# Quantifying the Soft Issues: A Case Study In the Banking Industry

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## Abstract

Quantification of causal models that contain many so-called "soft" variables is often problematic because so few "hard" data are available to calibrate the model. This paper describes a case study in which different techniques were used to quantify a causal model that contained a number of such soft variables, such as "level of expected customer irritation", or "effort required to reach branch office". The case study itself concerned the development of a decision-support system to assess branch office viability for a medium-sized bank. The specific techniques used for quantification are part of the standard "tool set" of the Participative Business Modelling (PBM) Method, the synergistic blend of system dynamics and group knowledge elicitation techniques developed by the author in a series of six case studies, of which this was the fifth.

## Introduction

Modern commercial banks possess a wealth of data regarding the behaviour of their clientele. Marketing managers of industrial firms would give anything to know in such detail when, where and how their customers spend their money, and when and where from these customers receive their money. Thanks to advances in information technology, banks can dig up these data with relative ease from their own accounting systems, which may well be described as "digital gold mines".

These computerised data can be of great value in strategic decision-making. And, nowadays, European banks have quite some strategic decisions to make. After decades of relative tranquillity and prosperity, the banking industry finds itself now in a highly competitive market with rapid decreasing customer loyalty on the one hand, and a broad supply of promising innovative technology on the other hand.

Unfortunately, as it turns out, these computerised data are not enough for strategic decisions. Useful as they may be, they provide information on only a part of most strategic issues, for almost every strategic decision consists not only of so-called "hard" issues, where these computerised data can tell a great deal about, but also of many "soft" issues, on which they provide little direct information. Examples of such soft issues are intangibles such as "perceived customer effort for reaching branch office", "customer irritation", "attractiveness of the office building" and so on. Moreover, these soft issues are often of more crucial importance than the hard data: "while hard data may inform the intellect, it is largely soft data that generate wisdom"

(Mintzberg 1994). This is what managers in the banking industry complain about when they talk about inadequate decision-support tools: they receive loads of data on some of the hard issues, but they have nothing to confirm or challenge their managerial intuition with regarding the soft issues.

Clearly approaches are needed that can address and integrate both the hard and the soft aspects of strategic decisions. This paper describes a case study in which such an approach, based upon system dynamics modelling and group knowledge elicitation techniques, was applied successfully in the development of a decision-support system for a European commercial bank. Special attention is given to practical guidelines and examples of how to translate a complex, "soft" issue into a quantitative decision-support system.

## The Client Company and Its Problem

The client company was a medium-sized European bank. Its management structure was strongly decentralised, with much autonomy for management teams at local branch offices. At the time of this project, the company was going through an extensive streamlining operation, in which the local branches were being examined by a project team of internal consultants for possible cost-cutting opportunities. It was often found that some of the smaller neighbourhood offices of the local branch were loss-making: too few clients utilised them for too few services. Would it not be better to close such offices and refer the customers to another office in the vicinity? Analysis of the available hard data could easily show the direct savings of doing so, but often the local bank managers would object to such a financially oriented conclusion. Their main worry was: "The direct savings are fine, but how will our customers react to this closure?" Here the available information was less helpful. Although there were extensive data on such facts as wealth distribution and service usage patterns for different consumer categories in different areas, these still said little about how people would actually react. Nevertheless, the local managers had to make a decision taking into account *all* aspects, both soft and hard. In the past, in the absence of better information discussions on these issues had dragged on for years, but under the present cost-cutting program swifter decision-making was required.

## The Participative Business Modelling Method

The modelling approach used in this project is called "Participative Business Modelling" or "PBM" (Akkermans 1995). In PBM, a group of people facing a strategic problem develops a model of that problem in a series of group model-building sessions, facilitated by one or more experienced modellers / process facilitators. Modelling in PBM moves gradually from very informal, qualitative and conceptual models to more and more formal, quantitative simulation models. PBM contains techniques and guidelines for this whole modelling process. Probably the easiest way of discussing these is by looking at the PBM method as being articulated on four different levels:

*Level 1: PBM consultant attitude*

Fundamental to any PBM project is the *attitude* the consultant must bring to work with PBM successfully. Crucial as the 'right' attitude is to successful conduct of any PBM project, this is, unfortunately, something that can only be learned experientially, not from a textbook. The three essential aspects of the 'right' attitude are:

- professionalism;
- process consulting; and
- systems thinking.

