

## PREFERENCE CASE SELECTIONS

### CASE III – INVESTMENT DECISION ANALYSIS

In investment decision-making in organisations, large values can be at stake. The need for a structured process is evident, not least when several people or interests are involved in the process. We advocate that the use of modern computational decision analysis can improve such investment processes by improving visibility and only requiring reasonably precise input data. The applicability of a structured decision analysis to corporate decision-making is demonstrated in a case study at a major forest company in Sweden. The decision problem consists of whether a new system for logistic control should be implemented or not. The background information was collected through interviews and the structuring and analysis of the problem was performed using the tool *DecideIT*, designed for handling situations where uncertainties in input data prevail. The result of the analysis points out a reasonable action, but also shows which aspects are crucial to consider for a reliable result.

### INVESTMENT DECISION ANALYSIS

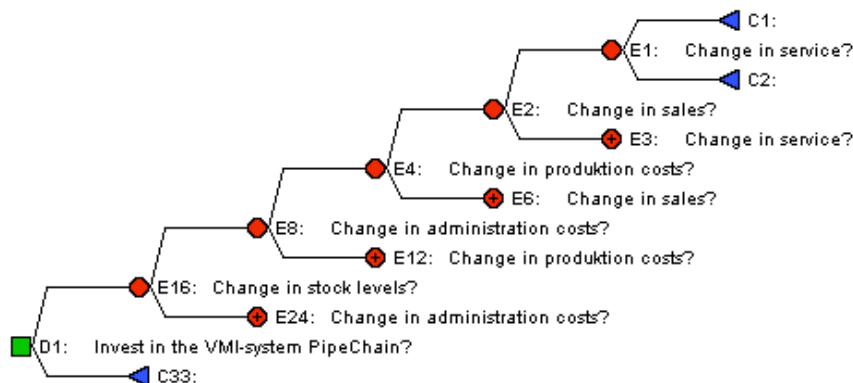
Among the most difficult and important corporate decisions are those involving forecasts where little background data is available. Because of the importance of such decisions, elaborate analytical work might be beneficial, could an appropriate form for it be found. The purpose of this article is to demonstrate that rational decision making have a role to play also when analysing such problems. Standard tools using classical decision analysis are not entirely appropriate for such analyses because of the strong requirement of precise data in the evaluation phase.

### EXAMPLE

Consider a transport and logistics company co-ordinating large goods flows within its mother company, handling marine transports and managing a reloading facility. The company is also functioning as a logistics advisor and has recently been analysing the need for a VMI system (Vendor Managed Inventory), where the tool PipeChain has been their foremost alternative. However, a decision analytic approach to the investment in such a system is desired and the work is carried out in the following steps:

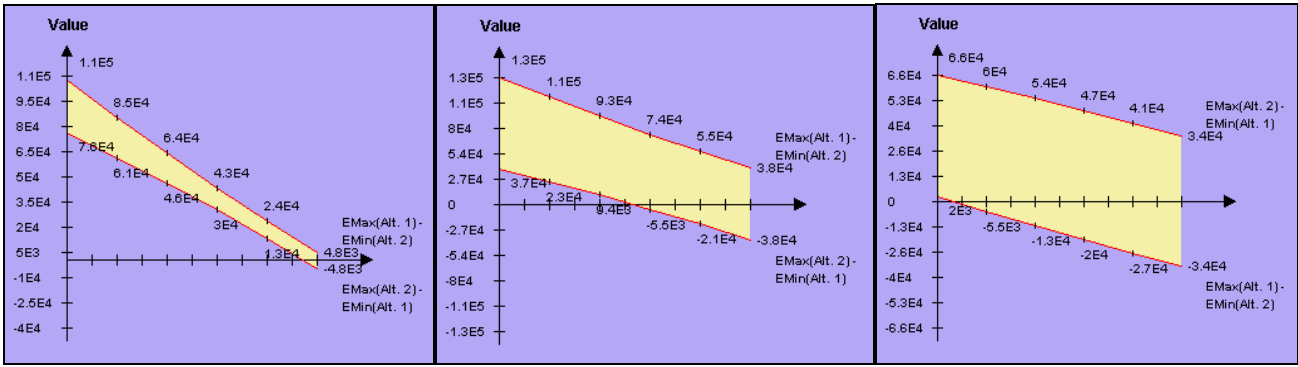
- A mapping of the current product and information flow is carried out
- Identify the possible consequences for the affected factors, e.g., stock levels, administration cost, production, service, sales and spin-off effects.
- Consider the price and depreciation rate concerning the new system

The problem can be represented in *DecideIT* as the decision tree below



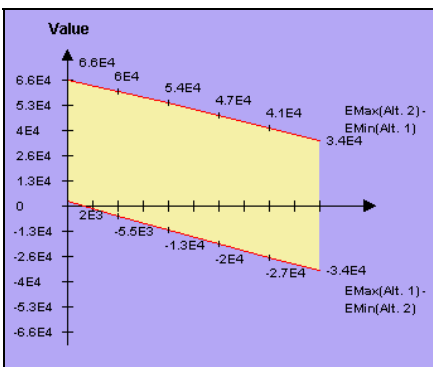
**Figure: Decision tree model of the problem**

In the figure below, an evaluation of the investment is shown as pairwise comparisons between the option of investing in a new system or stay with the current.



**Figure: Example of evaluation of planning options, studying effects of three, five, and ten years depreciation rate respectively.**

If the underlying production should not be as reliable as assumed, the introduction of a new system would not be able to reduce the stock levels. This situation is shown in the figure below, with a depreciation rate of five years.



**Figure: Result with 5 years depreciation rate and with unaltered stock levels**

The conclusion from the gathered information is that the expected monetary values are positive, although the result is rather sensitive to a shorter depreciation rate than 10 years as well as to the reliability of the production line. Based on the analysis, the decision was to initiate a procurement process with the goal of purchasing PipeChain. The result of the analysis points out a reasonable action, but also what aspects are crucial to consider for a reliable result. One key experience from using the decision analytic approach to investment decision-making is that the visibility of the alternatives increased. The input data needed not be precise and thus, it was much easier to obtain initial input values to the decision process from various sources.

**Please contact Preference for further details.**