From this I have been able to segment the market, identify the most attractive customer group, and also estimated the customer value of the product. The value for MP is estimated in a sales forecast and the consequential costs are gathered. Further on I have developed concepts and strategies for an optimal launch of this product.

What has to be noticed is that figures used in this case are rough estimates. The purpose is to state a reference, but the findings of this specific case can not be representative for the general customer.

Conclusions from the analysis is that the most profitable application for the product is debottlenecking. This is what generates the most profits for the customer, and also more sales for MP since capacity expansion requires a rebuild of larger scale. However, with maintained production conditions, the product could also provide a sufficient value to the customer as shown in one of the cases. Other findings are that the product is more profitable for the customer when applied on big size washers. These customers are primarily located in Scandinavia, North America, South America and Asia. What has to be considered when identifying possible customers are the structure of the markets, since many countries face close-downs of plants and other countries many new start-ups.

Further on I have discussed new pricing and marketing strategies that will maximise both sales volume and profit margins.

To improve sales management, MP should consider employee retention strategies to strengthen the buyer-seller relationships. It is also clear that MP salespeople needs training and stronger incentives to sell this product, as it differs from the ordinary product range and requires additional knowledge of customer’s processes.

Furthermore, this study have been compared to MPs template business plan. Additions and improvements have been suggested. My contribution to the template includes segmentation and identification of target customers, time perspective analysis and risk analysis both concerning the business environment and competitive structure.
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1 Terminology
This section will introduce abbreviations that occur in the following texts and briefly explain the meanings of each concept.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADT</td>
<td>Air Dry Tonnes – Pulp with 10% water content</td>
</tr>
<tr>
<td>BHKP</td>
<td>Bleached Hardwood Kraft Pulp – Wood pulp based on broad-leaved trees and bleached with sulfate</td>
</tr>
<tr>
<td>BSKP</td>
<td>Bleached Softwood Kraft Pulp – Same as BHKP, but based on conifer trees</td>
</tr>
<tr>
<td>COD</td>
<td>Chemical oxygen demand – method to measure organic pollutants in water</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product – measuring size of economy by consumption</td>
</tr>
<tr>
<td>GL&amp;V</td>
<td>Groupe Laperriere et Verreault – Canadian paper machine manufacturer</td>
</tr>
<tr>
<td>PLC</td>
<td>Product life cycle – theoretical definition of how sales changes over time</td>
</tr>
<tr>
<td>PM</td>
<td>Profit Margin</td>
</tr>
<tr>
<td>P&amp;P</td>
<td>Paper and pulp</td>
</tr>
<tr>
<td>PWC</td>
<td>PriceWaterhouseCoopers – business consulting company</td>
</tr>
<tr>
<td>ROI</td>
<td>Return On Investment</td>
</tr>
<tr>
<td>M&amp;A</td>
<td>Mergers and acquisitions</td>
</tr>
<tr>
<td>MC</td>
<td>Medium consistency – in this report referring to pulp consistencies of 6-7%</td>
</tr>
<tr>
<td>MP</td>
<td>Metso Paper</td>
</tr>
<tr>
<td>OEM</td>
<td>Original Equipment Manufacturer – Selling a product as a part of another Manufacturers product and brand</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and development</td>
</tr>
</tbody>
</table>

2 Introduction
The introduction purpose is to interest the reader to the subject and to portray sufficient background information about the problem area.

Despite the evolution of the information technology in the society, there are no signs of declining demand for pulp and paper (p&p) products (ec.europa.eu). The pulp market though, is generally known for being cyclical and the growth is expected to slow down in some parts of the world (MP business intelligence).

The last decade there has been a trend of increased production costs in the p&p industry, mainly in Europe and the United States, but also in the rest of the world. Cost efficiency is the most important factor in all production. Profitability of the companies has although remained steady thanks to refined production (Länsiluoto et al 2004). Further increased costs are to be expected in the EU due to emission allowances and rising energy prices (ITPS 2004).

Growth in the emerging countries has raised demand for pulp producers in other regions, and this trend is expected to continue. The most powerful countries in the p&p industry is North America, Brazil, Indonesia and Chile. The pattern is although a flow of investments from mature markets to emerging markets and thereby the markets of p&p production equipment can be considered mature or declining in some parts of the world (Jaakko Pöyrö 2007). Considering these structural changes of costs and demand, there is a need to adapt strategies for future challenges, and the product portrayed in this report is a part of Metso Papers new strategy.

Metso Paper (MP) is the worlds leading supplier of p&p production machinery, service and spareparts. Within the company there are five business lines; Fiber, Paper and Board, Tissue, Power and Panelboard. The Sundsvall plant, located in Sundsbruk, belongs to the Fiberline business unit. Metso Paper Service Centre in Sundsvall repairs and supplies spareparts and single upgrade machines to customers all over the world. Some parts are restored in the service workshop, others are replaced. Some of the parts are manufactured by external suppliers. Improvement Services is a part of the
Service centre with a focus on selling upgrades to previously installed machinery (www.metsopaper.com).

About 40% of MPs business comes from new lines, 30% from rebuilds and 30% from process improvements and other rebuild services (www.metsopaper.com).

Metso Paper’s strategy since 2005 is “profitable growth”. The aim is to transform from a product-oriented company to a service-oriented company. To develop this strategy there is now an extended focus to develop new upgrade products for the process services department. MP also wants to increase their presence in the emerging markets (www.metsopaper.com).

3 Problem

*This section will explain the problem area and justify the importance of this subject being researched.*

A Twinroll™ rollpress is a machine used by pulp producers to wash and dewater the pulp in different stages of the manufacturing process. A more specific review of the pulping and pulp-washing process can be found in chapter 10.

**Figure 1. Twinroll™ press.** (Metso intranet)

Metso have been supplying many Twinroll™ presses all over the world. Customer’s demand for improved quality and cost efficient production capacity drives development of upgrades to existing machines. There are today several replacement components that can improve the performance of the Twinroll™ presses (MP intranet).

The department of Improvement services has developed an upgrade product to improve pulp injection to the rollpress. This system is called Deltaformer™. The upgrade is suitable for the DPA presses (see ch 10.1.2 History), but the benefits generated differ depending on the characteristics of production. Since the price of the upgrade is estimated to be set to about one third of the price of a new roll press, MP suspects there is a potential business opportunity in selling the upgrade. On the other hand, the customer value and thereby sales potential of this product is unclear and that is why MP seeks to establish a business plan (Fernström 2007).

The reason that this mission was assigned a master thesis project was to gain a new perspective on business planning and a more scientific approach.
4 Purpose

This section explains the purpose of this report.

The customer value in terms of increased productivity, less downtime and less effluent comprises a business opportunity. The purpose of this study is to investigate the market potential of the Deltaformer™ product, and locate the best way to generate profits from this.

5 Limitations

In this section, restraints will be specified in order to simplify the problem and to limit the scope of the study.

- Factors defining benefits of the product varies between customers and different applications. Therefore a case will be chosen to state a reference and other customers will be compared to this.
- The product can be bundled in various ways depending on what customer’s desire. To restrain the number of scenarios, the scope of supply will be limited to main machinery and basic engineering.
- The time value of money will be discarded in financial appraisals.
- Financial figures are in case of subsidiary companies taken from the parent companies

6 Problem definition

From the previously described issues, the problem definition will be the following:

What actions should Metso Paper undertake to successfully launch the Deltaformer™ product on the market?
7 Theory
This chapter reviews the literature of the problem area previously described. It begins with a general introduction to business planning and continues with the theory of opportunity. Moreover the tools for examining each context and element of opportunity is justified and described.

7.1 Business planning
Business planning, or strategic planning are concerned with the long-term direction of the organisation. It is a statement in text and figures that should test the sustainability of a business concept. The purpose is to define what businesses the organisation will engage in and match those activities to the environment and the organisation resources so that there is a minimisation of threats and maximisation of opportunities (McDonald 1996). A business plan should be long enough to contain the sufficient information, but not so long as to overwhelm the reader. The focus should be on future actions supported by financial data, not masses of historical data.

Markets are rarely static. With changes in the business environment new opportunities emerge, companies redefine their strategies and there is a need for business planning (Jobber 2004). The purpose of this business plan is to determine which strategies to adopt when spotting a business opportunity. When I first started this study, I wanted a clear model that justifies the components of a business plan. The theory of analysing opportunities was researched and a model was chosen. This model is a systematic way of analysing opportunities. In the context of this theory, other marketing tools will be employed to examine each factor of opportunity to generate measures and conclusions.

7.2 The opportunity model
The notion “opportunities” might appear in three different shapes according to Morris (2005); possible options for solving a problem; a time-constrained platform from which options are viewed and evaluated; or the solution actually chosen. Having an opportunity implies that there is nothing hindering an action or a choice, but instead expressing its freedom of constraints.

Recognition of an opportunity is affected by the problems we face and the nature of these problems, our notion of sacrifice, how we evaluate risk, how we perceive time. Other factors are; what conditions we believe will lead to improvements, the techniques we use to predict the future or the outcome of our actions, the extent of which we can feel regret and the causal influences we believe operate in the world (Morris 2005).

An opportunity consist of a specified set of conditions that must be met for an occasion to be an opportunity. One of the reasons for employing the model is to make intentions of an organisation explicit. Other applications could be, for example in investing, economics, gambling, criminology and marketing where it can evaluate the effectiveness of an option. The characteristics of an opportunity are the following according to Morris (2005):

The context of opportunity:

- **Problem:** the fundamental condition for an opportunity is a problem, a challenge, adversity, dissatisfaction, an obstacle or a threat. A problem is the difference between the actual state of affairs and a desired condition resulting from a choice. In the case of an organisation, it relates to the mission and strategic plan.
- **Choice:** to solve the problem you have to make a choice among different alternatives. These alternatives must be effectual solutions to the problem; this means they cannot be unrealistic dreams without known ways of bringing them out.
- **Value:** The solution to the problem seeks to improve conditions and find advantages, which mean opportunities have a value.
The elements of opportunity:

- **Time constraints**: the choice of an alternative has a limited time, an opportunity will not last forever. When faced with an opportunity, there is a limited time during which either an important decision must be made, the sacrifice required is diminished, or the risks associated with a decision is lessened.

- **Sacrifice**: by choosing an option you have to give up something else. This can be effort, resources or ignoring other goals. Usually we expect to receive more than we give up. Common concepts of measuring sacrifice is opportunity costs, marginal utility and sunk costs, where sunk costs in an economists point of view is irrelevant for future decisions.

- **Risk**: This is the chance that actions and events planned as components in the solution to a problem will fail. Judging whether a solution to a problem will work involves assessing risk. A reduction in the normal risk associated with an option often marks an opportunity. The more important the potential opportunity, the more important is the judgement of risk.

- **Catalyst**: this is something that affects how we evaluate the opportunity, but is not under our control. An external event that modificates the circumstances of opportunity. They prompt us to recognise new options, re-evaluate options currently under consideration, or revisit previously discarded options.

- **Possibility to regret**: Failure to recognise an opportunity or failure to act on an opportunity can lead to regret. There are many examples of this in marketing practise where companies have missed opportunities or conducted certain actions have led to poor businesses and thereby regret.

Evaluations of these characteristics could be quantitative or qualitative measures (see 9.3 Research approach). Attempts to quantify the solutions to a problem with the help of game theory and thereby quantify opportunity have been made. However, quantitative measures will not capture the full complexity of the opportunity. The limitation of quantitative measures is that they deal only with socially unimportant conflicts, and game theories often assumes that opponents will make flawless decisions. Even if it is hard to quantify opportunity, certain aspects of it can indeed be given numerical specifications. Examples of this are risk, value and time (Morris 2005).

In the following section, tools will be chosen to assess the characteristics of opportunity.

### 7.2.1 Problem

As the problem is the difference between the current state of the company and the desired state, we need to analyse the current position of the organisation and what the desired state is. To define the differences a Gap analysis will be used.

A Gap analysis is a business resource assessment tool enabling a company to compare its actual performance with its potential performance and then decide whether to implement new strategies or not. This analysis provides a foundation to understand how much effort that is required to have a specified aim achieved. The equation that has to be considered is (http://facstaff.bloomu.edu/sbatory):

\[
\text{Market potential} = \text{Usage Gap} + \text{Existing Usage} \tag{1}
\]

To find the usage gap, the existing usage has to be analysed and subtracted from the total market potential. The existing usage consists of four elements:

- **Existing usage** = **Existing sales** + **Distribution gap** + **Product gap** + **Competitive gap** \( \tag{2} \)

- **Existing sales**: This is the actual current use of the product by all the potential customers in the market.

- **Distribution gap**: This is when the distribution of a product is limited to certain geographical regions or certain distributors.

- **Product gap**: This gap represents the part of the market from where the organisation is excluded because of product or service characteristics. It can be undiscovered market segments, segments that
the organisation is unable to serve or customer groups where there are better competitive offerings available.

**Competitive gap:** This is the market share held by similar products. This gap is affected by factors such as price and promotion.

### 7.2.2 Choice

Based on the strategy described in the introduction and the opportunity formulated in the problem section, we have different alternatives on how to achieve the desired state of the company. As the marketing resources are limited and there is a broad spectrum of customers fitting our strategy, we must decide where to focus our efforts. A tool for defining potential paths is market segmentation.

Market segmentation may be defined as "the identification of individuals or organisations with similar characteristics that have significant implications for the determination of marketing strategy" (Jobber 2004). It arises because it is necessary to balance diverse customer needs with the capabilities and resources of competing organisations in the marketplace (Dibb et al 1997). Due to a broad spectrum of customer requirements, single organisations are unable to satisfy all customer needs. By focusing on a smaller group of customers with homogeneous needs, companies can concentrate their efforts and assets to succeed in this area.

The gains to be made from market segmentation are the following according to Jobber (2004):

![Figure 2. Gains from market segmentation (Jobber 2004)](image)

By selecting a target market with homogenous customer characteristics, a single marketing mix strategy can be developed to match those requirements. Creative segmentation can result in the identification of new business opportunities in market segments that have not been served adequately. Segmentation also allows companies to differentiate their strategies between the segments which creates a differential advantage over the competition in each segment. As the market changes, new segments emerge. The company who first spots the new opportunity can gain competitive advantage. Therefore segmentation is important in order to identify opportunities and threats (Jobber 2004).