These three aspects are interrelated in the following manner. In any serious management consulting – or business modelling – project, one needs a professional attitude. Within management consulting, different kinds or styles of consulting are distinguished. One such style is "process consulting", which is often contrasted with so-called "expert consulting". All consultants who conduct process consulting projects should display what Edgar Schein, the developer of the concept, calls "a helping perspective" (Schein 1969). Finally, PBM can be seen as one of a small number of management consulting approaches in which, in addition to a process consulting attitude, systems thinking, and in particular the system dynamics methodology, is considered very important.

*Level 2: The PBM Tool set*

Armed with the proper attitude, the PBM consultant is ready to apply the various techniques that are in the PBM tool set, i.e. the set of individual techniques that are employed in PBM projects, which are summarised in Figure 1.

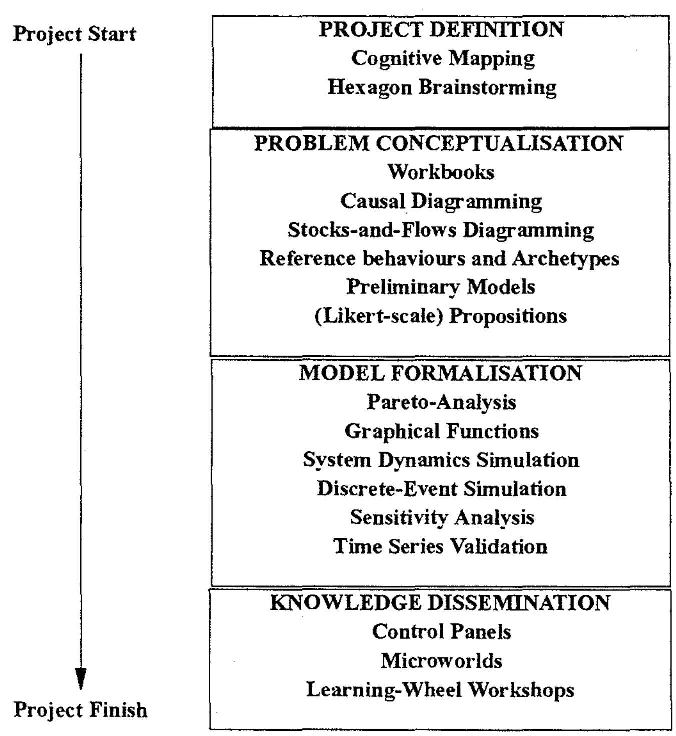


Figure 1: PBM techniques by project phase

These techniques themselves are mostly well described in the literature (e.g. Richardson and Pugh 1981, High Performance Systems 1994, Morecroft and Sterman

1994). Here we will focus on techniques that are used specifically to quantify – soft – conceptual models, the main theme of this paper.

*Level 3: Generic PBM project design*
How these are combined into a generic project design is explained at the third level. This generic design described "the average PBM project", knowing well that it does not exist. A generic PBM project consists of four stages, which were already identified in Figure 1.

1. In the problem definition phase the consultant finds out, together with the group of participants, what this problem is really about and how the rest of the project is best executed.
2. In the problem conceptualisation phase, a conceptual, i.e. non-quantified model is developed of the problem (in this case, assessing branch office viability in banking), using a number of different graphical modelling and knowledge elicitation techniques from the PBM tool set.
3. In the model formalisation phase this conceptual model is translated into a quantified simulation model with which various policy experiments are conducted.
4. In the knowledge dissemination phase findings from the three previous phases are disseminated over a wider part of the client organisation.

*Level 4: PBM Project Design Guidelines*
At the highest level we find various kinds of PBM design guidelines, which aim to give advice on how one deals with various contingencies, and what sorts of trade-offs one has to make when tailoring the method to a specific problem and a specific organisation. These are out of the scope of the current paper, but are discussed at length in Akkermans (1995).

## Project Synopsis

This project was the fifth in a series of six case studies in which the PBM method was gradually refined (Akkermans 1993, Akkermans, Vennix and Rouwette 1993, Akkermans 1994, Akkermans and Bosker 1994). This fifth case was far larger and more ambitious than the four preceding projects. Therefore, it made sense to cut it up into three separate phases, the end of each phase being marked by a steering group meeting which took a 'go no-go' decision for the next phase.

