Clients' Opinions on Group Model-Building: An Exploratory Study

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Introduction

Building models of strategic issues with a group of the stakeholders has become an established approach to support strategic decision-making. Involving these stakeholders helps to generate relevant information regarding the issue and at the same time creates ownership of and consensus on the resulting group recommendations for dealing with the issue. In this way, group model-building creates managerial commitment to implement these recommendations.

In the last decade, the system dynamics community has made considerable progress in developing tools and techniques to support this group model-building process (e.g. Morecroft and Sterman 1994, Vennix 1996). Graphical facilitation techniques such as causal diagrams, stocks-and-flows diagrams and graphical functions are used in combination with guidelines for structuring and facilitating group sessions, group knowledge elicitation techniques and appropriate consulting roles. Success stories abound on the application of these refined approaches to support corporate decision-making, also in our scientific journals.

Nevertheless, we have rarely asked our clients if they are as enthusiastic about this group model-building as we, the consultants, are. That is to say, we have not often bothered to do so in a systematic and rigorous manner. There are of course many anecdotes of managerial appreciation of group model-building approaches using system dynamics. Unfortunately, those are insufficient for a number of reasons. Firstly, consultants remain suspect sources of information on clients' perceptions since they have a personal interest in emphasizing good news and downplaying bad news. Secondly, superficial answers on questions like "how did you like it" are bound to miss much of the richness of information that systematic interviewing and analysis can deliver. And thirdly, when these questions are asked by the consultant, clients may be inclined to give socially correct answers, that is, try not to make offensive remarks about failures or expectations that were not met.

In this paper an exploratory study is described in which clients' opinions were asked by independent interviewers in extensive, structured, post-project interviews. These interviews were transcribed and these texts were analyzed systematically. The findings themselves seem, in general, to confirm a number of the assumptions commonly made in the field, but at the same time do sharpen them as well.

Research Methodology

Multiple Case Study Design

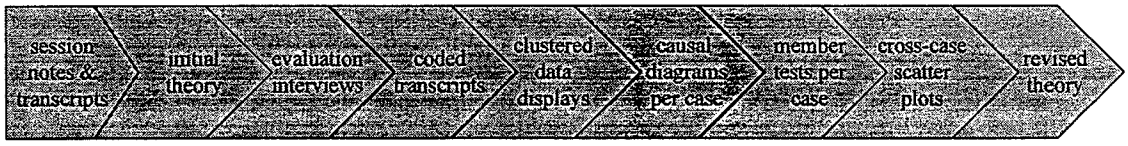
Over a period of two and a half years, six commercial model-building projects were conducted by the first author; the second author collaborated in the second project. Each of these case studies has been described in separate publications, many for a system dynamics audience, so they will not be discussed at length here. These case studies varied widely in scope, content matter, client type and many other characteristics, but in all six case studies the same modeling approach was used, called Participative Business Modeling or PBM (Akkermans 1995a). This PBM method blends system dynamics modeling with a non-expert mode of process consultation (Schein 1969, Vennix 1996) to ensure maximum client participation and ownership of results.

1. The first project was on cycle time reduction in newspaper distribution (Akkermans 1994),
2. the second one on creating a more collaborative attitude between independent business unit managers in an IT company (Vennix, Akkermans and Rouwette 1996),
3. the third concerned a logistics strategy for a pharmaceutical company (Akkermans 1995b),
4. the fourth an implementation plan for a corporate strategy in the service industry (Akkermans and Bosker 1994),
5. the fifth rationalization of branch office networks in banking (Akkermans 1995c) and
6. the sixth supply chain management strategy in electronics (Akkermans 1995a).

Evaluation Procedure

The evaluation procedure for this study was both exploratory and extensive. Exploratory, because very little similar research had been conducted in the past, which also led to a large number of variables to be taken into account, and extensive, because of this broad focus and the huge amount of text material that had to be processed. Figure 1 shows the main steps taken in this evaluation process, or rather, the outputs of each step.

Figure 1: Main steps in the case evaluation process



1. *Session notes and tape recordings* were the direct output of conducting the cases themselves. The researchers noted observations and memos during the process, and most of the group model-building sessions were taped and these recordings were transcribed afterwards.
2. *An initial theory* of what determined strategic decision-making effectiveness in these modeling projects was constructed by the researchers. This theory was based upon the existing literature and upon their experiences and discussions during the cases. This theory was formulated as a causal diagram.
3. *Evaluation interviews* were conducted guided by this theory: on the basis of the concepts and hypotheses distinguished by the researchers, interview questions were formulated. Most of the participants in all six cases were interviewed, and their answers were also taped and transcribed.
4. *Coded transcripts* were the result of a labor intensive process of checking all the transcripts of the interviews and sessions (a total of some 70 hours of spoken word) for references to the sixty-odd concepts from the initial theory.