An effective segmentation process involves three steps; marketing analysis, strategy development and marketing programs. If the process is conducted correctly, the company will experience benefits such as; putting the customers in the first place, maximises resources and emphasises strengths over competitors (Dibb et al 1997).

Shapiro and Bonoma (1984), claims that the most appropriate segmentation approach is to start from a very general level and go to more individual levels by "breaking down" the segmentation bases. The so-called "a priori" approach. In this traditional approach, the segmentation variables are decided before data is collected. This can create homogenous market segments that are heterogeneous with respect to benefits (Rao et al). Kotler (1991) on the other hand, claims that it is more suitable to start out from the premise that buyers are different and the aim is to find similarities, i.e. to start from an individual level and build up clusters of customers, the "a posteriori" approach. In this study, the latter will be used. This process can be defined in three stages according to Jobber (2004):
1. Identifying characteristics of individual customers
2. Grouping them into segments
3. Identify the most attractive segment

When it comes to industrial market segmentation, you can use many of the variables from consumer marketing. However, there are some variables that are only used in industrial marketing. These variables differ from case to case and have to be considered carefully.

According to Kotler (1991), Segments must be measurable (valuable size), substantial (large/profitable enough to give attention), accessible (possible to focus marketing efforts on) and actionable (possible to serve).

There are classifications of segmentation variables in industrial marketing suggested by researchers. Porter (1985) claims that these variables can be divided into four classes:

- **Product segments;** physical size, price level, features, technology, packaging, performance, bundling etc.
- **Buyer segments;** industry, strategy, decision making, OEM vs. user, size, ownership, financial strength etc.
- **Channel segments;** selling direct or through distributors, exclusivity etc.
- **Geographic segments;** regions or countries, weather zones, country development etc.

When segmentation variables are defined, those of each class can be combined into a matrix combining them into the most valuable segment. Each of these matrixes can be put together into an overall segmentation of the industry (Porter 1985).

In the example below, the restaurant food market is segmented from four different variables; Price, Serving temperature, Healthiness and Flavour. The combined matrix visualises different segments.

Matrix 1

<table>
<thead>
<tr>
<th></th>
<th>Hot</th>
<th>Cold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive</td>
<td>Filet mignon</td>
<td>Sushi</td>
</tr>
<tr>
<td>Cheap</td>
<td>Hot dog</td>
<td>Salad</td>
</tr>
</tbody>
</table>

Matrix 2

<table>
<thead>
<tr>
<th></th>
<th>Healthy</th>
<th>Not Healthy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spicy</td>
<td>Sushi</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>Salad Filet mignon Hot dog</td>
<td></td>
</tr>
</tbody>
</table>

Combined matrix:

<table>
<thead>
<tr>
<th></th>
<th>Spicy / Healthy</th>
<th>Mild / Healthy</th>
<th>Spicy / Not Healthy</th>
<th>Mild / Not Healthy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold / Exclusive</td>
<td>Sushi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot / Exclusive</td>
<td>Filet mignon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold / Cheap</td>
<td>Salad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot / Cheap</td>
<td>Hot dog</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3. Segmentation of the restaurant food market.
7.2.3 Value

According to the opportunity model theory, an opportunity seeks to improve conditions and create a value. In this study, the term “value” will concern economic profitability, for both the supplying organisation and the customer. The value for the organisation is generated in terms of sales to the targeted customers. Sales in itself is generated by the value the product offers the customer. Thereby, the value from both a company perspective and a customer’s perspective have to be measured.

7.2.3.1 Value to the customer

To measure the value of an investment, both incomes and costs generated have to be considered. Payback period is a commonly used capital investment appraisal taking these factors into account.

This ratio measures the number of years before the initial investment is paid back by later cashflows. Payback period is calculated by accumulating the cash inflows generated by the investment until it exceeds the cost of the initial investment (see formula 1). A decision rule would involve comparing the calculated payback period with a target period, but there is no accepted standard on how to set the target period (Dyson 1990). A short payback period is preferable (all else being equal). Usually the measure implies that the cash flow continues after the payback period, but this is ignored. The time value of money is also ignored. Payback period is widely used because it is easy to understand for most individuals.

Example:
Initial investment: 10000
Annual cashflow: 2000
Payback period: 5 years

Table 1. Payback calculation example.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cashflow</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative cashflow</td>
<td></td>
<td>0</td>
<td>2000</td>
<td>4000</td>
<td>6000</td>
<td>8000</td>
<td>10000</td>
</tr>
</tbody>
</table>

Mathematic formula:

\[
\text{payback period} = \frac{\text{Investment}}{\text{Annual cashflow}} = \frac{10000}{2000} = 5
\]  
(3)
7.2.3.2 Value to the organisation

The value for the supplying organisation will be measured in terms of profit generated relative to the cost of this project. To estimate this, I will employ the Du Pont model.

![Du Pont model diagram](http://home.att.net)

The Du Pont model provides an helicopter view of a company’s profitability. It consists of two parts; the profitability part and the asset part. Gathering figures from the balance sheet and the income statement results in the return on investment. The model is an efficient tool for simulating the effects of changes. Drawbacks with the model are that the calculations are before tax, and it does not count the time value of money. The outcome is also highly affected by the validity of the figures from the balance sheet and income statement, so these must be carefully reviewed.

Calculating the factors of this model will include assumptions of future sales, costs and also historical figures which means that the result will be a rough estimate, not a precise picture. Costs are internal information that can be gathered from departments within the organisation.

To estimate future sales, we will have to establish a sales forecast. In the following section forecasting theories are reviewed.

7.2.3.2.1 Sales forecast

Sales forecast can be established for various reasons and time perspectives:

- **Short-term forecasts;** These are usually for production planning purposes and focuses on short term fluctuations in sales. The time period is up to three months
- **Medium-term forecasts;** These are normally for planning one year ahead. A common purpose is budgeting.
- **Long-term forecasts;** The time period depends on the type of industry. In the information technology business, three years is a long period, while in heavy industry a ten year period is commonly considered long-term. The purpose is normally to give implications for management, and these forecast are worked out from macro-environmental trends.

Techniques used can be qualitative or quantitative. Qualitative methods are such as user surveys, expert opinion and product testing. Quantitative method could be computer model simulation, time series analysis or leading indicators analysis (Winklhofer et al 1996).
The purpose of this business plan is to give implications for management of expected total sales and due to this a long-term forecast will be established. This will be achieved with an analysis of the resources available, historical data, and experts opinion.

Sales volume over time is commonly characterised as different stages in the product life-cycle. The length of stages is affected by factors such as; marketing efforts, purchasing behaviour, emergence of competitors, economic conditions and trends (Jobber 2004).

![Product Life Cycle Curve](www.trumpuniversity.com)

7.2.4 Time constraints

Of all elements of opportunity, this is the one we take most for granted. But time is actually very critical to avoid missed opportunities. Time constraints can be an external deadline or a restricted period during which the sacrifice is diminished or the risk is smaller. It relates also to catalysts that changes over time (see Catalysts) and thereby customer preferences. History shows that the time perspective has become more important as our actions focus more and more on future provisions (Morris 2005). To determine the time horizon of this project, we will rely on the following theory.

The answer to the question how far into the future your strategic plan will last, depends on at least six factors (Harrison 1995);

- **Product life cycle**: The planning horizon should at least encompass the full life cycle of the product.
- **Technological change**: This limits the planning horizon for competitive reasons. For example a high-tech company need a shorter planning horizon due to the high rate of technological change.
- **Lead time**: The interval between formulating and establishing a strategic objective and its expected maturity.
- **Present value**: Money has a time value. For example an expected rise of interest rates would call for a shortening of the planning horizon as the relative cost increases.
- **Organisation life cycle**: Young organisations with high growth rates usually have shorter planning horizons. When the organisation becomes more established, its planning horizon would be extended accordingly.
- **Validity of planning premises**: Planning is dependent on assumptions regarding future events. Reliance on such assumptions can limit the planning horizon.
7.2.5 Sacrifice

Most long-term goals worth striving for, involve sacrifices of time, effort and money. In the context of opportunity, a sacrifice is the cost paid for something better. This is not necessary money, but can also be a value through reputation or good-will. The sacrifice can also be a restriction of freedom, for example signing a contract (Morris 2005).

7.2.5.1 Specific investments

To justify the choice of actions taken, the sacrifice has to be related to the output, in this case the estimated profit that will be received from sales. To achieve a fair value, the sacrifices that are specific for this product has to be gathered. This could for example be:

- R&D expenses
- Salaries
- Marketing
- Training / Education

7.2.6 Risk

Future revenues depend on uncertain assumptions of market condition factors. To handle with this risk there are several methods that differ in technique and interest group (Dyson 1990). In this study, risk will be investigated both from an environmental perspective and strategic perspective.

7.2.6.1 Country risk

This is the risk of hazards that can affect the profitability of the project, either by decreased sales, profitability or increased costs.

Risk identification can be described by the following basic elements:

- Sources of risk
- Hazard factors
- Perils
- Exposures to risk

According to Tchankova (2002) the sources to risk that faces an organisation are physical, social, political, operational, economic, legal and cognitive.

**Physical risk** is how the physical environment affects your businesses. It could have negative influences like natural disasters that leads to losses, but it can also be an opportunity. For example peoples awareness of how they influence the environment can create an opportunity for environmentally friendly products.

**Social risk** is the hazards of human behaviour, like strikes, social riots et cetera. It is also uncertainty caused by differences in social values and culture.

**Political risk** is the influence of the ruling system. It includes tax policies, environmental regulations and confiscation of foreign investments.

**Operational risk** could be uncertainty in transportation system or unfavourable working conditions that can damage both physical and mental health.

**The economic risk** is usually influenced by the political risk, but globalisation has created a risk that has to be considered separately. Uncertainties in a global perspective can be economic recession and depression and at the local level interest rates and credit policies.

**Legal risks** are limitations by copyrights, labour rights and environmental regulations. On the other hand these regulations also creates stability in the society.
Cognitive risk is the difference between our perception of risk and the reality. Production accidents caused by carelessness are an example of a consequence of high cognitive risk (Tchankova 2002).

Global insight (www.globalinsight.com) has developed a country risk-rating system that allows comparing and evaluating the investment climate in countries around the world. Each country is rated from six different perspectives; political, economical, legal, tax, operational and security. What Tchankova denotes physical and social risk is included in Global insights operational risk. These factors have different weights in the overall country risk according to their importance from an investor’s point of view. The ratings range from 1 to 5 where 1.0 indicate minimum risk and 5.0 maximum risk.

![Global Insight Country Risk Weightings](www.globalinsight.com)

**Figure 6. Factors weight in risk analysis. (www.globalinsight.com)**

7.2.6.2 Competitive risk

This is the risk that the demand for a company’s goods or services will decline due to the action of competitors. To assess this risk, a model of measuring industry competition will be applied.

The Porter model of competitive industry structure

Porter’s five forces model is a systematic way of analysing competitive industry structure. This analysis can be done in all levels of the organisation but is usually performed at the business unit level. The industry attractiveness can be determined by looking at the forces driving competition and the strength of each of these. By understanding the opportunities and threats, you can identify the strengths and weaknesses of a company. The five forces driving competition are: threat of new entrants, bargaining power of buyers, bargaining power of suppliers, threat of substitutes and intensity of rivalry in the industry. Each of these forces comprises a number of elements that together affects the degree of competition.
The threat of new entrants: In markets with high profits, new competitors are expected to enter to take part of the profit. However there are barriers to entry, for example; economies of scale, capital requirements, switching costs, access to distribution and expected retaliation.

The bargaining power of buyers: This is when firms have such a good bargaining position that they can obtain favourable terms and conditions from suppliers. High buyer power characteristics are; few dominant buyers and many sellers, standardised products, buyers threaten to integrate backwards, no forward integration by suppliers and if the industry is not a key supplier. In the case of high buyer power, the buyers have strong influence on the price of products. The OECD definition of buyer power is when a buyer in relationship to a supplier can impose a long-term opportunity cost that is disproportionate to any cost to itself (http://ec.europa.eu).

The bargaining power of suppliers: This is in contrary, when suppliers are so important to their customers, that they can set favourable prices. High supplier power characteristics are; many buyers and few dominant suppliers, differentiated highly valued products, forward integration by suppliers, no backward integration by buyers and if the industry is no key customer group to the suppliers. If the suppliers are few, they can keep high prices to capture some of the buyer’s profit.

Threat of substitutes: This element comprises buyer’s willingness to substitute, the relative price performance of substitutes and the cost of switching to substitutes. A close substitute will force companies to keep prices low and thereby the manufacturing cost is affecting the threat of substitutes.

Intensity of rivalry: Factors of this force are such as; structure of competition, structure of costs, degree of differentiation, switching costs, strategic objectives and exit barriers (Jobber 2004). A measure of rivalry could be the Concentration ratio. This ratio is the percentage of market share held by the four largest companies. A high ratio is usually considered to indicate less competition. The growth of the market also measures the competition. As a slow growth will force companies to fight for market share to increase revenues, this indicates a high level of competition.

The competitive profile analysis is used to identify possible competitive strategies. By adopting the most appropriate competitive strategy, the organisation seeks to overcome the risk from competitors. The two means of competitive advantage; differentiation or cost-leadership combined with the scope of activities; broad or narrow, results in four generic strategies: differentiation, cost-leadership, differentiation focus or cost focus (Jobber 2004).

7.2.7 Catalysts

A catalyst is an external event that can trigger an opportunity. This could be a change, conflict, disconnect or other circumstances that changes the way we evaluate the solution to a problem. These are not usually in our control (Morris 2005).

The catalysts are apparent in most of the previous analyses, for example they can be external factors in the SWOT matrix, factors related to the segmentation variables, time limitations, risk factors et cetera. These catalysts are discussed in all analyses made. It is therefore unnecessary to further analyse these.