In the first phase, a qualitative conceptual model was developed in a number of structured workshops with internal experts in the content manner at hand and two local bank managers. The resulting model contained all the main factors and relationships the participants had defined as relevant to the issue.

In the second phase, the conceptual model was quantified in a further series of workshops, and was applied, refined and validated in two actual decision-making processes by local branch management teams.

In the third phase, this refined model was then embedded in a more user-friendly decision-support system (DSS). Also, a structured policy workshop format was developed to lead local management teams through the various steps in the DSS. And finally, the internal consulting group was trained in the use of the DSS and the policy workshop.

As will become clear from the following, this project was a veritable showcase of PBM techniques. Not only was every technique from the toolset used (this is in itself not surprising, bearing in mind the size of the project, which was three times that of most of the preceding projects), but also the techniques worked well up to very well. Evidently the PBM method had matured by the time this project was started; the lessons from the previous cases were learnt well.

## Quantifying the Soft Issues

In this paper, special attention is given to techniques by which many of the soft issues that were relevant to this problem were captured in a quantified decision-support system. In fact, there were at least five different techniques that were used for this purpose:

*1. Mapping soft issues in causal diagrams*

In the conceptual modelling phase, all the factors and relations that appeared to be relevant from the interviews and group sessions were mapped down in causal diagrams. Figure 2 gives an example of such a diagram for the part of the model that dealt with the effects of branch office closure on the effort required from customers to reach the next nearest branch office, that is, on office accessibility for customer groups.

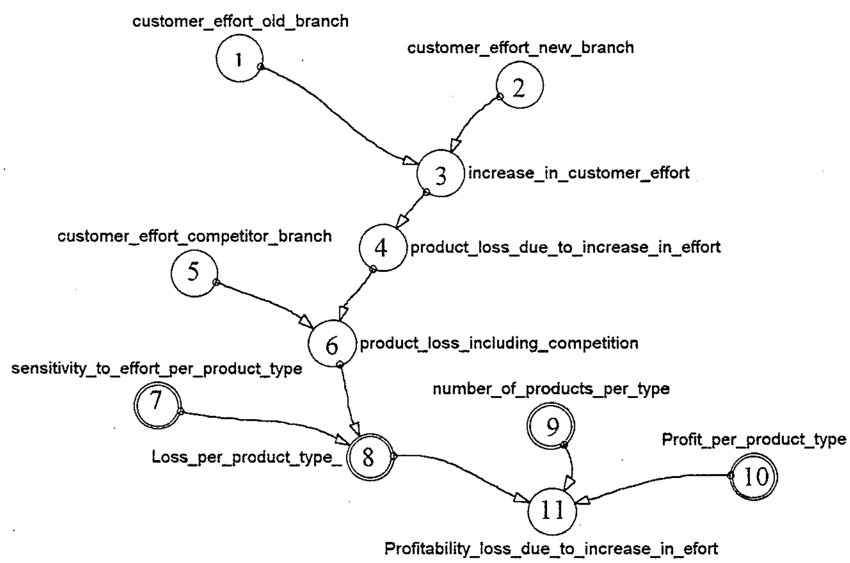


Figure 2: Causal diagram showing effects on profitability of increased customer effort after closure

This diagram can be read as follows: the bigger the difference (3) between the effort required to reach the old (1) and the new branch office (2) (increase_in_customer_effort), the higher the losses of products – such as savings accounts, or insurances – due to increased customer effort (4) . The better the accessibility of the nearest branch office of a competitor (5: customer_effort_competitor_branch), the higher these losses will be (6). Not every product type is equally sensitive to such a decrease in accessibility (7). For instance, very few people will cancel their mortgage loan because their local branch office is closed down, but many parents will switch the savings accounts of their children if these have to walk a long way to the bank. In this way, losses per product type can be determined (8), which can be multiplied by the number of each product type sold in this area (9) and the profitability per product type (10). In this way, an estimate of overall profitability loss due to increased customer effort can be obtained (11).

