Soft-investments appraisal

Cost-benefit analysis of the implementation of work groups as an example

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Abstract *Aims to show that, by using a simple step-by-step approach to cost-benefit analysis, we can deal with "soft" items (such as the restructuring of organizations) so that they are integrated within the overall business policy. The conceptual exercise is illustrated on the basis of a case study on the implementation of socio-technical work groups in a Dutch factory. First, socio-technical work groups are defined as an example of a "soft" investment. Next, the step-by-step approach is described, showing that qualitative considerations can be reworked into financial figures such as those used in traditional investment analysis. Subsequently, this approach is applied to the illustrative case study. In the randomly selected case study it appeared that the decision to implement socio-technical work groups could be dealt with as an investment. Using traditional techniques, the investment was analysed as risky but profitable. In the casuistic step-by-step approach, management, with or without the help of a consultant, reworks qualitative considerations into financial figures. The transparency of this approach enables them to prove the reliability of the process as well as the validity of the conclusions drawn from the calculations based on their situation. Management's discussion of the qualitative considerations and financial figures provides a description of the future situation that is as complete and clear as possible.*

Introduction

Rational decision making is seen as a key characteristic of successful management. However, in practice we find a peculiar difference in the way decisions are taken. So-called "hard" decisions seem to involve rationality being practised, whereas "soft" issues seem to get a far more "political" approach. The purchase of a new piece of equipment or the entry into a new market is prepared carefully: a problem statement is formulated and alternatives are developed and evaluated in financial terms (Brealy and Myers, 1996). Only if the calculations show that the risk and the profitability are adequate is the decision approved. "Soft" decisions are based more often on how high the item is on the agenda: is it fashionable, good for the corporate image? Is it popular with the executive responsible? Are there any legal obligations, etc.? (French and Bell, 1984). One major consequence of this difference is that "soft" issues, such as new type of job design, environmental care etc., can never be truly integrated with the overall business policy if they are treated as second rate. Successful management implies rational decision making and, consequently, evaluation

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along those same lines. Excuses such as "it is too difficult", and "the advantages are obvious", should no longer be accepted.

As all decisions are taken and implemented in the present in order to bring about results in costs and benefits in the future, we can regard them as investments. As such, we can rate every decision in terms of riskiness and profitability, using traditional investment selection techniques such as payback time and net present value. To do so, we need to know about variables such as the amount to be invested, the cash flow pattern, project duration and discount rate. This is difficult as we can only predict these figures. The major difference between "hard" and "soft" decisions seems to be that for the first category we seem to make "objective estimates" whereas for the latter we only give "subjective opinions".

This article provides a simple step-by-step approach to enable management to make generally accepted estimates based on individual, subjective opinions. This approach should be applicable in every given situation and should provide the material necessary to take a rational decision based on an uncertain future. Whether this can be done depends on the judgement of the managers involved with respect to the reliability of the process as well as the validity of its result. These managers have to make a decision that suits their situation and prospects, making it in a casuistic and subjective way. However, the question here is whether they can reach agreement with respect to the variables associated with investment selection techniques.

The socio-economic situation in the world has changed dramatically over the last few decades. This has forced not only countries but also firms especially to improve their performance (cf. Piore and Sabel, 1984; Womack *et al.*, 1990). Although "hard" investments, like computer-aided technology, are mentioned now and again, the emphasis is on "soft" investments. One way to improve competitiveness according to most publications in this field is to abandon Taylorism and to embrace group work. This may sound strange, as group work is already an old phenomenon which social scientists have always claimed would yield high economic results. Blumberg (1968), Bijsterveld and Huijgen (1995) among others have summarised the economic results such as: sales, profit, motivated workers, productivity, higher quality and less waste. Nevertheless, Benders *et al.* (1995) claim that the level to which this method of organisation is applied in practice is still disappointing. Herzog (1991) points out that unsatisfactory economic performance is a killer argument if one wants to implement work groups, and this is especially true in cases regarding "soft", social aspects. In section two we elaborate on these observations and integrate them into a single investment problem: how spending large amounts now will ensure premiums in the future, on a yearly basis.