7.2.8 Possibility to regret

The extent to which you will feel regret from a bad decision depends on the possibility to withdraw your sacrifices. In this case this is resources sacrificed by the organisation facing the opportunity. A measure of resources that you cannot withdraw is so-called sunk costs. This relates to time, money, physical or emotional efforts that are gone or spent. Highly specific investments, for example R&D are usually sunk costs. These costs often represents barriers to exit, because of the difficult decision to exit the market when high sunk costs have incurred (Morris 2005).

In contrary, a company that is planning to enter a certain business will have to consider the sunk costs that will not be recovered during operations. In this perspective, sunk costs represents barriers to entry
In this study, sunk costs will be estimated to analyse what the loss will be if the project fails.

7.2.9 Development of strategies

To summarise the opportunity and outline the paths towards the goal, two tools will be employed: a SWOT analysis and the development of a Marketing mix.

7.2.9.1 SWOT analysis

A SWOT analysis is a systematic approach of reviewing strategy, position and direction of a company. This is done by gathering the internal strengths and weaknesses and compare how they relate to the external opportunities and threats. It is a subjective assessment of data that is organised by the SWOT format to help decision making. The SWOT analysis is especially appropriate for measuring a business unit, a proposition or an idea. When evaluating the strengths and weaknesses, only those that will be valuable for the customer should be included. A common error is to include what is considered an internal strength, but is actually a weakness from a customer’s point of view. It is also important to define the subject of the analysis because a SWOT analysis is the subject of only one thing, and it is important that people seeing the analysis understands the purpose (Dealtry 1992).

Figure 8. A SWOT chart. (http://skyways.lib.ks.us)

A strength could be patents, brand, reputation, know-how and access to resources or distribution for example, while the weaknesses is the opposite; lack of know-how and so on. The strengths can sometimes be considered weaknesses as well, for example heavy investment can create competitive advantages but on the other hand hinder strategic changes (ibid).

Opportunities could be unfulfilled customer needs, new technology, loosened restrictions of trade for example. Threats may be the opposite, like shifts in demand, substitutes, new regulations et cetera (www.quickmba.com).

The aim of the analysis is converting weaknesses to strengths and threats to opportunities (conversions strategies) and to match the strengths with opportunities (matching strategies). (Jobber 2004).

The process of conducting a SWOT analysis can be divided into five stages according to Dealtry (1992):

1. 1st cycle process application: This stage includes specification of the task which is very important to ensure validity, SWOT survey (listing issues), appraising issues and review issues.
2. Adding structure to the process: sorting issues according to the issue profile matrix, stakeholder model, scoping model, SPELT model et cetera.

This business plan will not involve planning of sales actions and implementation of new strategies. Accordingly only the first two steps in the SWOT process will be performed, and strategies will be outlined in combination with the marketing mix.

7.2.10 The marketing mix

Based on the understanding of the customers, a company should develop its marketing mix. This mix consist of four major elements, called the 4Ps; Product, Price, Place and Promotion. There are decisions to be made in these areas in order to satisfy or exceed customers needs better than the competition (Jobber 2004).

![Figure 9. The marketing mix.](image)

7.2.10.1 Product
The product element involves decisions about what goods or services that should be offered to each group of customers. It also concerns brand names, packaging, guarantees and services provided.

A product may be defined as a set of benefits that works as a solution to the customers needs and wants (Dwyer et al 2006). It consist of a "core product", that is the tangible item or the service offered by the company. If there is additional features that are customised for each customer, this belongs to the "augmented product".

7.2.10.2 Price
This is the key element in the marketing mix, because it represents incomes and decides how much the company will receive for the product marketed. All other elements represents costs.

There are four main strategies for setting prices, these are illustrated in the following matrix:
Economy pricing is a strategy to keep marketing and manufacturing costs low, and target price-sensitive buyers. Penetration pricing is to set an initially low price to gain a market share and then raise when this is achieved. Skimming is a strategy to charge high prices when you have a temporary competitive advantage. However, this is not a sustainable strategy. Premium pricing can be used when you can offer a competitive advantage that lasts. For example this strategy can be applied to luxury goods or high technology products.

Besides these main pricing strategies, there are several other important approaches to pricing:

- **Loss-leader**: This strategy is to sell the product to a low price, and sometimes even accept a loss in order to attract other customers.

- **Promotional pricing**: This is when a product is sold in order to promote another product.

- **Bundle products**: In a market of low competition, suppliers have the opportunity of product tying. This is when the customer is in great need of a product or service that the supplier can add on another product and thereby raises sales.

- **Price discrimination**: This means that prices are adapted for each customer to maximise the profit.

- **Commission pricing**: This could be to invoice a share of the economic value generated to the customer.

- **Optional extras**: To further maximise sales, optional extras can be offered. This could be special product features or maybe warranties or ensurances.

### 7.2.10.3 Promotion

This element is the tool to make customers aware of the product offered. All the promotional tools has their own benefits and drawbacks, for example, advertising can reach a large audience with a relatively small cost. On the other hand, it is a standardised way to communicate and might not be as efficient as personal selling.

Examples of promotional tools are:

- Internet websites
- Advertising
- Direct marketing
- Personal Selling
- Sales promotions
- Public relations

### 7.2.10.4 Place

Decisions about the place is such as distributions channels, transportation methods and inventory levels. This is important factors to manage in order to be cost efficient. Another objective with the planning of these factors is to make sure that products and services are available in the proper quantities, at the right time and place.
8 Frame of reference

This chapter describes how the problem area is attached to the theoretic models, and the chronological order of the empirical investigation in order to draw conclusions. The operationalization specifies the methods to measure each concept.

8.1 RQ1:
What strategy is optimal for launching the Deltaformer™ upgrade on the market?

The answer to this research question will define what actions MP should undertake concerning marketing and organisational issues. It will also specify which machines or customer that should be the primary target.

8.2 RQ2:
How can the Deltaformer™ product contribute to the product portfolio in terms of customer value, sales and profitability?

The second research question examines the potential of the product, both from the perspective of MP and from the customers point of view. The answer will include an overview of customers available, a sales and profitability forecast and an estimated payback period for the customer.

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Figure 11. Frame of reference model.
Identification and analysis of catalysts will be covered in diverse sections of the model, for example catalysts concerning; variables for segmentation, risks and value-creating factors. Accordingly there is no need to analyse catalysts in a separate section, so a revised model will be used;

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Figure 12. Revised frame of reference model.
Table 2. Operationalization from the frame of reference.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Conceptual definition</th>
<th>Operational definition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem</td>
<td>Difference between current state and desired state of business</td>
<td>• Strategic gaps</td>
<td>Quantitative</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Size of market</td>
</tr>
<tr>
<td>Choice</td>
<td>Possible options for distributing marketing resources</td>
<td>• Segments</td>
<td>Descriptive</td>
</tr>
<tr>
<td>Value</td>
<td>Value generated in terms of customer value and profit</td>
<td>• Payback period</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Expected sales and profit</td>
<td>Monetary value</td>
</tr>
<tr>
<td>Time constraint</td>
<td>Defines the time horizon, limitations and timing of the project</td>
<td>• Restraining factors</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Descriptive</td>
</tr>
<tr>
<td>Sacrifice</td>
<td>Defines what we have to give up and how this relates to the output</td>
<td>• Specific costs</td>
<td>Monetary value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Descriptive</td>
</tr>
<tr>
<td>Risk</td>
<td>Examines what can hinder the achievement of the project goal</td>
<td>• Country risk</td>
<td>Risk rates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Competitive risk</td>
<td>Descriptive</td>
</tr>
<tr>
<td>Catalysts</td>
<td>Defines the factors influencing the potential of the opportunity</td>
<td>• Factors</td>
<td>Descriptive</td>
</tr>
<tr>
<td>Possibility to regret</td>
<td>The extent to which the project can be withdrawn if it fails</td>
<td>• Sunk costs</td>
<td>Monetary value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Descriptive</td>
</tr>
<tr>
<td>Evaluation of</td>
<td>Summarises the strengths, weaknesses opportunities and threats</td>
<td>• Strategies</td>
<td>Descriptive</td>
</tr>
<tr>
<td>opportunity</td>
<td></td>
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</tbody>
</table>
9 Method

In this chapter, the research method will be outlined. Starting with the purpose, literature and then concluding the research approach. Further on, the strategy and the most appropriate data collection method will be described, and the problem with validity and reliability discussed. Moreover, the targeted company of this case study is justified.

9.1 Purpose

The purpose of studies can be divided into a threefold classification. These are; exploratory, descriptive and explanatory, but you can employ more than one of these purposes in your research project, according to Robson (2002). Exploratory studies have the purpose to find new insights, and to clarify the understanding of a problem. The great advantage of this type of study is its flexibility. The data may show that it is necessary to change direction, and this is easily done in exploratory studies. Descriptive studies have the purpose to portray an accurate profile of a situation. In this case, it is important to have a clear picture of the phenomena and its theory before collecting data. This type of study may be a part of the exploratory research. Explanatory studies seek to establish causal relationships between different variables. In the case of quantitative data, this is often further investigated with statistical correlation tests. (Saunders et al 2003)

The intention of this report is to portray a picture of Metso’s new business opportunity as it relates to existing theories. The purpose of the study is thereby descriptive. Area researched is Business planning, also called strategic planning, with a focus on new business opportunities.

9.2 Literature

According to Saunders (2003), the research process should, after clarifying the topic, continue with a critical overview of the literature. The purpose of this is to conclude the existing knowledge of the research area, and further on define the research questions. To pursue this step, I searched the LUCIA database of Luleå university library, the Emerald article database and the Global insight database. The lead words used were business planning, strategic planning, opportunity, and industrial segmentation. My own literature from basic marketing courses was also reviewed.

9.3 Research approach

Saunders (2003) portrays two different approaches to research. You could use either the deductive approach, where you develop a theory and a hypothesis, and design the strategy to test your hypothesis. Or the inductive approach, where you collect data, and develop a theory as a result of your data analysis.

Denscombe (2000) describes two other dimensions of research approach, the quantitative and the qualitative. The quantitative approach focuses on analysing measurable parameters, while the qualitative approach seeks to portray a situation, not necessarily as it is, but how it is perceived.

The approach to this report will be deductive. I will start from existing theories of business planning and examining opportunities and then relate these theories to the empirical investigation of my specific case.

As previously mentioned, it is hard to achieve quantitative measures of business opportunities. The study will be quantitative to the extent of which it is possible. For example, customer value and expected sales, profit and time limits will be estimated. Other factors will be described in a qualitative manner.
9.4 Research strategy
There are several different research strategies that can be applied to a research project. None of them can be considered the best way. Denscombe (2000) means that the most appropriate strategy depends on what type of research questions that will be examined. This is the research strategies considered by Saunders:
- Experiment; Classic form of research on a small number of variables and control of other variables.
- Survey; Collection of a large amount of standardised data in an economical way
- Case study; Empirical investigation answering the questions; Why? What? How?
- Grounded theory; Theory building from observations, and testing of these theories.
- Ethnography; interpreting the social world of the research subjects into the way they interpret it.
- Action research; Collaboration between researchers and practitioners, and with emphasis to change.

Robson (2002) defines a case study as “a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence”. This report will be a case study and the investigation object will be examining a new business opportunity for Metso Paper.

9.5 Sample selection
There are two types of sampling techniques available: probability sampling and non-probability sampling. The first type is samples selected from a known population, which means that it is possible to statistically estimate the characteristics of the population. For the other type you may still be able to generalise, but not on statistical grounds.

In this case non-probability sampling is used. More specifically, convenience sampling is used, which means that a case is selected because of the ease to obtain it. However, this case is intended to represent the total population. The sampling frame is defined as; companies in need of business planning when facing new opportunities. This is a very broad frame which means that the sample company should not have special characteristics.

Metso as a company seems to be an adequate sample. It is a mature company, operating on a wide scope in a global market. This eliminates influence from differentiated businesses, local conditions and evolving company structures. The new opportunity has risen from technological development which can be considered a common circumstance.

9.6 Data collection
There are two main types of data that can be used in a research project; Primary data and secondary data. Secondary data is information that someone else has collected for some other purpose, and primary data is information that you have gathered specifically for the project you have undertaken. In this study, both primary and secondary data will be used. If there is available secondary data, this will be used to save resources. Additional data will be collected from primary sources.

Primary data can be collected by observations, interviews or questionnaires. Observation involves recording and description of behaviours. An interview is a purposeful discussion that helps you gather valid and reliable data. A questionnaire is type of data collection where the respondent is asked to respond to a specified set of questions in a predetermined order.

Secondary data can be documentary, multiple-source or survey-data. Documentary data includes written documents and also tape or video-recordings. Survey based data is usually questionnaire data that have already been analysed for another purposes. Multiple-source data are several data sets that have been combined two form a new set. A common example of this is compilations of company information (Saunders et al 2003).
The primary data will be collected by continuous interviews for the internal data of Metso Paper. Data about the market and customer information will be collected through Metso paper employees in close contact to customers. Secondary data will involve multiple sources like country analysis and company databases. Moreover documentary data like websites and scientific reports will be used.

9.7 Validity and reliability

Validity means that what you research is really what you intend to research. Reliability is how confident you can be with the data, in other words if you would get the same result from a new identical investigation.

Concerning validity, it must be ensured that the theory employed is appropriate for our purpose and that we really catch the factors that are relevant for our research area.

Reliability problems can be caused by bad communication in interviews or employing the wrong source of information. We must also consider the objectiveness of the respondent.

In this study, I have encountered challenges concerning reliability of sources and access to data. One problem was estimation of figures concerning the product performance, where the answers differed between sources. Another issue was that some data was difficult to collect due to cultural differences. This is discussed more specific in chapter 13.
10 Empiri och Analys

In this chapter the characteristics and applications of the product will be reviewed. To gain understanding of the prerequisites, the process and product features will be introduced. A brief description of the current pulp market situation will be done. The tools from the theory section will then be applied to outline the best way to approach the customers.

10.1 The chemical pulping process

Wood consists of 20-30% lignin, cellulose, hemicellulose and extractives. To produce chemical pulp, starting with input of processed wood chips, the modern pulping process consist of five main steps:

1. Digestion (Cooking)
2. Screening
3. Brown stock washing
4. Oxygen delignification
5. Bleaching

![Figure 13. Pulp production in general.](www.metsopaper.com)

The product in this study is applicable on washpresses in the brown stock washing and after the oxygen delignification stage.