*2. Converting soft relations into scales*

In fact, the diagram shown in Figure 3 appeared in the final version for the model. Earlier diagrams included many more factors, such as the location within a shopping centre, or the quality of the shops nearby, the availability of parking space, the proximity of a large road, and the age and wealth distribution of the local population. But, gradually, the team worked to incorporate all such considerations into a small number of five-point scales, such as the one shown in Exhibit 1 for levels of potential customer irritation, another crucial element in the estimation of expected profitability losses after office closure (A similar five-point scale was developed for branch office accessibility, variables 1,2 and 5 from Figure 2.)

1. *Minimal irritation*. No reaction on closure. Atmosphere of silent agreement.
2. *Modest irritation*: Customer irritation is voiced by clients complaining at the counter. Verbal reactions, which do not result in actions.
3. *Normal irritation*: Considerable number of verbal complaints from customers. Some local bank managers are approached individually by customers.
4. *High irritation*: Great number of individual complaints, voiced also in local newspapers. Local shareholders start asking questions at local board meetings. This level results in actions, in the preceding three irritation remained verbal.
5. *Very high irritation*: The main difference with high irritation is that here organised group actions take place. A great deal of publicity, organised opposition in board meetings and other political activities.

Exhibit 1: A five-point scale of levels of client irritation in response to branch office closure

The definitions of these five-point scales were once again very much a group activity, taking place in workshops, with the bank experts jointly agreeing on adequate formulations of each subsequent level.

*3. Developing graphical functions*

When the variables in the conceptual model have been given quantified ranges in this manner, it becomes possible to create graphical functions for the relations between variables. For instance, Figure 3 shows the graphical function for the relation "customer_irritation → lost sales_of_product_type_1", with customer_irritation having possible values between 1 and 5, as was shown in Exhibit 1.

This particular graph – and several others – were derived once again in the group modelling workshops that have such a central place in PBM projects. Constructing graphical functions for such soft relations in a group session with six experts was not always easy, but, in the end, full consensus could be reached.

Procedures for arriving at a graphical function – even for a relation as soft as this one – have been described elsewhere (High Performance Systems 1994, Akkermans 1995), but the main idea is that:

- One starts by assigning ranges to the X and Y axis for the two variables under study. If these are hard to determine, one can take a range between 0 and 1, with 0 being "minimal" and 1 being "maximal" (or, as in this case, between 1 and 5).
- Then one determines the "average" situation: If X is currently at this point, then what is Y? If it is hard to denote a single value, one draws a hi-low bar to indicate the plausible range of Y values.

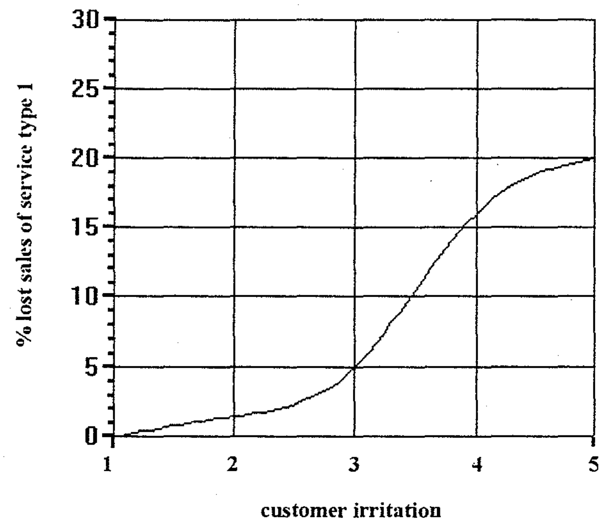


Figure 3: A graphical function for the "soft" relation of the effect of customer irritation on profitability

- Next one looks at extreme values of X: X=0 and X=maximal and determines corresponding values of Y in a similar manner.
- One repeats this procedure for various intermediate points.
- At this point it is useful to consider whether there is any reason to suppose the relationship would have a particular general shape. Is it linear or non-linear? In this case, an S-curve was judged as most plausible: at low levels of irritation, minimal losses will occur; then there is a level of irritation at which most of the "defections" to competitors will take place. But in the end, most customers will not go so far as to actually take their deposits or debts away from the bank, regardless of how irritated they get (because doing so costs them money, of course).
- Armed with this knowledge, one now tries to draw a line through more or less the mid points of the scatter bars of Y values that have been determined for the various values of X. This becomes the graphical function.