If we consider the implementation of group work as an example of a "soft" investment, we are still left with the problem of how to calculate all the relevant variables needed to make a selection from the available alternatives. In section three we justify our choice to use a cost-benefit analysis and describe how this technique can be used within the setting of the firm. Two important demands

prevail: all alternative investments have to be decided on on the basis of the same criteria (preferably criterion!) and all, but only, the consequences resulting from the investment that are relevant to the firm have to be taken into account. This particular cost-benefit analysis always involves parties with different interests at stake. The "winners" have to compensate the "losers" and still make a profit (Mishan, 1971). The proposed approach to cost-benefit analysis consists of five steps that are presented in this section with special reference to the implementation of work groups.

The application of a cost-benefit analysis to evaluate the implementation of work groups is the subject of the fourth section. This case was selected more or less randomly, as the firm in question had already decided to implement work groups and had made a qualitative analysis prior to that decision. The idea here is that if such an analysis can be made in one firm for one type of "soft" investment, the analysis is analytically generalizable (Yin, 1989).

After a few years of discussions, the case company, Van Doorne's Transmissie (VDT), actually decided to introduce modern socio-technology, the Dutch branch of socio-technology. VDT is an innovative firm which produces parts for cars. It has been growing very fast and its sales are expected to increase even more over the next three years.

Finally, the results from the case study will be summarised and discussed within the frame of reference of the article. The question central in discussion will be whether "soft" decisions can be treated as investments and chosen using traditional investment selection techniques. Special reference will be made to the question of whether the proposed five-step approach to cost-benefit analysis is transparent enough to make the process reliable and its result valid for the management and workers of the firm involved.

Work groups as an example of "soft investments"

It was mentioned above that people from very different backgrounds have advocated the need for work groups. On the one hand, authors such as Womack *et al.* (1990), refer to teamwork in their lean production approach. The content of their teams is not very well articulated. On the other hand, for Piore and Sabel (1984) and those who follow their approach, work organisation is a separate topic with its own merits, not only for "soft" reasons such as improved satisfaction as a result of the better quality of working life, but also for "hard" reasons such as improved flexibility to meet market demands. As such, work groups can be seen as a tool, similar to technology and market development, used to contribute to the achievement of the overall goal of competitiveness. Here, we also see a money-consuming measure implemented to yield benefits in the future to repay the investment with an additional rent. Although the advantages of this measure are known, either in financial, or in quantitative and in qualitative terms, they are not elaborated on in more detail. This leaves two questions:

(1) How can group work be characterised?

(2) How does it bring about the above advantages?

Group work characterised

Work groups have been labelled in many different ways, including socio-technical (Emery, 1959), human-centred (Badham, 1995) or anthropocentric (Rauner and Ruth, 1991), but also as lean production (Krafcik, 1988) or simply teamwork (Toyota, 1992). All these labels have some characteristics in common in that they refer to an overall task the division of labour and a corresponding need for co-ordination. Of these approaches, socio-technology is the most widely known and has been described most explicitly, which is why we will concentrate on this form in the present article.

Originally, socio-technology was seen as a kind of merger between the social and the technical subsystems of a firm, in the sense that one cannot be implemented without the other (Emery and Trist, 1960). According to Scott (1987), the object of the design is to "jointly optimise" both components. In everyday practice, however, the focus is more on the demands of the technical system and human labour is fitted in later. Nowadays, as a result, the technical subsystem is more or less neglected in socio-technology.

In The Netherlands, one particular branch of this approach is fairly popular: modern socio-technology (Bijsterveld and Huijgen, 1995). As the firm in our case study is Dutch, we will concentrate on this form of socio-technology.

Modern socio-technology is a design method, a way of organising; this means that it has to incorporate the division of labour and consequently also co-ordination. This is achieved in four steps (Bijsterveld and Huijgen, 1995). Steps 1 and 2 reduce the required process variation and therefore the need for co-ordination. Step 3 aims to decrease available opportunities for process variation and this again mitigates the need for co-ordination. The final step involves the construction of a co-ordination structure. Figure 1 includes an example of such a structure.

(1) *Parallelization.* The first step entails the production process being divided into several parallel production flows. Instead of grouping activities of the same kind together, orders of the same kind (markets, products) are grouped. The effect of parallelization results in a significant reduction in input complexity. Parallelization compared to a functionally organised production process reduces the input variation per production flow.