Cost efficiency in chemical pulping is closely connected to efficient washing. Generally, the need for efficient washing is highest close to the cooking plant where the COD (lignin) content is highest (Nordgaard 2007), but there is generally a need for two wash presses both in the brown stock washing and the post oxygen washing stages (www.tappsa.co.za). COD is an abbreviation of “chemical oxygen demand” and is a measure of organic pollutants in water.

10.1.1 Washing process

The function of this type of rollpress manufactured by Metso is to dewater the pulp and also wash COD out of it between different bleaching stages. By increasing the washing efficiency and thereby decrease COD levels, the chemical consumption will decrease in the following bleaching stages. The difference between the rollpress and other washing machines is the high outlet consistency that leads to less than half of the wash fluid consumption in comparison to a drum washer (www.tappsa.co.za).
The pulp is fed to the inlet where it is evenly distributed along the rolls. The both rolls are synchronised by two gearwheels, because it is important that they have the same velocity. In the first dewatering zone, the pulp is pressed to about 8-12% consistency. Washing fluid is sprayed at the pulp to remove chemicals through the roll surface. The final dewatering is done when the pulp passes the press nip between the two rolls. The consistency is then up to 40%. The dewatering efficiency is a combination of the roll momentum, distance between the rolls, the temperature and quality of the pulp (Nilsson 2007).

Figure 14. Pulp flow through the Twinroll™ press. (www.metsopaper.com)

The Twinroll™ press is available is different sizes and materials. The model name denotes the function of the machine and the size of the rolls, for example the DPA1255 that is included in this study:

Figure 15. Twinroll™ model denotification.

10.1.2 History

Metso paper has been manufacturing Twinroll™ presses since 1954, when the first MPC and VPC-presses was introduced. During the 60s the technique was refined and developed for higher capacities. In the 70s oxygen delignification was generally accepted to reduce the use of chlorine in bleaching. This method demands a higher pulp consistency and because of this the Twinroll presses became popular serving as dewatering presses before the bleaching stage.

Figure 16. Evolution of the Twinroll™ presses. (www.metsopaper.com)
Due to demand for increased capacity and improved washing efficiency, the FPB/DPA generation was developed which combines washing and pressing in a common step. The technology introduced was to replace the previous fluid with a washing fluid that improves washing efficiency. During the 80s the rollpresses were produced in even bigger sizes, mainly due to North American customer’s demand for more capacity. The presses earlier measuring 900mm diameter and 3.5-4m in length now became as large as 1500mm and 7.2m in length. In the 90s the capacity continuously increased and presses was developed to handle higher pulp consistencies. This led to an almost doubled production capacity and resulted in the third generation Twinrolls™ – DPB. Sales increased heavily during this period and with new experiences and feedback from customers, the fourth generation was developed – TRP. This press has a completely new design and several features increasing capacity and washing efficiency. The new design is modularised to simplify the construction and shorten the lead times. This has also reduced the number of available sizes from five to three. Today Twinroll™ presses is used wherever in the process efficient washing and dewatering is needed and the are more than 1000 presses installed (Metso intranet).

10.1.3 Description of the Deltaformer™ upgrade

The DPA press is constructed for high washing efficiency and low inlet consistency. This makes the DPA optimal as the first washpress after the screening process. As the output from the first press has a higher consistency, it is in contrary more efficient to have a rollpress that can handle high consistency pulp in the second stage. Many customers however, have old DPA presses there so if the DPA presses can be rebuilt to MC feed, the production will be more efficient (www.metso.com). In addition, improved washing efficiency before the oxygen delignification stage, reduces demand for oxygen gas and thereby preserves the strength of fibres. To reduce COD carryover to the bleaching plant, it is crucial to achieve good washing efficiency in the post-oxygen stage, so this is also an attractive position of this upgrade.

The figure below shows how the pulp mat formation affects washing efficiency under normal conditions, and as a reference, a trial was done on a DPA-press.
The pulp mat formation and even distribution are the critical factors for high washing efficiency. The DPA press is from the beginning equipped with an inlet box with decreasing cross-section area to maintain a constant velocity in the inlet along the entire roll (see figure 17). The increased importance of cost-efficiency has forced customers to raise the inlet pulp consistency above the recommended levels. Consequently, customers will experience problems with uneven distribution and plugged inlet boxes. These problems are most significant on presses featuring high ratios between roll length and diameter, e.g. sizes 945, 1255 and 1572. The purposes of the upgrade are to rebuild the rollpress to medium consistency feed (6-7% pulp consistency) and improve the pulp mat formation. This is done by replacing the inlet boxes with four (or five) separate Deltaformer™ on each side that is controlled by valves and flowmeters. The rebuild also demands a change of the blow tank after the oxygen delignification stage and the pulp tower before the second press if the inlet consistency is to be raised. In most cases it is also necessary to replace the feeding pump to adjust for medium consistencies. The column at the wash fluid inlet could be replaced by a spraying bar at the older DPA models to further increase washing efficiency. The initial purpose of the column was to prevent the wash fluid from damaging the pulp mat, but further test showed that this was unnecessary (Wessbladh 2007). Benefits following this upgrade are increased capacity and improved washing efficiency. Deltaformer™ is mounted as a standard component at the 900 Twinroll™ series since 2004. In the figure below, the piping construction is shown and also the “Delta technology” column that distributes the pulp to the roll surface.

There are actually two possible applications for the Deltaformer upgrade, with different scopes of rebuild;

1. Full scope upgrade to MC feed that in addition to the Deltaformers includes installation of MC pump and standpipe to handle higher consistencies. Benefits are higher production capacity, reduced risk of plugged inlets, improved pulp mat formation and thereby washing efficiency resulting in savings from chlorine consumption or oxygen delignification demand. This upgrade presumes that the washpress is a bottleneck and that higher capacity leads to higher total production in the pulping line.

2. Small scope upgrade without intentions to raise capacity and production volumes. This means still low consistency pulp, but in contrary no need for a standpipe or MC pump. Benefits are reduced tendency of plugged inlets and better pulp mat formation, which is critical for washing efficiency.

The performance factors like pulp mat formation and plugging tendency is dependent on the fibre length of the raw material (Nilsson 2007). This means the reasons for upgrading and the resulting
performance varies between customers with different fibre supply. Emission allowances can also limit
the output capacity so there has to be a balance between pulp consistency to maximise output, and
washing efficiency to reduce emissions.

The scope of supply provided by Metso ranges from single machines with "basic engineering"
instructions to full turnkey projects that includes dismantling of old equipment, civil engineering and
training. In this study, only main machinery and basic engineering will be included.

Benefits from the upgrade:
- Production capacity can increase by up to 50% that could remove bottlenecks and thereby
generate additional profits.
- Improves washing efficiency in the post-oxygen stage which reduces COD carryover and thereby
chlorine consumption in the bleaching stage with up to 30%.
- Improved washing efficiency before oxygen delignification that minimizes oxygen gas demand
and preserves fibre strength.
- Reduces maintenance downtime

10.2 The Metso Paper organisation

The Deltaformer™ product is managed from the Sundsvall Processes services center. More specifically
there is a department for improvement products and upgrades.

10.2.1 Sales

Metso’s sales people are located in local departments all over the world. The products are classified in
two categories; "released for sales" or "not released for sales". Those not released for sales are such
where specifications and quotations have to be adapted for each customer. These cannot be sold
directly by the sales personnel. Instead, their task is to take up leads and forward these to a "product
manager". The Deltaformer™ is of such characteristics that it will not be released for sales (Wessbladh
2007). In this case the product manager will be situated at the "Sundsvall Service Center", which
means there has to be cross-functional communication. The product managers should also promote the
sales personnel and provide technical support.
10.3 Market analysis

The presence of the emerging markets is causing low returns for traditional regions (North America, Western Europe and Japan). This affects capital allocation decisions by producers as well as external investor’s decisions (PWC 2007).

The Latin American market pulp producers enjoys low fibre and labour costs. They are expected to continue to take market share from the higher-cost North American producers (Pulp & Paper 2005). While North America has a high share of labour and energy costs, Scandinavia and the rest of Europe has high fibre supply cost. Asia Pacific has low production costs (www.paperage.com).

![Figure 20. Manufacturing costs of BHKP.](Metso intranet)

The graph above reveals the global manufacturing costs structure. What can be concluded from this is that the low-cost producers in South America and Asia could achieve doubled profits compared to the high-cost producers in Western Europe. Following this they will also achieve much shorter payback periods when it comes to investment in capacity expansions.

Mergers and acquisitions increases, especially in the emerging markets and North America. The former vertically integrated companies tend to divest its non-core businesses (PWC 2007). Metso concluded in their 2006 annual report the most significant risks related to the P&P area to be: business cycles, ability to grow in the emerging markets, difficulties in Europe and North America. Producers in the mature markets are now focusing on reducing costs, energy consumption and effluent levels (Lauritzen 2007).

Comparing virgin woodpulp production data and the actual GDP of the World shows a slight correlation between the graphs. The downturns are located in the years 1998 and 2001. Looking at different regions, this correlation is most significant in North America and the Nordic countries, while most emerging countries remain steady during depression.
Following this, we might expect that an upcoming recession could affect demand, certainly in the mature markets.

According to the UNECE (2007) production, consumption and trade with paper and pulp continues to grow in Europe and Russia, but fell in North America during 2006 and early 2007. PWC (2007) also claims that demand is declining in North America and stable in Europe. The North American problem is not only caused by surplus capacity, but also lack of competitiveness due to shortage of reinvestments. Globalisation has given the emerging markets access to capital and thereby world-class technology that allows the short fibre to compete with the northern-hemisphere fibres. The emerging markets are expected to continue their growth at double the rates of Western Europe (Suckling 2006). In the last years, Japan and China has expanded their capacity and become significant export countries. To deal with over capacity, the domestic demand has to catch up. In south and Southeast Asia, the demand is growing fast, with India in the front and Indonesia and Malaysia as the fibre baskets for the region. Due to cheap fast-growing fibres and low costs, Latin America is expected to grow fast and become a truly global player in the coming years (PWC 2007).

Pulp demand is derived from paper and board demand. The world demand for paper and board is expected to grow by an average 2.1% per year until 2020. The fastest growth will be in China, the rest of Asia, Eastern Europe, Middle east, Africa and Latin America (Jaakko Pöyry 2005).
Jaakko Pöyry’s demand forecast portrays an annual growth rate of 3-5% percent in Eastern Europe, Middle East, Asia and Latin America. Regions with less than 1% annual growth forecasted are North America, Western Europe and Japan. What has to be noticed is that Europe has about 60% share of imports in total consumption mainly due to the Nordic countries (See Figure 23). In other words, the emerging countries will demand expanded capacity, and the Nordic countries could possibly raise sales if the domestic production gains competitive strength.

![Figure 22. Demand growth for paper and paperboard 2000-2020 (Jakko Pöyry 2005).](image)

The key factors for determining where investments will be made is; energy price, market and raw material (Andritz annual report 2006). This is clearly shown in the diagram below, supported by the cost global manufacturing costs in figure 20. Most of all new chemical pulp capacity is built in the emerging markets.

![Figure 23. Import as a percentage of total pulp consumption. (PWC 2007)](image)

The P&P market is in a change towards more cheap capacity in the emerging market regions, with cheap fibre supply from Latin America and Asia. Traditional producing regions continues to battle to earn its cost of capital.

![Figure 24. New chemical pulp capacity 2003-2005. (Metso intranet)](image)
Demand for more capacity is derived from demand of paper products. This relies heavily on the business cycles, but high growth in emerging markets can anyway demand expanded production. According to Konjunkturinstitutet (www.konj.se), the world economies are starting to stagnate. This might further affect high cost producers and force restructuring of inefficient production facilities. Restructuring actions means sales opportunities when customers seek to concentrate and maximise production in an existing plant. Investments in other parts of the production line can also create bottlenecks in washpress stages or chemical recovery plants and thereby call for an upgrade.

Figure 25. Capital investment as a percentage of depreciation, top 100 largest forest, paper and packaging companies. (PWC 2007)

The ratio above can be seen as the extent of which capital investments is replacing aging assets. A ratio above 1.0 indicates expansion of capacity. In 2006, only Latin America, Japan and Asia/pacific groups exceeded 1.0.

Figure 26.Latin America – capital expenditures % of depreciation (Pöyrö 2007)

The figure above contains the same type data as Figure 25, but expressed in a percentage value. A value over 100% means that investments exceeds depreciations. The figure concludes that some Latin American companies have made heavy investments recently. Historical production figures shows that
these producers however seeks to expand capacity continuously, and economies of scale is the key to profitability, so further investments are to be expected.

To sum up this market review, one could say that Latin American producers seems to have the most beneficial production conditions, both from historical and forecasted figures.

**10.4 The context of opportunity**

10.4.1 Problem

Metso’s 2007 strategy review concluded an extended focus on the service businesses. The Service centre’s mission is an annual growth of 10 % and 30 % of sales generated from improvements and agreements (www.metsopaper.com). In order to meet these objectives, Metso have to spot new business opportunities in this area, in other words develop new products. The Deltaformer product is one such new product and in this section the potential will be discovered.

We consider the Gap analysis equation:

\[
\text{Market potential} = \text{Usage gap} + \text{Existing usage}
\]

There are 464 producers of chemical pulp in the world (Jaakko Pöyrö 2007). As the product is applicable on the type of washpress Twinroll DPA 915-1872, available machines are according to MPs internal database:

\[
\text{Market potential} = 244
\]

To calculate the Existing usage, we must assess the four elements. As the product is not yet officially launched, there are no current sales and needless to say, the existing sales are:

\[
\text{Existing sales} = 0
\]

However, there have been negotiations with a few customers and one upgrade is quoted to a customer in Europe.