*4. Constructing control panels*

In this manner, the team was able to develop a runnable simulation model in a system dynamics language, which was used and calibrated in two internal consulting projects where actual decisions regarding branch offices had to be made. Nevertheless, this simulation model still needed a person well-trained in the use of the specific modelling methodology and software, whereas the model would have to be used by internal consultants, not by modelling experts.

Therefore, the simulation model was embedded in a user-friendly software shell. In this shell, interaction with the model took place via so-called "control panels" (High Performance Systems 1994, Akkermans 1995). Figure 4 show what became of the causal diagram of Figure 2 in this shell.

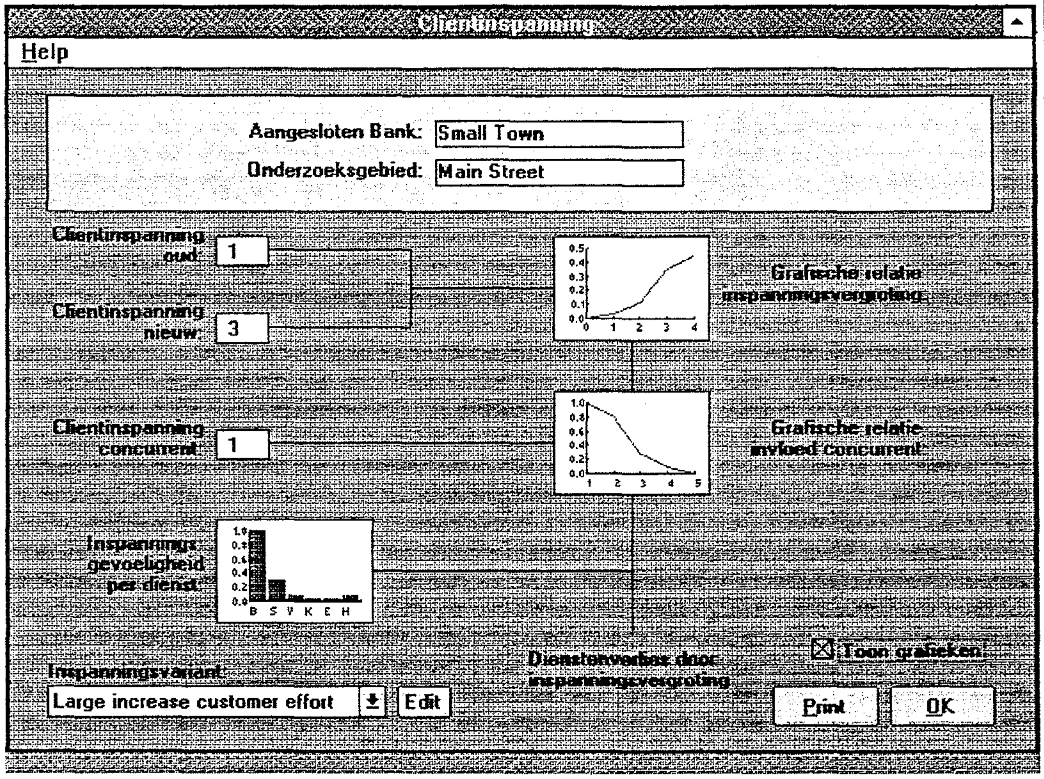


Figure 4: A control panel to quantify effects of increased customer effort on profitability (cf. Figure 2)

What remains from the causal diagrams are the variable names and the connections between them. Added are visualisations of the values used in the current scenario. All values, also those of the graphical functions, can be changed by the users by mouse-clicking on the relevant part of the screen.

## 5. *Conducting learning-wheel workshops*

The internal consultants were trained in the use of this software and the associated manual. Also, they were trained in how to conduct a so-called "learning-wheel workshop" (Byrne and Davis 1991, Akkermans 1994) with the aid of the software. In a learning-wheel workshop, values for key parameters are systematically changed. After each change, participants are asked for their expectations of resulting system behaviour. Then the model is run with the new values. If the model outcome is identical to the predicted outcome, then so much for the better: management intuition is confirmed and confidence in the model is increased. If the two differ, the group investigates the structure of the model to find out why behaviour was different: an opportunity for management learning occurs. Next the wheel recommences; a new variable is changed, estimates are made and the process is repeated.