(2) *Segmentation,* The next step involves the reduction of internal variation within the production flow by reducing the number of interfaces between performance functions. This reduction results in segments created in such a way that the number of the internal interfaces between functions is maximised and the number of interfaces between segments is minimised. As a result, the production flow is divided into a number of parts, each of which performs a set of mutually dependent activities using a large number of mutual input and output relations.

(3) *Groups.* The "whole" or semi-autonomous task groups are responsible for their part of the segment of a production flow, or the production of a

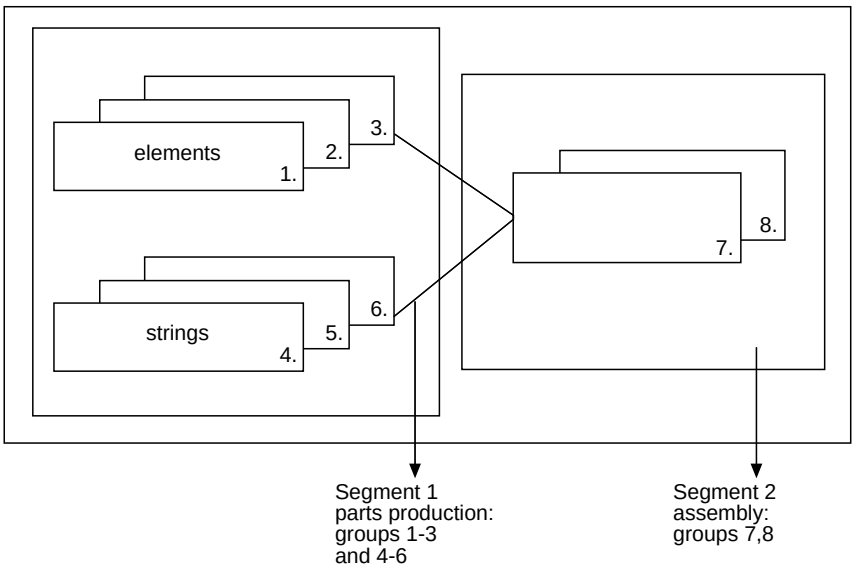

Figure 1.
Socio-technical organisation at VDT

complete (part or component of a) product or service. They can be characterised by strong internal cohesion, multi-skilled tasks, polyvalent workers, internal co-ordination responsibilities and participation in co-ordination in and between segments. This means that groups not only perform all the production activities necessary for their product, but are also responsible for planning activities (e.g. assigning positions to workers), control activities (e.g. quality control) and support activities (e.g. cleaning up the workplace).

(4) *Control structure.* The control structure used to co-ordinate these processes is not very complex. The amount of required control information is decreased through parallelization and segmentation. Both aim at a reduction of the number of interfaces. The information needed to control the groups is available within them. This means that groups can and should control their own performance. In addition they should be able to participate in the control of interfaces with other groups in the segment they belong to. The performance of these groups influences the conditions they face.

Implementation of such an organisational design means that a firm has to put a lot of effort into the reorganisation process before any possible advantages can be "cashed" in on.

The management and workers have to become familiar with the concepts needed to communicate new job design and control. This requires a considerable amount of extra education, training and workshops to raise the awareness of opportunities created by the new form as well as the actual shape it should take on in their firm.

In order to achieve the desired autonomy between segment-groups, buffers are required that create the necessary slack. In addition, there should be an information infrastructure that enables the work groups to communicate horizontally as well as vertically. These two requirements relate to the law of requisite variety. The internal diversity of self-organising systems should match the variation within their relevant environments. System controllability requires a balance between the available internal possibilities for process variation and required process variation. Too many possibilities create an inefficient system, whereas an insufficient number of possibilities results in an ineffective system.

Group work advantages

In the future performance of the firm this type of implementation brings about a number of far-reaching changes. Because control is left, in part, to the work groups, vertical information processing is limited to broad but meaningful categories, leaving details to the realms of internal group communication. Another advantage is that the required flexibility is achieved, which makes it possible to satisfy demanding, but well paying clients. On the other hand, a disadvantage can be expected with regard to multi-skilled workers, both with respect to operations and control because they have to be paid higher wages (Karlsson, 1995).

In this way we are in a position to calculate whether or not a net surplus will result from a decision to implement work groups, as we know what the qualitative arguments are. Hence, we can show how work groups contribute to competitiveness and, consequently, the profitability of the firm. What we still need, however, is an instrument to make these calculations.