The distribution gap refers to customers that are not possible to reach, for example geographical regions, or certain distribution channels. In this product’s market there are customers that have idled or closed down their plants, which means no sales are possible. These machines must be traced, as they can generate sales in the future.

\[
\text{Distribution gap} = 7
\]

These seven machines are located in “Stora Enso Norrsundet mill”, “Rottneros Utansjö mill” and “Tembec Smooth rock falls”.

The product gap is the share of market from which the organisation is excluded because of product characteristics. This may be a segment where Metso doesn’t offer a product or customers where the product is not applicable. As MP has a global distribution network, all customers can be supplied, but important to mention, some customer may be temporary unavailable due to conflicts in the country. The product is applicable on all the machines listed as the total market potential, even though customer benefits may differ.

\[
\text{Product gap} = 0
\]

The competitive gap is the share of market held by competitive offerings. This share is affected by factors such as price and promotion. In this case there are machines upgraded with the Niagara™ inlet box, and also rebuilt with the Paraformer™ system. To assess these machines, the product must clearly show an additional value to the customer.

\[
\text{Competitive gap} = 11
\]
The Niagara™ inlet box is installed at the Swedish sites Husum, Korsnäs, Karlsborg, Mörrum, The Czech producer Biocel Paskow and at the South American plants Aracruz and Cenibra Belo Oriente.

Adding up these four gaps, results in the existing usage of the product:

**Existing usage = Existing sales + Distribution gap + Product gap + Competitive gap**  (10)

(6), (7), (8), and (9) in equation (10) gives:

**Existing usage = 0 + 7 + 0 + 11 = 18**  \( (11) \)

(5) and (10) in equation (4) gives:

**Usage gap = Market potential – Existing usage = 244 – 18 = 226**  \( (12) \)

The gap analysis shows that 226 out of 244 targeted machines are currently available. This provides a 93% usage gap in the market to be filled. The following analysis however, may call for excluding more of these potential upgrades.
To visualise the geographic location of the installed base, I have plotted each location on the world map, and the figures represents the number of presses in each region:

**Figure 27. The installed base plotted on the world map.**

This figure shows that Scandinavia and North America are large markets. Asia is also a large market, that comprises some customers with a large amount of machines.

### 10.4.2 Choice – Segmentation of markets

The following bases for segmentation have been identified:

- **Product segments;**
  The product features, performance and thereby price level can vary depending on the customers needs. These needs relate either to increased capacity, reduced costs and environmental friendliness.

  As described in section 10.1.3 the product can be sold in different scopes. The extended scope will probably be demanded by customers that wants to expand the capacity of the rollpress. The more basic scope relates to cost reductions and environmental friendliness.

  The product can also be bundled with extra options such as commissioning and start-up assistance. This is considered independently of the customers characteristics.

- **Buyer segments;**
  Customers differ in size of both company and machinery, which can indicate potential order sizes. There are a few positions in each line that is especially interesting for upgrading. There is also a possibility of differences in ownership, which affects the company strategies and thereby investment decisions. For example, in a privately owned company, stockholders require profitability and may care less about environmental issues. A country government, on the other hand, may have more of an environmental responsibility. Another important factor is the profitability of companies. This can indicate the possibilities of making investments in the future, and also if it is profitable to expand production. Furthermore, some customers may be risky sales as they have low credit rates.
• **Channel segments;**
The direct selling distribution channel used by MP is non-exclusive. This means that a new entrant on the market could compete through the same distribution channel. On the other hand, there are no known close substitutes to the product in this moment. Accordingly, there are no threats from other channel strategies. However, intermediaries in the value chain could not possibly provide competitive benefits such as lower prices anyway. The fact that Metso is the manufacturer of the target machines for this upgrade provides advantages in the distribution as well. Since no alternative distribution channels are of interest, customers will not be segmented from this base.

• **Geographic segments;**
Customers in different geographic locations differ in raw material, energy and labour costs, which affects their profitability and ability to keep prices low. This will furthermore affect the demand for their products and incentives to expand production. These factors will be denoted “production resources” in this segmentation. There are also differences in demand depending on the growth of domestic demand. As mentioned in the market analysis, there are big differences in growth between the emerging countries and the western world.

The risk of doing business also distinguishes the countries. This is apparent especially in countries with primitive ruling systems and dictatorships.

The pulp raw material properties also differ between countries, both concerning sufficiency for use in different pulp products and how they affect the conditions in the production process. However this has no significant impact on the motives for upgrading (Fernström 2007). As the tangible product is delivered from Sundsvall, freight costs also differ between regions but this is excluded in the financial appraisals to limit the complexity of the problem.

As most of these variables seems to relate to geographical regions rather than specific customers, the country will be the main segmentation variable. The countries will be segmented from the following variables:

- Risk; high or low
- Demand forecast; high or low
- Production resources; Cheap or expensive
- Size (number of machines); large or small
- Profitability of customers; high or low
- Financial stability of customers; high or low

Growth ratios are collected from Jaakko Pöyrö’s forecast of growth per region. A ratio below 1%/yr is considered low growth.

Net profit margins are collected from Jakko Pöyrö’s smart terminal (www.jpsmartterminal.com) and Infinancials corporate focus screener (www.infinancials.com). The level is chosen from a peer group of similar companies in this database where the median net profit margin is 3,91%

Solidity ratios are also collected from the previous mentioned databases and the critical level is chosen to be 25% since this is a common criteria used by banks for giving long term mortgages.

Risk ratios are collected from Global Insights database. A low level is chosen to be below 2.0 since the risk is then considered to be “low”, “negligible” or even “insignificant”.

Production costs are based on the average BSKP manufacturing cost per region, where costs below 400USD is considered low costs.

Plotting each country in a matrix chart helps to identify segments and determine strategies for different categories. Evaluations of variables can be seen in the appendix.
<table>
<thead>
<tr>
<th>High risk</th>
<th>Few presses</th>
<th>Low solidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk</td>
<td>Few presses</td>
<td>Low solidity</td>
</tr>
<tr>
<td>High risk</td>
<td>Many presses</td>
<td>Low solidity</td>
</tr>
<tr>
<td>Low risk</td>
<td>Many presses</td>
<td>Low solidity</td>
</tr>
<tr>
<td>High risk</td>
<td>Few presses</td>
<td>High solidity</td>
</tr>
<tr>
<td>Low risk</td>
<td>Few presses</td>
<td>High solidity</td>
</tr>
<tr>
<td>High risk</td>
<td>Many presses</td>
<td>High solidity</td>
</tr>
<tr>
<td>Low risk</td>
<td>Many presses</td>
<td>High solidity</td>
</tr>
<tr>
<td>High growth</td>
<td>High PM Cheap-production</td>
<td>Low growth</td>
</tr>
<tr>
<td>High growth</td>
<td>Low PM Expensive production</td>
<td>Low growth</td>
</tr>
<tr>
<td>Low growth</td>
<td>High PM Cheap-production</td>
<td>Low growth</td>
</tr>
<tr>
<td>Low growth</td>
<td>High PM Expensive production</td>
<td>Low growth</td>
</tr>
<tr>
<td>Low growth</td>
<td>Low PM Expensive production</td>
<td>Low growth</td>
</tr>
<tr>
<td>Low growth</td>
<td>Low PM Expensive production</td>
<td>Low growth</td>
</tr>
</tbody>
</table>

**Figure 28. Segmentation matrix.**

The matrix visualises different segments of customers. Situated in the upper left corner are risky businesses in relation to potential sales. These however have strong motifs of expanding and shorter payoff times. Considering the time factor, the demand from these countries can become even stronger and risks decline, making them attractive customers. In the lower right corner are customers that have stable financial situations but tough conditions to generate profits. Sales arguments in this case are improved profitability and cost efficient production. In the lower left corner are profitable customers with beneficial conditions. These will probably seek to expand capacity.

The segmentation shows very clear distinctions between different regions when it comes to profitability, size and solidity. Generally speaking, small size customers are located in central Europe, Asia and Africa, while customers in Scandinavia, South America and North America in average has more machines per customer.

The most profitable mills seem to be located in areas of emerging markets. These customers also have high solidity, but most mills seem to be fairly financially stable with a few exceptions in Scandinavia and North America.
10.4.3 Value

10.4.3.1 Value to the customer

Since the factors determining customer value differ between customers, four cases will be used representing different motifs. The calculations will be applied on a DPA1255 washpress. This case will refer to the last press before the bleach-plant (post-oxygen washing stage), which means that the main benefits are increased capacity and reduced chemical consumption. The cases represent different purposes; maximising production volumes, or minimising effluent levels and thereby chemical consumption.

The investment costs are approximately 4 MSEK for a small scope upgrade and 7 MSEK for a full scope upgrade (Fernström 2007). With the extended rebuild, capacity could be raised to higher levels and washing will be improved at the same time. In addition, washing will be more efficient at high pulp consistency feed. The original production conditions in this case are assumed to be the following:

- Production level is 1400 adt/d, equivalent to 1260 odt/d
- Inlet pulp consistency is 3.5 %
- Outlet pulp consistency is 30 %
- The \(E_{10}\) factor is 3.5
- Dilution factor is 2.0
- COD carryover to the bleach plant is estimated to 12 kgs/tonne

In addition, the following assumption are made:

- It takes 0.6 kgs chlorine to bleach out 1 kg of COD to expected levels.
- Price of Chlorine is approximately 3.5 SEK/kg
- The profit margin of pulp is an estimated 1000 SEK/tonne (Sweden)
- The DPA1255 has a hydraulic capacity limit of 1600 adt/d (Danielsson 2008)
- Production days per year is 350

**Payback time is calculated as:**

\[
Paybacktime = \frac{Initial\text{ investment cost}}{Annual\text{ cashflow generated}}
\]  

(13)

These are the four cases:

**Case 1:**

In this application, the upgrade has no intentions to increase capacity. The Deltaformer™ is installed without additional rebuilds and the conditions for production are unchanged. As a result of improved washing efficiency, the \(E_{10}\) factor is raised from 3.5 to 4.6 and the COD carryover is reduced by 30 % equivalent to 4 kgs/tonne (Andersson 2008).

- Production 1400 adt/d = 1260 odt/d
- Inlet consistency 3.5 %
- Outlet consistency 30 %
- \(E_{10}\) factor 4.6
- COD carryover 8 kgs/tonne

**Savings from reduced chlorine consumption:**

\[
A \times B \times C \times D \times E = 4 \times 0.6 \times 3.5 \times 1.260 \times 350 = 3.704.400 \text{ SEK / year}
\]  

(14)
A = COD reduction in kgs per tonne
B = Chlorine consumption per kg COD
C = Chlorine cost per kg
D = Production (tonnes per day)
E = Production days per year

Investment costs = 4.000.000 SEK  \hspace{1cm} (15)

(14) och (15) i (13) ger:

\[
\frac{4.000.000}{3.704.400} = 1,079 \text{ years} = 378 \text{ days}
\]  \hspace{1cm} (16)

**Case 2a:**

Customers suffering from a bottleneck in a washpress stage can, with this rebuild increase pulp flow through the press and thereby the production volumes. With 4% lower outgoing consistency, pulp flow can be increased with 200 adt/d. With improved washing efficiency following the upgrade, \( E_{10} \) factor is raised from 3.5 to 4.0 and as a result, COD carryover is decreased with 2 kgs/tonne (Andersson 2008).

- Production 1600 adt/d = 1440 odt/d
- Inlet consistency 3.5 %
- Outlet consistency 26 %
- \( E_{10} \) factor 4.0
- COD carryover 10 kgs/tonne

\[
A \times B \times C \times D \times E = 2 \times 0.6 \times 3.5 \times 1.440 \times 350 = 2.116.800 \text{ SEK/year} \]  \hspace{1cm} (17)

\[
F \times G \times H = 180 \times 350 \times 1.000 = 63.000.000 \text{ SEK/year} \]  \hspace{1cm} (18)

F = Production increase (adt/d)
G = Annual days of production
H = Profit margin per ton

Investment costs = 4.000.000 SEK  \hspace{1cm} (19)

(17), (18) och (19) i (13) ger:

\[
\frac{4.000.000}{2.116.800 + 63.000.000} = 0.061 \text{ years} = 22 \text{ days}
\]  \hspace{1cm} (20)
**Case 2b:**

Another way to increase production volumes is to raise the inlet pulp consistency. By raising inlet consistency with 0.5 % capacity can increase with 200 adt/d. It presumes however, that surrounding machinery can handle this levels. This solution will thereby not be applicable to all the target machines. With higher pulp consistency (not referring to High Consistency, HC), washing efficiency is further improved. The $E_{10}$ factor will be raised from 3,5 to 4,6 resulting in a reduction of chemical consumption by 30 % equivalent to 4kgs/tonne (Andersson 2008).

- Production 1600 adt/d = 1440 odt/d
- Inlet consistency 4 %
- Outlet consistency 30 %
- $E_{10}$ factor 4,6
- COD carryover 8 kgs/tonne

\[
A \times B \times C \times D \times E = 4 \times 0.6 \times 3.50 \times 1.440 \times 350 = 4.233.600 \text{SEK} / \text{year}
\] (21)

\[
F \times G \times H = 180 \times 350 \times 1.000 = 63.000.000 \text{SEK} / \text{year}
\] (22)

Investment costs = 4.000.000 SEK

(21), (22) och (23) i (13) ger:

\[
\frac{4.000.000}{(4.233.600 + 63.000.000)} = 0.059 \text{years} = 21 \text{days}
\] (24)

**Case 3:**

With a rebuild for MC feed, including a new feed pump and a standpipe mounted inside the blowtank, ingoing consistency can be raised to 7 %. This rebuild could nearly double the production volume, but the hydraulic system of a DPA1255 limits the capacity to 1600 adt/d. Accordingly, capacity can be raised with 200 adt/d in this case. The $E_{10}$ factor will be raised from 3,5 to 4,6 with 30 % reduced COD carryover (Andersson 2008).