This also happened in the learning-wheel workshops in this case. Figure 5 shows the different scenarios that were run every time the model was used with management.

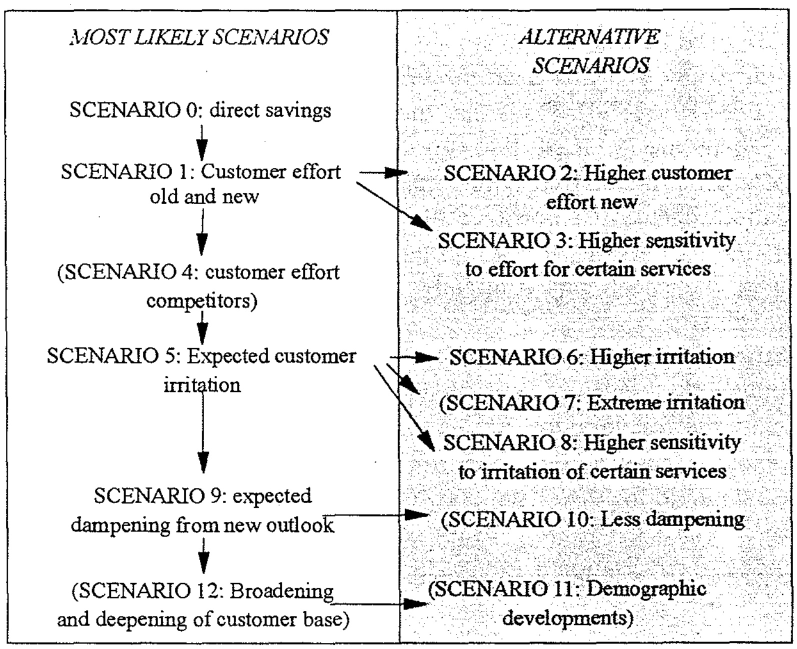


Figure 5: The structure of the learning-wheel workshop in this case

Here all the scenarios shown in the right hand column are basically sensitivity analyses. For each of the values determined for the scenarios in the left-hand column, the "base values" one or two more pessimistic values were tested. For instance, in Scenario 5 the expected level of customer irritation is determined, but in Scenarios 6 and 7 the effects of higher levels of irritation are discussed as well.

This way of interacting with the model turned out to be quite successful; not only did it structure discussions with management considerable, it also proved to be very reassuring for bank management: whenever there were critical assumptions in the model they knew where to find them, whilst they also knew which assumptions appeared not to be critical.

## Project Results

This project was a very successful one in at least two respects. Firstly and most importantly, it was deemed successful from the perspective of the participants: post-project interviews have pictured the process as effective and a highly instructive experience for all involved. Despite the presence of the external consultants, there was a strong feeling of ownership of the final result. Despite the inherent 'softness' of many of the issues, there was confidence in the quality of the model, as became apparent from the case evaluation process that was carried out for this project and which was primarily based on in-depth analysis of the evaluation interviews with participants (See Akkermans (1995) for a more detailed description of the case evaluation process, which leans heavily upon the qualitative research framework developed by Miles and Huberman 1984).

Secondly, the project has also been a success from a business and implementation perspective: the DSS and the policy workshop format have subsequently been applied to several dozens of decisions by different local management teams at the client company.

## Conclusion

This paper has tried to show that it is always possible to quantify a causal model, even for the softest of issues, and that such models can be put to good use in practice (cf. Sterman 1991, Forrester 1994). Does that mean that one should always quantify? No, certainly not. There are at least two good reasons for confining oneself to the development of a good, qualitative, conceptual model:

1. Quantification represents a considerable investment of *time*, so it has to be worth the effort. In other words, if conceptual modelling delivers adequate answers to the problem the client was originally facing, further modelling will not yield additional value.
2. Quantification may appear *artificial* if one is modelling a very soft issue. In many cases – unlike the company described in this paper – clients will not expect a quantified model for very soft issues, in contrast to the expectations for a very 'hard' problem. However, this does not mean that model builders / consultants should not stand up for their own convictions; if one feels that the group may still be missing an essential dynamic insight, one should of course try to get the group into the model formalisation stage, however difficult that may be.

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