Cost-benefit analysis: appraisal of "soft investments"

In the introduction, we described some important characteristics which an instrument to evaluate soft investments should have. It should be applicable in any given situation, provide material on which to base a rational decision about an uncertain future and it should be transparent for those involved. More specifically, it was said that all alternatives had to be decided upon on the basis of the same criterion and should take all, but only, the relevant consequences into account. Several categories of instrument can be distinguished from the literature.

First, there is the category found in human resource accounting (Lev and Schwartz, 1971), which calculates the net present value of paid wages and regards this as an indication of the value of a worker to the firm. As such it fits in with one criterion but not with the appraisal of an investment as far as the firm is concerned.

Second, there are instruments such as the balanced scorecard (Kaplan and Norton, 1996), which uses multiple dimensions to evaluate performance. Strategic goals are translated into specific performance norms that are divided into four closely related perspectives: financial, client-related, internal

and innovative. This category does not fit in with a single criterion, but is applicable with respect to the appraisal of an investment as far as the firm is concerned.

Third, instruments like total cost assessment (White *et al.*, 1993), which is a comprehensive financial analysis of life-cycle costs and savings of a pollution prevention plan, the analysis includes private costs and internalized environmental cost as well as social costs. Here, we see one criterion that is reflected but the analysis also takes external aspects into account.

We have opted for the cost-benefit analysis. Cost-benefit analysis has traditionally been concerned with the macro- or meso-levels of the economy, i.e. with the welfare of a defined society (Mishan, 1971). It is applied under conditions in which various parties are involved, each with interests of their own, but where "hierarchy" or "market" cannot be used to make a proper evaluation of alternatives. The essence of the technique is that the winners have to compensate the losers for their losses and nevertheless end up better off. This generates three questions:

(1) What parties can be involved?

(2) Who are the "winners" and who are the "losers"?

(3) How should all the (dis)advantages be evaluated in order to calculate the overall result?

Traditionally, firms are seen as institutions, each aiming at a single goal that all its members have in common. Both in sociology (action theory, cf. Perrow, 1986; organisational behaviour, cf. Buchanan and Huczynski, 1985) and in economics (agency theory, cf. Douma and Schreuder, 1991), this idea has been under attack. Although there is one single overall goal to be achieved, different departments and/or executives in a firm may have more or less conflicting subgoals. For decision making in a firm to be as rational as possible, the relevant information about such differences and information about their consequences for the overall goal should be available.

In recent years, De Haan and others have applied cost-benefit analysis to support decision making to "new" management problems within enterprises. Examples of these applications are improvement of the quality of working life (De Haan and Terra, 1988), advanced manufacturing techniques (De Haan and Peters, 1989), and greener management (De Haan and De Groene, 1993). What these fields have in common is that decisions are in new domains for the firm and/or may have repercussions in different, sometimes unexpected, departments.

They see two basic principles for cost benefit analyses at the level of the firm. First, any measure to improve the performance of a firm can be seen as an investment and thus should be evaluated accordingly. Second, only changes in the relevant items caused by the measure have to be taken into account. Firms will not become richer if they make cost-benefit analyses, but they will be better informed about what costs and/or benefits result from a measure, and in what

departments of the firm. This may lead to corrections in the budgets of the departments.

This approach is in line with Rappaport's shareholder value approach (1988), as it estimates future cash flows associated with certain business decisions. It also provides a consistency of analysis across functions, levels, and types of decisions, and is linked to familiar parameters such as net present value. This common framework enhances communication within the organisation and improves management productivity.

The approach developed in these projects by De Haan and others (1988; 1989; 1993) consists of five steps.

Step 1

A summary of the consequences of the measure under analysis, confronting the *ex post* and the *ex ante* description of the situation. To localise the measure and to identify its possible consequences in other departments of the firm, the product and/or information flow charts may be used. Often other concepts can also be used in this process, such as productivity, referring to the output and applied labour. Now the parties that may be affected are identified, so that we have the answer to question (1).