- Production 1600 adt/d = 1440 odt/d
- Inlet consistency 7 %
- Outlet consistency 30 %
- $E_{10}$ factor 4,6
- COD carryover 8 kgs/tonne

\[
A \times B \times C \times D \times E = 4 \times 0.6 \times 3.50 \times 1.440 \times 350 = 4.233.600 \text{SEK} / \text{year}
\] (21)

\[
F \times G \times H = 180 \times 350 \times 1.000 = 63.000.000 \text{SEK} / \text{year}
\] (22)

Investment costs = 7.000.000 SEK

(21), (22) och (23) i (13) ger:

\[
\frac{7.000.000}{(4.233.600 + 63.000.000)} = 0.104 \text{years} = 37 \text{days}
\] (24)
Table 3. Deltaformer™ payback times

<table>
<thead>
<tr>
<th>Case</th>
<th>(1)</th>
<th>(2a)</th>
<th>(2b)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced downtime</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Increased operating window</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Improved washing efficiency</td>
<td>3.704.400</td>
<td>2.116.800</td>
<td>4.233.600</td>
<td>4.233.600</td>
</tr>
<tr>
<td>Increased capacity</td>
<td>-</td>
<td>63.000.000</td>
<td>63.000.000</td>
<td>63.000.000</td>
</tr>
<tr>
<td>Customer price</td>
<td>4 MSEK</td>
<td>4 MSEK</td>
<td>4 MSEK</td>
<td>7 MSEK</td>
</tr>
<tr>
<td>Payback time</td>
<td>378 days</td>
<td>22 days</td>
<td>21 days</td>
<td>37 days</td>
</tr>
</tbody>
</table>

Conclusions from these calculations are that improved washing efficiency can in itself provide a fair value to the customer related to the assumed prices. Upgrading for this reason would result in a payback time of slightly more than one year. Pulp mills in general, does not accept payback times exceeding two years (Ernerfeldt 2007). In addition, reduced chlorine consumption by up to 50% would be significant and interesting from an environmental perspective and could also remove bottlenecks in the chemical recovery plant.

What is even more interesting, is the potential to raise capacity. The occurrence of bottlenecks in the installed base of DPA rollpresses is not investigated in this study. What could be concluded though, is that even a small volume potential of 6-12adt/d could provide a neat payback period of one year. This is although depending on the customer’s profit margin per tonne produced.

The cashflow generated from the upgrade is actually the same in case 2b and 3, but the latter has a longer payback period as the investment costs are higher. Case 2b refers to raised inlet consistency in the existing equipment. This will, as previously mentioned, not be possible in all the plants included in this study.

In addition to the benefits described above, there are suspicions that the upgrade would result in less maintenance work and thereby reduced downtime for the whole machine. As a consequence of the increased capacity, there will also be a greater window of operation. These factors are not measurable prior to a pilot installation and will therefore be excluded in this study.

The payback periods shown in the calculations above is based on sales prices calculated from the cost of sales. These periods are extremely short and shows that the price is not proportional to the customer value created. A reasonable payback period would be around one year, so the sales price could be adjusted to this.

10.4.3.2 Value to the organisation

According to the Du Pont model, earnings divided by sales, results in the profit margin. In this case we have a fixed gross margin on each component, for example Metso components, piping and erection machinery. In this report, the gross margin is assumed to be 10%. The turnover is the total sales divided by total investment. The forecasted sales during a ten year period are 124.000.000 SEK and the total investment cost is 700.000

\[
Gross\ margin = 10\% = 0,10
\]  

\[
Turnover = \frac{Sales}{Total\ investment} = \frac{124,000,000}{700,000} = 177,1
\]
\[ \text{Return on Investment} = \text{Turnover} \times \text{Gross margin} = 177,1 \times 0,10 = 17,71 = 1771\% \]  \hspace{1cm} (26)

The forecasted ROI during the ten year of expected sales is 1771%

This is of course an incredible return on investment, but there are a lot of costs that can not be allocated to this project. The low investment cost however validates the competitive advantage due to high entry barriers.

10.5 The elements

10.5.1 Time constraints

Metso Paper can be considered a mature organisation in its core businesses. Mature organisations usually have longer planning horizons and the organisation life cycle will therefore override the other time constraints.

When analysing the time horizon, it is necessary to take into count how the segmentation variables change over time. The customer conditions for production may change in both directions and new segments can emerge or existing ones disappear.

Considering competitive risk that is connected to technological change, our product will be valuable as long as the customer value created is an acceptable standard in the industry. If the Deltaformer™ upgrade can be compared with the TRP press in terms of inlet pulp distribution performance, the product life cycle can be assumed equivalent to the TRP press. The rate of technological change of roll-presses has increased and the PLC been shortened from about 20 years with the first generation to less than 10 years with the third generation (www.metso.com). Shortening of the PLCs can be caused by stronger competition that fuels the search for competitive advantages. Increased competition in itself, is primarily caused by the globalisation of markets.

This implies that the PLC of the TRP press will at least not last longer than 10 years from now. It can be an implication for the PLC of our product, or at least the period it can compete with the option of a new press without discounted price parity. New technology would probably also create a market for second-hand presses, which can be, considered a competitive substitute to the Deltaformer. A time restraint that might be shortening the horizon is plagiarism from Asian manufacturers and applications from competitors. This underlines the importance of secrecy when sharing information to customers and even in this report.

The changes of environmental risk, might in the future favour markets that today should be avoided, and in contrast make operations in certain countries very risky.

![Figure 29. Overall risks by region. (www.globalinsight.com)](www.globalinsight.com)
The figure shows a slightly declining trend for most regions except North America. This can be expected to continue in line with globalisation and development of emerging markets. However, risks can appear very sudden as shown by the North American graph. This calls for continuous supervision of the markets.

### 10.5.2 Sacrifice

Deltaformer™ was originally developed as an evolution of the last generation Twinroll™ presses. The costs connected to this project are irrelevant in the context of this upgrade product. However there are costs for construction of the specific upgrade application and for evaluation of this product (Nordgaard 2007). This will be regarded in this cost compilation.

The only specific cost that can be connected to business planning are salary expenses. Other costs will be carried by the overall budget. The development of marketing materials always involves one promotional brochure and one powerpoint presentation.

When MP arranges sales seminars, they will pay for rental of conference rooms and meals, but customers will pay for their own travel and accommodation. However, foreign seminars will be more expensive due to travel and accommodation costs for MP personnel (Berggren 2008). In this estimation, there are included two seminars with target customers. One of these are held in Sweden and one in South America. The estimated cost for a seminar of 15 participants is ........ Arranging a seminar in South America will be estimated to cost twice as much.

New products will participate in exhibitions, trade shows and other events, usually 2-3 times per year. There are three events that according to Berggren (2008) is interesting for the Deltaformer™ upgrade:

- **SPCI (Svenska Pappers- och Cellulosaingenjörsföreningen)**: The world's largest exhibition for the pulp and paper industry in Stockholm, Sweden.
- **MP Technology days**: A global event for pulp and paper producers, rotating between North America, South America, Europe and Asia.
- **STC club (Service Technology Center)**: Gathering conference of pulp and paper producers from the Nordic countries.

Expenses for these events will neither be carried by a single product, but we will anyway estimate a specific cost for this product.

The activities of the sales people are financed by the overall sales budget, so this will not be connected to the specific product.

In the table below, specific costs for this project is estimated:

**Table 4. Costs connected to the Deltaformer™ project.**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost (SEK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction, Prototype installation and evaluation</td>
<td>xxxxxxxx</td>
</tr>
<tr>
<td>Business planning</td>
<td>xxxxxxxx</td>
</tr>
<tr>
<td>Marketing material</td>
<td>xxxxxxxx</td>
</tr>
<tr>
<td>2 x Sales seminars</td>
<td>xxxxxxxx</td>
</tr>
<tr>
<td>3 x trade shows</td>
<td>xxxxxxxx</td>
</tr>
<tr>
<td>Training programme for salespeople</td>
<td>xxxxxxxx</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>700,000-800,000</strong></td>
</tr>
</tbody>
</table>
10.5.3 Risk
At first, the risks in the business environment will be generally discussed. These risk rates will be used in the segmentation of customers. Secondly, the competitive risks will be analysed according to the Porter model of competitive industry structure.

10.5.3.1 Environmental risk – Country risk ratings

![Risk Index](image)

Figure 30. Average risk weighted by the number of installations in each country.

The average risk factor of the world, weighted by the number of installations in each country is less than 2. A risk factor of 2 would mean that there is a mature political system, which is probably a democracy. The country will welcome foreign investments and the government rarely intervenes in business operations. A stable economic programme exists, but major change could lie ahead. The country will have a reasonable effective law system. Tax systems will be reliable, although it may be still evolving. The majority of businesses will pay their dues. A few operational obstacles may occur, but the infrastructure will be well developed. Crimes will pose no serious risk to legitimate businesses.

The continent with the lowest risk is North America. Europe comes second, primarily due to a few high-risk countries like Russia, Hungary, Czech republic and Slovakia. By looking at only Scandinavia, which is actually more than 23% of the market, you can see that this a really low risk area.

10.5.3.2 Competitive risk -The Porter model of competitive industry structure

10.5.3.2.1 The threat of new entrants
The industry of pulping machinery is characterised by high capital requirements such as R&D, customer relationship management and manufacturing costs. Complex know-how is needed to enter the industry (EU commission IP/06/1100). A credible competitor would need a global distribution network, which requires certain economies of scale (Metso annual report 2006). Existing suppliers would be likely to respond on actions from new entrants. In others words there are high barriers to enter the pulping equipment industry (www.europa.eu).

The patent regulations are, according to Ernerfeldt (2007) very weak. There is a strong possibility that competitors can start upgrading Twinrolls, so an exclusive market can not be taken for granted. There are also Chinese manufacturers supplying plagiaries of rollpress technology machines. These are yet only available in low consistency feed, small sizes and only on the Chinese market, but larger sizes are coming so this can be a potential new entrant if they develop medium consistency presses. Customers however value well-established suppliers, so the main threat is from existing competitors in washing machines.
There are competitors present in both Europe and North America that can supply similar technologies as Metso Paper. It is reasonable to believe that these competitors could launch a substitute product to the Deltaformer™.

10.5.3.2.2 The bargaining power of buyers
Each customer holds a relatively large share of total market consumption, which means they have a large influence on the suppliers. However, the situation does not fit into the definition of high buyer power. There are thousands of potential customers of washing machines in the world and about 70 potential customers for the Deltaformer™ upgrade which means no single customer can significantly affect Metso’s profit negatively. In addition the difference in size between customers are not that significant to give certain priorities. The high entry barriers also make backward integration unprofitable and the presence of only a few suppliers also limits the buyer power.

10.5.3.2.3 The bargaining power of suppliers
Metso strong competitive position with only a few competitors and differentiated highly valued products strengthens their supplier power. On the other hand, there is always another full scope supplier available. (Metso annual report 2006). In the definition of supplier power, the market fits into an oligopoly scenario. This is when the concentration ratio is higher than 40 %. In this case, the three top players constitutes more than 90 % of the sold start-up capacity.

10.5.3.2.4 Threat of substitutes
The rational industrial buying behaviour makes the product very sensitive to substitute prices. However, the variable costs of goods sold in the pulp machinery industry are high, which means that the risk for price dumping is limited. There are different substitutes to the Deltaformer™ upgrade depending on the customer needs; demand for higher capacity can be met by a totally new press or an old restored press with higher capacity. This option may on the other hand lead to huge additional costs for dismantling, overhaul and freights. However there are no MC feed second-hand presses available at the market in this moment. The DPB presses that would be of interest are relatively young in this context, so pulp producers are not yet considering to phase out these machines. (Nordström 2007).

Problems with plugging can be solved by the Niagara™ inlet box upgrade that also facilitates cleaning of the box. The consequence of pulp consistencies above recommended levels are that the internal friction causes plugged inlet boxes, which will have a negative impact on the washing effect. The Niagara headbox provides a better balance between dynamic and static energy and significantly reduces the risk for plugging. A pilot test has shown that washing efficiency can be improved by more than 10%. This solution is although only applicable on DPA1255, 1555 and 1572 presses with bolted headboxes.

Figure 31. Original inlet box. (Metso Paper sales material)

Figure 32. The Niagara™ inlet box (Metso paper sales material)
A benchmark concerning the DPA1255 press reveals the costs and value of substitutes. These figures are rough estimates, production conditions varies heavily over time, and additional costs are to be included in a turnkey calculation. The calculations below are presented in the appendix.
Table 5. Payback calculation of substitutes (Nordgaard, Fernström, Nordström 2007)

<table>
<thead>
<tr>
<th>Type of substitute</th>
<th>Deltaformer LC</th>
<th>Deltaformer MC</th>
<th>Niagara inlet box</th>
<th>Second-hand DPB1255</th>
<th>New TRPB1540</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost</td>
<td>4.000.000</td>
<td>7.000.000</td>
<td>800.000</td>
<td>14-19.000.000</td>
<td>21-28.000.000</td>
</tr>
<tr>
<td>Annual cashflow</td>
<td>67.233.600</td>
<td>67.233.600</td>
<td>1.852.200</td>
<td>67.233.600</td>
<td>67.233.600</td>
</tr>
<tr>
<td>Payback time (days)</td>
<td>21</td>
<td>37</td>
<td>152</td>
<td>73-99 avg = 86</td>
<td>110-146 avg = 128</td>
</tr>
</tbody>
</table>

The scope of supply included above is only main machinery and basic engineering, which means that there will be additional costs from erection and start-up. In the medium consistency upgrades, piping and civil engineering will also be necessary. Variations in prices depend on different steel qualities.

Figure 33. Payback period of substitutes.

What has to be noted is that the low consistency upgrade assumes a potential to raise capacity, while the Niagara™ upgrade is not. If the Deltaformer™ LC upgrade would maintain the original production conditions, the payback period would be a lot higher than the Niagara™ and the other Cases would be totally irrelevant.

10.5.3.2.5 Intensity of rivalry

The rivalry in this business must be considered, not only between suppliers providing upgrades to Twinrolls, but even suppliers that can provide efficient washpress solutions to customer demands, in this case increased capacity and more cost efficient production.
Due to Metso’s acquisition of Aker Kvaerner ASA there are now three major players in the supply of pulp washing systems; Metso Oy, Andritz AG and GL&V. In the acquisition, Metso had to divest some of its technologies to GL&V in order to avoid breaking competitive regulations.