Next, those possibly involved are consulted as to whether the measure will have consequences for them, and if so, what consequences. The crucial point is that everybody is now urged to reason explicitly on the basis of their previously implicit presuppositions. Not only does this make every individual aware of the consequences, the organisation as a whole may learn from it. When the (still qualitative) opinions have been summed up, they will be discussed: contradictions, additions etc. will be cleared up. The result will be that the fragmented, implicit opinions of different executives are combined into one explicit overall view. Of course, this view does not reflect the "truth" as it deals either with the future or with a reconstruction of the past. This always implies subjective aspects: either expectations about an as yet unknown future or a reconstruction of a more or less forgotten past. By the way, this is inherent in any decision regarding the future and in any evaluation of measures taken in the past (as long as no explicit base-line document was prepared at the time). The result of this brainstorm and discussion is a list, in qualitative terms, of changes caused by the measure under analysis. With the help of this view, we can identify the "winners" and the "losers" with respect to this measure, i.e., the answer to question (2). Finally, all items in this list are categorised as occurring once or as continuing over all the project's lifetime. The project's lifetime can also be estimated now.

In the next four steps we have to rework this list so that we can calculate the overall financial result, i.e. the answer to question (3).

Step 2

Calculation of the investments of the measure (to be) implemented. Here we should not just concentrate on material, fixed and current, assets, but also pay

attention to immaterial assets such as training and structure redesign. All items that will occur only once during the project's lifetime will be assigned a price now. Part of these prices can be found in the offers of the purveyors of the goods and/or services. Internal services often are not attributed to the measure as they are "general" costs, but here we are appraising a single and specific measure, so all receipts and expenditures that are associated with it have to be taken into account. This implies that, for example, internal experts are "hired" for this measure for a number of hours and that their hour-price has to be used to calculate their contribution to the measure's cost.

Step 3

Conventional analysis of costs and benefits directly connected with the operation of the measure and its purposes. Changes can occur in existing cost categories or newly-established categories. They are relevant in so far as they make the measure work, especially at the workplace. They can also refer to the specific aim of the measure.

Historical data from the firm can give indications here, but we have to keep in mind that we are dealing with changes caused by a measure. The bookkeeping systems of a firm are not directed at the production of future-oriented information; even budgets reflect anticipations of the past. However, the aim of the measure is to change the existing situation, so we have to recalculate all items affected by the measure. For this, we have to consult the internal and/or external suppliers, both for the quantity and the price/unit of those changes. Table I contains an example of this.

The first idea is that the new situation is Dfl. 5.00 more expensive, but the operator still has to be paid. So if the operator was unable to engage in effective activities in the meantime, the costs would have been Dfl. 170.00 ($2 \times (50 + 35)$; thus the old situation would have been Dfl. 65.00 more expensive. The premise is that the engineer is a bottleneck.

Step 4

Additional analysis of all the more hidden and less expected costs and benefits: structural aspects mentioned in step 1 but not covered in step 3. Often these aspects are neglected, resulting in turning down both professionally and economically adequate measures. Data for this step have to be gathered, even more than in the previous steps, through group interviews with those involved.

When this approach is applied to the implementation of socio-technical work groups, one might find (dis)advantages, as mentioned in the introduction by

Table I. Calculating changes

Situation	Executive	Time needed (h)	Price/hour (Dfl)	Costs (Dfl)
Old	Engineer	2	50.00	100.00
New	Operator	3	35.00	105.00

Blumberg (1968). Among the major differences in the processes taking place in firms are the changes in the division of labour and the corresponding differences in co-ordination devices in use. In addition, the "softer" results may be indicated, which can only be taken into account insofar as they can be measured in quantities and added in some currency. Thus, if, for example, it is claimed that motivation will improve as a result of the implementation of socio0technical work groups, it should be possible to show this in the economic results. One result might be less absenteeism, leading to a higher output of products that can be sold in the market. Alternatively, one might observe a higher work speed, again leading to a higher output. The same holds for, for example, flexibility. It might be more expensive to change from one family of products to another, as one has to change the parallel lines, but it will be cheaper to change from one product to another within the family of products, as they are already in one parallel line. So the introduction costs of new products may increase, whereas the set-up costs for batches may decrease.

From the group interviews, a line of reasoning should result that is plausible for those involved in all these phenomena. Agreement has to be reached on the fact that in the old situation problems existed in a domain and that the measure removes their causes. The starting point is that the managers involved both know the original situation and can imagine the future situation. The explicit discussion can correct both too optimistic and too pessimistic opinions and therefore contribute to the acceptance of the measure and prevent unnecessary resistance. This step is thus of major importance in the learning process of the organisation about this measure and its consequences for future performance and behaviour.

Step 5

Economic evaluation of the measure with the help of investment selection techniques like payback period and net present value (Brealy and Myers, 1996). The former is used mainly as an indicator for the risk of an investment, whereas the latter refers to the profitability of the investment.

This is possible, as we now know all the relevant variables: the project's lifetime (step 1), amount invested (step 2) and cash flow pattern (steps 3 and 4), so we now also have the answer to question (3).

An application

In the introduction, the selection criteria for the illustrative case study were mentioned. The first criterion was that it had to be the firm's intention to implement work groups as an example of a "soft" investment. The second was that the firm had made an explicit assessment of the intended measure, albeit of a qualitative nature. Besides these, a third factor was that the firm would provide access to relevant data and thus ensure that the managers involved were willing to participate in the process. No further requirements were formulated, so as not to violate the requirement of analytical generalizability in

case-study research (Yin, 1989). VDT, a local manufacturing firm, fulfilled all the criteria, so that it could be selected as the case-study firm.

VDT was founded in 1972 as a spin-off of DAF, which at that time produced cars with continuously variable transmission. It took VDT until 1988 to achieve a level of mature sales and production of these continuously variable transmissions, and to lose its pilot-plant character.

A growing number of car-producing firms from all over the world (e.g. Volvo in Europe and Nissan in Japan) decided to integrate the continuously variable transmission in their product design. This meant that the production capacity of the plant had to be enlarged substantially from 250,000 products in 1995 to up to 800,000 in 1998. Among the means to achieve this, the management considered improved process control to be a major alternative. Machine-down time was still very high in 1995, about 40 per cent, and many products did not pass quality control. The policy was to improve the process control, gradually but continuously, with the help of growing worker motivation. The technological performance of the equipment in use was satisfactory but craftsmanship and workers' commitment were crucial to fully profit from that.

This was why the management decided to implement autonomous task groups in the production department, based on a qualitative analysis that was also communicated to the workers. The implementation process was monitored by a steering group and controlled by the training executive of the firm, assisted by an outside consultant. The steering committee, chaired by the CEO, agreed to explain the analysis to the researchers and to collaborate on the quantitative analysis.

Step 1

In the production department, in total, 120 people were working in the three sub-departments, two parts producing strings and elements respectively (working in three shifts), and the third doing the final assembly (working in two shifts). In this project, eight groups were established, each responsible during their shift for the activities of one of the sub-departments and as autonomous as possible (see Figure 1).

Each group consisted of 8-14 people and carried out production, planning, improvement as well as checking tasks. Among the tasks were quality control, maintenance, task assignment and internal co-ordination. This meant that the tasks of the middle management and supportive departments were relieved, so that they could concentrate more on the improvement task in their field. The workers in the task groups were expected to be able to execute five instead of the current two of the production tasks in their unit as well as three instead of none of the other tasks. For each of the tasks, about three workers should be available. This of course required an enormous training programme and led to higher wages, as these were related to the number of tasks a worker could perform.

Other consequences, as mentioned in the qualitative analysis, concerned supporting activities. So far, specialists carried out all maintenance, but the operators were craftsmen as well. As familiarity with the processes and with

the character of breakdowns grew, so did the possibilities of leaving these to the operators. The specialists turned more to improvements and preventive maintenance. This resulted in a longer lifetime and less machine breakdowns. Downtime per breakdown became shorter as workers started repairing immediately. The same was said about quality control.

As far as task assignment and internal co-ordination were concerned, the communication within and among related groups had to be improved. Schedules for task assignment, quality control reports, production targets and equipment utilisation figures were discussed and decided on. The results of these meetings had to be communicated.

Each of these items was discussed on a bilateral basis with the training executive and the manager(s) involved. Finally, the items were integrated and discussed as a whole with the steering committee. In this discussion possibly missing items such as reduction of buffer stocks were evaluated but rejected as not applicable in this specific case. The results, on which there was consensus, are summarised in Figure 2.