![Net sales MEUR (Metso Paper)](image)

**Figure 34. Net sales MEUR (Metso Paper)**

Metso has a market share of approximately 40% of pulp washing machines. The top 3 competitors accumulated share takes close to 100% of the market. This implies that the competition is low, but important to mention is that there are very few new washing machines sold nowadays, so the market is limited and actions from a new entrant could quickly change the scenario. The main competitor when it comes to new installations is Andritz AG and concerning rebuilds and upgrades GL&V. The graph in Figure 35 includes the overall sales of Metso Paper. Voith Paper is a paper machine supplier, which is irrelevant when speaking of pulp washing.

**Andritz AG**
Andritz has achieved global presence and complete solutions through many acquisitions. They are now extending manufacturing capacity in China and South America. Similar to Metso, the focus is on service businesses. They are also investing heavily in R&D for development of low investment cost systems and sustainability. Another common area, that is important for future businesses are functional service agreements. As Andritz have already been servicing Metso machinery, they show no retreat in the market battle. (www.andritz.com)

**GL&V**
This Canadian supplier has focus on water treatment and other environmental technologies, which they consider the highest growth sector. The P&P market is more mature but they can still see opportunities in emerging markets. Their strategy is to expand the portfolio to deliver complete solutions and to build on service business (MP Business intelligence). GL&V are already supplying replacement rolls and roll-rebuilds for Twinroll™ presses.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Figures 2006</strong></td>
<td><strong>Metso Paper</strong></td>
<td><strong>Andritz Pulp &amp; paper</strong></td>
<td><strong>GL&amp;V Pulp &amp; paper</strong></td>
</tr>
<tr>
<td>Sales</td>
<td>1.947MEUR</td>
<td>1.304MEUR</td>
<td>149MEUR*</td>
</tr>
<tr>
<td>EBITDA margin %</td>
<td>5.7</td>
<td>6.9</td>
<td>8</td>
</tr>
<tr>
<td>Employees</td>
<td>10.867</td>
<td>3.863</td>
<td>1.500 (group)</td>
</tr>
</tbody>
</table>

*EUR/USD = 1,472

Similarities Metso vs. Andritz vs. GL&V
• Targeting emerging markets
• Wholesale strategies (GL&V to expand)
• Focus on rebuilds and service
• Focus on sustainability

To summarise this benchmark, one could say that these competitors are potential threats in the business area of Twinroll™ upgrades and improvement products, but there are yet no signs of a substitute product, despite the existence of the Niagara™ inlet box since a few years. The competition is hard as they all go for “build strategies” in the same area. None of the largest companies can be considered dominant (50 % larger than the other).

10.6 Development of strategies

10.6.1 Specification of the task
The SWOT analysis aims to outline Metsos strategic position on the market and possible directions towards success. All factors will be weighted on a scale from 0 to 5 of importance in this context and motivated.

Strengths
• Technical know-how; customer satisfactions surveys shows that their opinion is that Metso has a very good technical knowledge. This is important because decision makers must have trust in the sales arguments and benefits of the product (Metso intranet).
• Wholesales; in addition to the product, Metso can provide other products and services, for example maintenance and repair for the whole line. This can generate additional sales through the upgrade or create sales opportunities when interfering with customers concerning other products.
• Standardised product; the product consist of modules which means there is no customisation needed between customers. As the target machine differs in sizes this would devastate the scale economies if the product had to be customised.
• Financial strength; Financial liquidity ensures the customers that there will be no difficulties with deliveries, which is occurring in businesses of this scale (Metso annual report 2006).
• Existing relationships; All potential customers are existing customers which means Metso have knowledge about them. Risk and strategy analyses are very general, but experience in contrary provides important information on how to act with certain customers.
• Global presence; Metso can reach all potential customers with existing resources. This ensures the best allocation of resources and maximisation of the opportunity.
• Low competition; there are no close substitutes. (see Competitive risk)

Weaknesses
• Hard to measure; It is difficult to make precise quantification’s of the benefits with the product. For example the savings in chlorine consumption depends totally on the configuration of the process line. Profits from raised capacity depend on demand and other bottlenecks and restraints in production. (Nordgaard 2007)
• High cost of sales; sales actions especially to remote customers are very expensive, because there are lot of resources put into personal sales meetings and other marketing activities.
• Lack of knowledge; The local salespeople have limited technical knowledge, and as a result, sales of rebuild products have been low in foreign markets such as South America and Asia. (CPU SC Annual review 2007)
• Documentation; According to a recent customer satisfaction survey, customers are less satisfied with the documentation of the work performed than the overall satisfaction.

Opportunities
• Growth; Future growth in emerging markets will demand higher capacity in existing machines (Jaakko Pöyrö 2007).
• Environmental regulations; Emission allowances for example, provides a business opportunity when customers need to meet new standards.
• European imports; demand in Europe is much higher than domestic production. Companies need to make production more efficient (Jaakko Pöyrö 2007).
Bundle product; to boost sales, service agreements could be added to the product.

**Threats**
- Business cycles: Most industries have had a steady growth for several years, but the world's economies are now stagnating (www.konj.se).
- Poor profitability: West countries have expensive production causing low profits and less capital for reinvestments (PWC 2007).
- New technology: Substitution technology could erase customer value.
- Raised costs: High metal and energy prices might decrease profitability, both for Metso and customers. As material costs constitute about 50% of COGS (Nordgaard 2007), these are important for the sales potential. Raised steel prices for example might raise sales prices and extend payback times on customer’s investments.
- Mergers and Acquisitions: M&As between customers can increase buyer power and rivalry between suppliers.

10.6.2 Appraisal of issues

In line with the theory of Dynamic SWOT analysis, each issue will be given a quantitative evaluation that implies their significance in operations. The measure ranges from 0 to 5:

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-tech image</td>
<td>Hard to measure</td>
<td>Growth</td>
<td>Business cycle</td>
</tr>
<tr>
<td>Wholesales</td>
<td>High cost of sales</td>
<td>Environment</td>
<td>Poor profits</td>
</tr>
<tr>
<td>Standardised</td>
<td>Lack of knowledge</td>
<td>European efficiency</td>
<td>New technology</td>
</tr>
<tr>
<td>Financial strength</td>
<td>Documentation</td>
<td>Bundle product</td>
<td>Raised costs</td>
</tr>
<tr>
<td>Relationships</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global presence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low competition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tot</td>
<td>24</td>
<td>16</td>
<td>11</td>
</tr>
</tbody>
</table>

When selling a high technology product, it is very important to have a reputation of technical knowledge to be trustworthy, so this is given high credits. The sales occasion will probably not include other equipment. This makes the strength of wholesales less relevant in this appraisal. Financial strength and global presence are almost requirements for this type of businesses and standardised product helps to keep costs low. Low competition and the knowledge from existing relationships will contribute to a good market share.

In business-to-business selling, it is important that the buyer can be shown a clear value of the product and this is not evident in this case. The high cost of sales diminishes the profitability of the products. Knowledge of the product is a requirement to be able to sell it.

Growth of demand for paper products will ensure sales even during depressive periods. Environmental regulations provide an opportunity for improvements, especially when this is restraining production volumes. The negative balance of trade with pulp in Europe creates an opportunity of making these mills more efficient and thereby gains a share from imports, which is a good sales argument. Bundling the product with maintenance for example will limit the installation costs, as there will be no additional losses of production.

Economic recession will lower production levels under the upper limits and extinguish the demand for capacity. Poor profits in western world will limit the capital for investments. New technology that provides a better offer could possibly steal the whole market. Raised costs can reduce customer’s profitability, raise the product sales price and thereby extend payback times.
10.6.3 Plotting the Centre of Value

The points of balance between issues are:

\[ \text{Opportunities} - \text{Threats} = 11 - 15 = -4 \]  
\[ \text{Strengths} - \text{Weaknesses} = 24 - 16 = 8 \]

(27)  
(28)

The centre of value in the SWOT matrix will thereby be (8, -4). The following matrix visualises the centre of value and the strategic vector:

![SWOT Matrix Diagram]

Figure 35. SWOT matrix.

By plotting issues in a “issue profile matrix”, they can be separated by different timeframes. The issues can also be sorted by their characteristics; those who are in the company’s control and those in the business environment.

Table 8. Issue profile matrix – Company Control Issues

<table>
<thead>
<tr>
<th>Company Control Issues</th>
<th>Timeframes</th>
<th>( \text{Short} )</th>
<th>( \text{Medium} )</th>
<th>( \text{Long} )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
<td></td>
<td>Technical know-how</td>
<td>Wholesales</td>
<td>Standardised</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td>Hard to measure</td>
<td>to measure</td>
<td>High cost of sales</td>
<td>Documentation</td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td></td>
<td>Bundle products</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Threats</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9. Issue profile matrix – Business Environment Issues

<table>
<thead>
<tr>
<th>Business Environment Issues</th>
<th>Timeframes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short</td>
</tr>
<tr>
<td><strong>Strengths</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>Business cycles</td>
</tr>
<tr>
<td></td>
<td>Poor profits</td>
</tr>
<tr>
<td></td>
<td>Raised costs</td>
</tr>
<tr>
<td><strong>Threats</strong></td>
<td>Business cycles</td>
</tr>
</tbody>
</table>

10.6.4 Strategy formulation

The strategy for reaching the desired corner in the SWOT matrix is to:
- Build on strengths
- Eliminate weaknesses
- Exploit opportunities
- Mitigate threats

Most issues controlled by the company are concerning long-term strategies and characteristics apparent through all timeframes. What could be controlled in the near future though, is the problem of measuring product performance. This could be eliminated by a pilot installation. Selling one upgrade at a discounted price in exchange for the possibility of measuring performance would provide benefits for both parties. Metso has in previous analyses emphasised the importance of references as a sales tool.

The issues that cannot be controlled could however be avoided. Both the threat from new technology, substitutes and economic recession can be minimized by timing of the sales efforts. The strategy here is to gain as much sales as possible in the first years to reduce the impact from new entrants, the threat of technological change and substitute products. This could be done by first targeting large customers with good motifs for investments and good financial conditions. Those customers highly affected by business cycles will be targeted in periods of high demand and good profits.

10.6.5 Design and management of processes

Key event schedule in short-term (1-2 years)
1. Define product manager and responsibilities
2. Perform pilot installation and tests
3. Develop marketing and internal training material to product vault
4. Educate salespeople
5. Cooperate with Operation audit PM to audit target customers
6. Arrange seminars for target customers, participate in exhibitions
7. Follow-up with personal meetings?
11 Sales forecast

The sales forecast is an attempt to predict how many upgrades that will be sold during the expected life cycle. The result could then tell if it is possible to achieve a good return on investment.

These assumptions are based on my own estimations and discussions with MP employees.

Sales assumptions:
- The product life cycle is 10 years
- The lead-time is for an operation audit is 1 month and for Deltaformer™ approximately 6-8 months.
- Quotations will be invoiced the following year
- We will be able to sell an average 4 upgrades per year
- During the introduction period, MP will sell 2 upgrades per year
- Competitive products could possibly occur after 5 years
- Economic recession could be apparent in 2 years

The life cycles of Metso paper products are usually characterised by long introduction periods.

Figure 36. oxygen delignification sold capacity. (Metso intranet)

The forecast below is based on moderate assumptions. The forecast excludes surrounding equipment and additional offerings, so the final profit per upgrade could be higher. Moreover many customers will demand upgrades for more than one Twinroll™, which means sales volume will probably fluctuate more than shown in this case. On the other hand, sales are assumed to remain unaffected by competitors etc in this forecast.

The sales price is assumed to be 4 MSEK per upgrade sold, and a profit margin of 10%.

table 10. Sales forecast.

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customers</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>Qty</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td>Sales</td>
<td>0</td>
<td>80000000</td>
<td>80000000</td>
<td>80000000</td>
<td>120000000</td>
<td>120000000</td>
<td>160000000</td>
<td>160000000</td>
<td>200000000</td>
<td>240000000</td>
<td>1240000000</td>
</tr>
<tr>
<td>Profit</td>
<td>0</td>
<td>80000000</td>
<td>80000000</td>
<td>80000000</td>
<td>120000000</td>
<td>120000000</td>
<td>160000000</td>
<td>160000000</td>
<td>200000000</td>
<td>240000000</td>
<td>1240000000</td>
</tr>
<tr>
<td>Accumulated</td>
<td>0</td>
<td>80000000</td>
<td>160000000</td>
<td>240000000</td>
<td>360000000</td>
<td>480000000</td>
<td>640000000</td>
<td>800000000</td>
<td>1000000000</td>
<td>1240000000</td>
<td>1240000000</td>
</tr>
<tr>
<td>Market share</td>
<td>0.00%</td>
<td>0.62%</td>
<td>1.64%</td>
<td>2.46%</td>
<td>3.69%</td>
<td>4.92%</td>
<td>6.55%</td>
<td>8.33%</td>
<td>10.25%</td>
<td>12.20%</td>
<td></td>
</tr>
</tbody>
</table>
The forecast shows that the expected sales are actually only a small share of the total market during this period. This share however, would generate a sufficient return on investment (see 10.3.3.2 Value to the organisation). Accordingly, Metso has a wide base of customers to sort out those with the best sales potential.

12 Marketing mix

The marketing plan specifies what promotional actions that have to be taken in order to reach the sales objectives.

The aim with this marketing plan is to reach the forecasted sales of four sold upgrades per year during a ten year period. The marketing strategy for the Deltaformer™ product must go in line with the corporate strategy of MP.

12.1 Promotion

The information below is based on an interview with Stig-Arne Söderholm, Sales Manager, Chemical Pulping Metso Paper 2007.

Promotional activities are mainly performed by sales engineers. The product portfolio of the sales engineers for chemical pulp is spareparts, repairs and upgrades. The sales actions are most often based on earlier inspections on the equipment made by MP. The interviewee in this study, feels that he can highly affect the sales volume of all his products. However, salaries are not based on commission, but employees receive a bonus based on the overall performance of MP. As sellers spend much time traveling, and they are allowed to plan their office hours independently.