After summarising the expected changes in processes and behaviour resulting from the new work groups (step 1), a quantitative and financial analysis was made. Each of the above-mentioned items was discussed with the managers and staff members involved. This was done on a bilateral basis but on several occasions, these discussions took the form of group interviews. The final results were obtained in three stages:

(1) the items were made visible in quantifiable units;

(2) the relevant prices for these units were determined; and

(3) the researcher calculated the value.

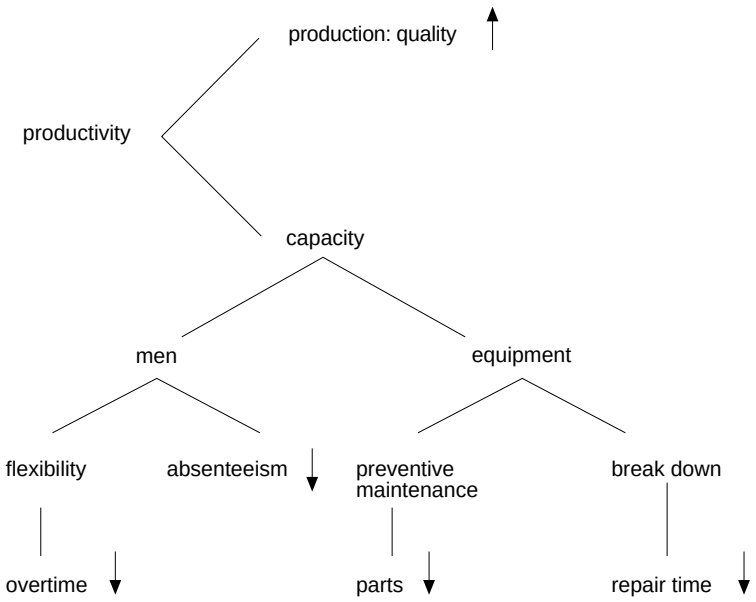

Figure 2.
Hidden consequences of the implementation of work groups at VDT

The results from the (group) interviews were fed back to the managers involved as well as to the steering committee as a whole. They reached consensus both on the type of operationalisation and on the figures. These discussions resulted in the following figures (steps 2-4).

Step 2

As a start for this project, the management faced an investment as summarised in Table II.

The costs for the introductory training were calculated, after discussion with the training executive and the production manager: number of workers; days of training and wage/hour for workers (as production could be continued, due to the shift work); number of sessions; and costs/session.

Step 3

In the final situation, we observed the directly visible consequences of the implementation. The figures per year are summarised in Table III.

The reduction of costs of machine breakdowns, to give an example, was discussed with the training executive, the production manager and the head of the maintenance department. They reached agreement on the type of breakdowns operators could (learn to) manage, the future number of breakdowns (also due to the extra preventive maintenance), time for repair, price as lost value added by the firm, since production was the bottleneck and had to be increased.

The items marked with a superscript a in Table III will gradually diminish, as indicated in Table V, due to increasing experience with the new way of working. This pattern resulted also from the discussions with the managers, but especially from the discussion of the feedback given to them.

Table II.
Investments to implement work groups

Fixed assets	Amount (Dfl)
Information tables	24,000.00
Immaterial assets: introductory training	1,095,000.00
On-the-job training	665,000.00
Total	1,784,000.00

Table III.
Direct visible consequences of the implementation wage increases

Consequences	Amount (Dfl)
Wage increases, along with training results	280,000.00
Task group meetings	133,000.00
Overstaffing task groups[a]	450,000.00
Steering group meetings[a]	46,000.00
Training executive and outside consultant[a]	217,000.00

Step 4

The figures for the more hidden consequences of the implementation were calculated (see also Figure 2) and summarised in Table IV.

Less overtime appeared an acceptable operationalization for the managers involved regarding flexibility. The main reason was that the improved process control enabled the department to meet delivery requirements within the normal working hours; hence overtime on Saturdays was no longer needed to achieve this. For the other items, similar discussions on content and feedback were organised.

Some of the items in Table IV grew gradually (e.g. spare parts) over time due to increasing experience. For others (e.g. motivation), a drawback was expected during the project, in that results were visible directly, which caused the worker's enthusiasm to sag. This was known to occur in previous projects, but these dips could be overcome. The development of the results is summarised in Table V as well. These figures were discussed in the steering committee after consensus had been reached on them with the managers involved. Especially the two patterns came up during the discussions in the steering team.

Step 5

With the cash flows presented in Table V, the investment of Dfl. 1,784,000.00 was paid back in three years and about three months. The net present value in five years and with a 20 per cent discount rate, but before taxes, equals Dfl. 1,534,000.00. These figures were again discussed in the steering committee.

Consequences	Amount (Dfl)
2 per cent more approved final products	665,000.00
Less machine down time, extra capacity 8.33 per cent	2,771,000.00
Less spare parts, preventive maintenance	300,000.00
Higher motivation, less absenteeism	82,000.00
Higher volume flexibility, less overtime	90,000.00

Table IV.
Hidden consequences of the implementation

Item	Year 1	2	3	4	5
Wage increase (–/–)	0	140	210	280	280
Group meetings (–/–)	133	133	133	133	133
Overstaffing (–/–)	450	300	180	0	0
Support (–/–)	217	152	65	22	22
Quality improvement	200	66	266	499	665
Less breakdown	831	277	1,108	2,080	2,771
Less absenteeism	25	8	33	62	82
Less spare parts	0	100	200	300	300
Less overtime	0	30	60	90	90
Total	256	–244	1,079	2,596	3,481

Table V.
Summary of the costs and benefits of the implementation of task groups at VDT

From these discussions, it was clear that they saw the payback period as quite long in view of the project's lifetime. This was interpreted as a risky investment, even more so if the cash flow in the second year was taken into consideration. This cash flow was negative and almost equalled the positive cash flow in the first year. The development of the various items was estimated, however, in a rather conservative way, which drew heavily on this second year.

The positive net present value almost equalled the amount invested; thus the investment was very profitable. This profitability, however, was caused by the big cash flows of the last two years. Each of them exceeded the total amount invested.

The overall conclusion from their discussion was that despite the conservative estimates for the items from the qualitative analysis, especially in the first part of the project, their "*Fingerspitzengefuhl*" had been correct: it was a promising measure that did pay off in the end!

Conclusions

The central problem that this article addresses is how we can integrate all domains of business policy into one overall business policy. What is crucial is that decisions in all domains are made following the same procedure as well as the same criteria. In practice, a distinction is generally made between "soft" and "hard" investments, as the former are dealt with in a "political" way and the latter in rational way. Since management means that all the business processes have to be controlled, all decisions should be made in a rational way. "Soft" investments can be decided on in a rational way by treating them as investments: the measure is taken and paid for now, but the positive effects, and thus cash flows, will show up only in the future.

Although in practice it is often said this is difficult, if not impossible, we have presented a simple step-by-step approach to the application of conventional investment selection techniques.

The crucial step is to rework the qualitative reasons that are used in the conventional "political" decision-making process into financial terms, to arrive at a rational analysis. To achieve collectively accepted estimates, a number of activities have to be carried out. First, the relevant parties, i.e. those that are affected by the measure either in a positive or a negative way, have to be identified. In effect, these "winners" have to compensate the "losers" for their losses and still be better off. This implies that all positive as well as negative items have to be summed up, and agreement has to be reached on them. Next, these items have to be operationalised in such a way that the parties involved can reach consensus. Finally, they have to decide on tariffs and/or prices to upgrade the quantities into financial figures. This procedure ensures valid results for those involved, as these figures represent their understanding of the situation. It is also a reliable procedure as all those involved have been engaged in every step of it.

When we have found the financial figures, we can use the conventional investment techniques. This implies that we can take rational decisions on the

measure involved, using the same criteria of profitability and risk to judge them. As every decision is taken to change a situation, there will be consequences at other moments in time than the decision-making moment. So we can apply this approach to every domain of business policy.

Of course, we have to consider that this approach only gives casuistic results, since the decision is taken in a specific setting and has consequences in that setting. So the result of the application is limited to time and place conditions as well as the bounded rationality of those involved.

From this illustrative case study, we can derive the following observations:

- the implementation of task groups can be seen as an investment, albeit a "soft"one;
- in this case it appears to be a risky but profitable investment;
- the managers involved see the results as valid, for their situation, and accept some items as proposed in the literature, while rejecting others (e.g. buffer stocks, cf. Karlsson, 1995).

As a final conclusion, we can say that this simple step-by-step approach facilitates a truly integrated overall business policy, as decisions in all domains of business, whether they are "hard" or "soft", can be dealt with in the same, rational way.

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