The size of the Deltaformer™ investment is rather small in the context of industrial selling and therefore, it is likely that emotions can influence buyer decisions. In addition the buying center of the purchasing organisation often includes production managers, maintenance engineers and purchasing managers. This means that buying decisions are made at the plant level, not from the board of directors. Good relationships to these people are thereby very important, and in personal selling, the key to this is internal marketing. As salespeople tend to stay shorter in their positions than buyers, employee retention creates stronger relationships (Jobber et al 2006). The key to retain successful sellers is to keep them motivated and satisfied. A commission based on sales performance would both keep sellers motivated and give an incentive to sell upgrade products.

New products are promoted by sales seminars for customers in a specific region. These are often combined with relationship building activities. There are also frequently other gatherings between sellers and purchasers, for example watching Ice-hockey games. Employee turnover of the Scandinavian MP salesforce is almost non-existing. This is also beneficial for customer relationships.
MP salespeople attend several education programmes, including salesmanship, leadership and business law. When a new product is released for sales though, information have to be gather on their own initiative. One issue that came up during an interview was that the technical support between global salespeople and Product managers in Sundsvall is not very good. Sellers in distant locations are simply provided with information brochures. In personal selling, it is essential to relate product features to customer benefits. Following this, it is very important for salespeople to have a genuine knowledge about the product (Jobber et al 2006). This knowledge will also strengthen the confidence of the seller. A training programme for sellers in the target markets would be sufficient to provide this knowledge.

Other marketing actions already practised by Metso Paper is presentations at trade shows and exhibitions. A recent study by Tuncalp (1999) concludes that this is one of the most important sources of information for making industrial purchases.

To minimise the introduction period and generate quick sales, a clear marketing strategy is needed. This is a checklist of what should be done:

- Develop an education programme for salespeople
- Strengthen sellers incentives by payment on commission
- Other benefits to retain good sellers
- Record references and performance of installed upgrades and develop presentations
- Publish articles in customer magazines and other p&p magazines
- Participate in trade shows, exhibitions and conferences concerning the p&p industry
- Arrange seminars for potential customers

### 12.2 Price

*This section discusses how the product should be priced, and also alternative payment strategies.*

My opinion is that Metso Paper’s overall price strategy is premium pricing. The base for this strategy is to deliver “global-leading technology and expert service for life-cycle long efficiency of customer processes” (www.metsopaper.com). This a suitable strategy for this product as well. However, there are additional approaches to pricing that should be considered within the premium strategy.

The strategies reviewed in the theory section (see chapter 7.2.10.2) will be commented below:

**Loss-leader;** This strategy is not needed in this case, even though it is important to have customer references. My assumptions are that there will be Deltaformers™ installed in the near future, as there are already ongoing negotiations with customers concerning upgrades.

**Promotional pricing;** This is an interesting strategy for MP. In their product range, Metso Paper can offer process audits, that result in recommendations for improvements of the customer’s process. These “Operations audits” could be a tool to find the most attractive customers and also to promote the Deltaformer™ upgrade.

**Bundle products;** One possibility for MP is to offer a customised package to upgrade the whole washing process for handling medium consistency pulp. For example this could include Deltaformer™, pumps and a standpipe to be mounted in the blowtank. This would increase the overall sales price.

**Price discrimination:** This strategy is suitable for MP as customers differ in price sensitivity. For example customers that have high margins and will have a short payback time can be charged higher prices. As a rule of thumb, MP could set a guaranteed payback time of one year. The problem here is how to make precise measurements of earnings from the upgrade.

**Commission pricing;** to invoice a share of revenues generated by the upgrade would act as a warranty for the customer, but also a threat of being overcharged. In addition, customers would probably demand fines for underperforming products. The problem with this concept is also the difficulties to measure enhanced performance, as this varies over time and it is difficult to prove which improvement that comes from this upgrade.
**Optional extras:** To further maximise sales, optional extras can be offered. An example of this could be an agreement of Metso paper following up the result of the upgrade.

The Product investigated in this study will be customised for each customer. Thereby it is not possible to set a general price. Furthermore prices in industrial selling are highly negotiable. The price should also be proportional to the customer value created. This raises the question of how to adjust the price for the individual customer.

The suggested price strategy concerning the Deltaformer upgrade is the following:

1. Offer process audits to the suggested target customers for a fairly low price, and analyse the needs for each customer.
2. Quote a customised package including surrounding equipment, delivered as an improvement of the whole brown stock washing stage.
3. Set the price proportional to the estimated customer value that could be justified through calculations by process-engineers. The payback period should be less than one year.
4. If there is a clear monetary value derived from the upgrade, payment could be determined as a share of the value generated. For example, one key indicator could be agreed and MP will receive bonus payment based the performance of this indicator. Ex. COD per tonne in bleach plant.

### 12.3 Product

The core product offered in this case are the tangible items and the service that is delivered to each customer. Specifications of these are as follows;

- 1 set Deltaformer™
- General piping
- Control valves
- Flow meters
- Basic engineering instrument

The augmented product includes the following features;

- Detailed engineering
- Erection supervision
- Commissioning and start-up assistance
- Training
- Civil engineering
- EPC / Turnkey scope

#### 12.3.1 Warranties

In case there are no specific warranties agreed, MP will refer to the “Orgalime S 2000 general conditions for the supply of mechanical, electrical and electronic products”. Orgalime is a European federation representing the interest of the EU institutions of engineering industries. The conditions stated in this agreement is intended for use in international contracts, concerning delivery of engineering industry products in general. The context of this agreement is for example risk responsibilities, specification of delivery time, liability for defects and payment conditions.

When MP supplies full production lines however, it is most often stated guarantees in the contract. These can involve production parameters such as capacity levels, pulp consistency levels and washing efficiency levels (in the case of washing equipment). It is also clearly defined how and when these factors will be tested.
12.4 Place

12.4.1 Distribution channels
Metso Paper’s distribution channel is direct selling without intermediaries. This strategy is a matter of course, as the high technology products demand expertise knowledge to explain its applications. Products are manufactured at the production sites and shipped on the means of transport nominated by the buyer.

12.4.2 Transportation
Metso Paper follows the set of trade terms published by the International Chamber of Commerce, named “Incoterms 2000”. In these terms, responsibilities are clearly defined to eliminate the risk of disputes.

The two opposites of terms in this framework are “Ex works (EXW)”, where the goods have been placed at disposal of the buyer at the suppliers site. And “Delivered duty paid (DDP)”, where the goods are delivered at the buyers destination, not unloaded and with duty paid. The most common freight term used by MP is “Free Carrier (FCA)”, where the goods are placed at disposal of the carrier nominated by the buyer and export procedures performed by the seller.

13 Conclusions
In this chapter, findings from the analysis and empirical investigation are gathered to answer the research questions.

13.1 Strategy

RQ1: What strategy is optimal for launching the Deltaformer™ upgrade on the market?

As the P&P market can be considered a conservative industry, it is difficult to introduce new types of products, sold in non-traditional ways. Therefore a pilot installation to achieve specific references is needed. A primary focus to sell for capacity expansion is likely to result in larger order sizes, and also provides more value to the customer.

13.1.1 Target customers
Considering the product benefits, use of resources and to best fulfil customers needs, the sufficient strategy to find the most attractive customers is to:

1. Locate European companies restructuring or focusing on environmental issues. Large-scale lines are most likely to demand expansion due to restructuring and would also save more costs on chlorine reduction. If environmental motifs, focus on post-oxygen presses with sales arguments of reduced chlorine consumption and following cost savings.

2. Audit large lines in the emerging markets. These customers will require less improvement to achieve reasonable payback times. The main target should be plants where capacity is restrained by bottlenecks in either Twinroll™ presses or chemical recovery plants.

However, the product has a potential of being valuable for all customers included in this study. As a second priority, customers can be targeted out of the most convenient sales perspective.
13.1.2 Marketing activities

Education of salespeople
In direct selling, it is fundamental to have a good knowledge of the product. To secure the personal selling skills of the salesforce concerning this product, an education programme could be developed. The aim for this education is to train the seller on how to identify the best solution for the customer, and how to present the benefits in order to succeed. Another issue is to inform about pricing strategies.

When selling a product that requires a smaller investment for the customer (in this case smaller than single machines and complete plants) it is important with customer relationships, as these can affect the choice of supplier. To strengthen the buyer-seller relationship, a plan for CRM activities could be developed.

13.2 Product value

RQ2: How can this product contribute to the product portfolio in terms of customer value, sales and profit?

13.2.1 Customers perspective

The main customer incentive for upgrading is capacity expansion that will give an incredible payback. This presumes that there is a bottleneck in the washing stage. Improved washing efficiency however, could also provide a good payback, and also benefits from environmental sustainability perspective. There might be customers focusing on environmental issues, or plants restricted by emission allowances.

13.2.2 Metso Paper perspective

Deltaformer™ could indeed contribute to the product portfolio, when considering customer value. It is impossible to come up with a general economic value to the customer, as it all depends on the specific case. However, the product can generate good economic value in the case of capacity expansion. To state an example, a capacity expansion of 6-12adt/d would result in a payback time of 1 year depending on manufacturing cost, production conditions and based on my estimated values. We can also expect a significant reduction of chlorine consumption if installed in the post-oxygen stage on an appropriate machine. For example, at a production level of 1400adt/d, it would be necessary to decrease chlorine consumption with 4,32kgs/tonne to achieve a payback time of 1 year according to the mathematical formula used in the analysis. Even though this economic requirements are harder to achieve without capacity expansion, it might be more important from a social responsibility perspective and also to achieve environmental goals. Reduced chemical consumption is also interesting from a capacity perspective, as the chemical recovery plant might be a bottleneck restraining further expansion.

The preliminary sales forecast, based on average 4 upgrades sold per year, would result in about 124MSEK sales on a 10 year basis. Considering the estimated costs for launching this project of 700,000 SEK, this will result in a ROI of 1771%.
14 Discussion

The discussion aims to discuss and criticize the results and conclusions portrayed in the previous sections.

The theoretic model, applied to the area of business planning provides a sufficient framework for answering the research questions. Compared to MPs template for business planning, this theory adds several important aspects such as time and risk.

Quantitative measurements of product-value, sales, costs and setting of prices are in this report restrained by a complex process and various kinds of customers. My believes are that this model applied on a standardised product on a homogenous market would result in more precise figures.

The segmentation of customers have resulted in the identification of segments with separate preferences. However, this model is not able to spot single target customers.

15 Validity and reliability

In this chapter, the validity and reliability of the findings and conclusions are discussed.

One of my biggest concerns in this study was the validity and reliability of data. The fact that no pilot installations have been made makes the product benefits unclear. Estimations differed between sources, but finally I decided to use data from the engineer responsible for the construction of this product rather than a process engineer. The assumptions in this study are based on estimations by an experienced Metso design engineer, which has performed lab tests on pulp washing theories. However it can not be assured that an application in a customer plant would give as good results as shown in this study.

The target product, the washpress, is also affected by the surrounding production line, that in itself differ from case to case depending on different production methods for different pulp properties. This means that it is impossible to draw general conclusions. In the scope of this study it would be impossible to capture the full complexity of a pulp production plant, also because production conditions, raw materials, labour competence, and several more factors are unknown. Even replicated measurement would differ from time to time, so the data used in examples are calculated averages.

Inconsistency between sources of information, and limited access to data with both geographical and cultural distances has been a problem. For instance, financial figures are unavailable from Chinese companies not listed on the stock exchange. The limited resources make it impossible to collect primary data from hundreds of customer all around the world, so this is collected through Metso Paper sales personnel.

16 Further research

16.1 Extended scope of this study

As the collection of data concerning customer specific conditions requires a lot of resources, I had to limit the study to a case where a process audit already had been made. The conclusions from this case study, in combination with the global market analysis, provide implications of the product value for other customers too. However, to get an extended view of the product value, it would be interesting to perform the same analysis on other cases with totally different conditions.

The variables analysed in this study are those we consider measurable with the resources available. These are measured in terms of monetary value, but there are also other dimensions of product benefits. Extensions to this study could be to also include customer benefits that are more complex to analyse, such as availability, increased operating window and quality improvements.

Some of the components in this business plan are based on the sales forecast. This forecast is developed by intuition, supported by experience from earlier products and the resources available.
To make the business planning process easier, a framework for forecasting could be developed. The set of variables suggested in this study could be further developed into a quantitative forecasting model.

### 16.2 Additional research within the theory

To verify the model used in this thesis, it would be interesting to test it on other types of business opportunities. For example, this could involve consumer products, where customer value and market potential is defined differently. Service products could also test this model in a different way, or another organisation, that is in another stage of the organisation life cycle.

Another interesting approach to the model would be to employ multiple participants in the development of strategies process, as brainstorming tends to be more creative than individual decisions. When estimating values, it would also be interesting to involve a group as several opinions could create more rational evaluations.

### 16.3 Continued planning for the Deltaformer™ launch

This report provides a base for locating attractive customers by specifying which markets, machines and customer characteristics that should be targeted. Specific sales planning is not included. To progress with this, the customer’s future strategies have to be mapped.

Furthermore, marketing material has to be prepared for example promotional brochures and sales presentations. A plan and time schedule for participation in trade shows and exhibitions should be established.

In addition to this, the strategic issues suggested in this report should be implemented. This involves strengthening seller’s incentives, development of education programme and customer relationship management.
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17.4 Other

Metso Paper intranet

Metso Paper Business intelligence
# Appendix

## 18.1 Customer segmentation levels

1=high level, 0=low level

### Table 11. Level of segmentation variables (www.jpsmartterminal.com)

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<th>Growth forecast</th>
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18.2 Payback calculation of substitutes

Niagara inlet box:

Payback time = \( \frac{\text{Initial investment cost}}{\text{Annual cashflow generated}} \) = \( \frac{800,000}{1,852,200} \) = 0.43 years = 152 days

Second-hand DPB1255:

Payback time = \( \frac{\text{Initial investment cost}}{\text{Annual cashflow generated}} \) = \( \frac{16,500,000}{67,233,600} \) = 0.25 years = 86 days

New TRPB1540:

Payback time = \( \frac{\text{Initial investment cost}}{\text{Annual cashflow generated}} \) = \( \frac{24,500,000}{67,233,600} \) = 0.36 years = 128 days