5. *Clustered data displays* were constructed in an elaborate process of grouping related references in the data sources (e.g. from session A or evaluation interview B), making summaries of these references, both verbally and quantitatively (with plusses and minuses), and then grouping these summaries again in a higher level table or "data display" (Miles and Huberman 1984).
6. *Causal diagrams per case*. A separate stream of analysis was focused on not the values of the concepts themselves, but on the causal relations between concepts. Data sources were also searched for examples of causal reasoning, e.g. "Process facilitation was very good and this made us communicate effectively".
7. *Member tests per case* were conducted after this causal analysis had been finished.The feedback from these member checks led to additional changes in the case assessments.
8. *Cross-case scatter plots* were a key element in the cross-case analysis process that started next. As shown in Figure 2, we set out the values assigned to concept A from our theory against the values for concept B, to find out if the assumed relation between them held up across our six cases.
9. *Revised theory*. Cross-case analyses were conducted for all the sixty-odd relations in our initial theory. Then, in a final inductive effort, those relations that turned out to hold up across the six cases, were grouped into so-called "causal chains" (Miles and Huberman 1984), that summarized the revised theory.

Main findings

Fairly successful projects overall

In general, the results of these six projects were fairly positive. Table 1 shows how the six cases scored on the four key elements of strategic decision-making effectiveness that were distinguished. It shows that only Case 4 was a clear failure, albeit a failure that generated important insights for the researchers and improvements to the version of the PBM method used up to that point.

Table 1. Strategic decision-making effectiveness by case

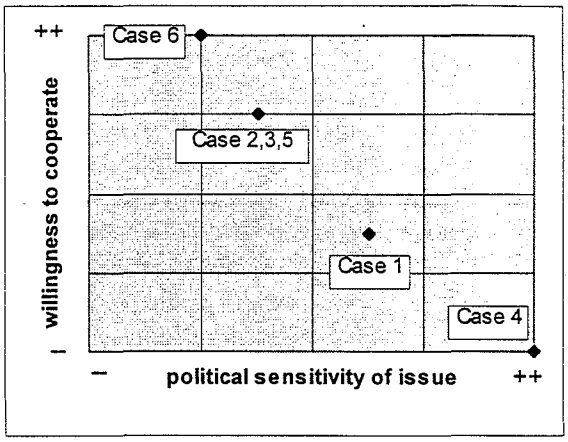
Overall concept	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Process Effectiveness	+	+	-/+	--	+	+/-
Model Quality	+	-/+	+	-	+	+/-
Organizational Platform	++	+	++/+	--	++/+	++/-
Implementation Results	++	+/-	+	-/+	+	-/+

At a more detailed level of analysis, the three key findings should be mentioned:

Client participation creates ownership and commitment

Firstly, it was confirmed that management participation in the modeling process does lead to greater commitment to implement the project findings, because there is higher ownership of the model developed and its implications. However, it is not sufficient for managers merely to be present at these sessions. There also has to be a genuine willingness to cooperate and communicate openly regarding the issue with other stakeholders. This willingness is reduced if the process involves increased career risks or if problem urgency decreases. Figure 2 shows a scatter plot of the scores for "political sensitivity" and "willingness to cooperate" .

Figure 2: A scatter plot of political sensitivity and willingness to cooperate



Communication generates learning

Secondly, the crucial role of open communication was reasserted. Openness of communication appears to be crucial to obtaining real insights into the problem, to learning. In the majority of cases, participants indicated that substantial insights were obtained. Interestingly, this assessment contrasts with findings of Verburgh (1994) and Vennix (1990).

Quantification and simulation improve decision quality

Thirdly, clients indicated that they felt computer simulation did lead to better decisions, even for such hard-to-quantify issues as those faced in some of the projects. This improved quality of the models, and their implications, gives rise to higher confidence in the decisions to be made and therefore contributes indirectly to organizational platform for implementation.

Literature references

AKKERMANS, H.A. (1994) "Participative Business Modeling to Support Strategic Decision Making in Operations - A Case Study", *International Journal of Operations & Production Management* Vol. 13, No. 10, pp. 34-48.

AKKERMANS, H.A. AND BOSKER, J. (1994) "Design Guidelines for Participative Business Modeling Projects; Lessons from an Unsuccessful Case Study". In: *Proceedings 1995 International System Dynamics Conference. Problem Solving Methodologies,* pp. 15-24.

AKKERMANS, H.A. (1995a) *Modeling with Managers. Participative Business Modeling for Effective Strategic Decision-Making,* Doctoral Dissertation, Eindhoven University of Technology.

AKKERMANS, H.A. (1995b) "Developing A Logistics Strategy Through Participative Business Modeling", *International Journal of Operations & Production Management* Vol. 15, No. 11, pp. 100-112.

AKKERMANS, H.A. (1995) "Quantifying the Soft Issues. A Case Study in the Banking Industry" in: T. Shimada, K. Saeed (eds.) : *System Dynamics '95*, pp. 313-322 Tokyo, July 1995.

MILES, M., HUBERMAN, A.M. (1984) *Qualitative Data Analysis. A Sourcebook of New Methods.* Sage, London.

MORECROFT, J.D.W. AND STERMAN, J.D. (eds.) (1994) *Modeling for Learning Organizations*, Productivity Press, Portland.

SCHEIN, E.H. (1969) *Process Consultation: Its Role in Organization Development.* Addison Wesley, Reading Mass.

VENNIX, J.A.M. (1990) *Mental Models and Computer Models: Design and Evaluation of a Computer-Based Learning Environment for Policy Making.* Doctoral Dissertation, Katholieke Universiteit Nijmegen.

VENNIX, J.A.M., AKKERMANS, H.A., ROUWETTE, E. (1996) "Group Model-Building to Facilitate Organizational Change: An Exploratory Study", *System Dynamics Review* Vol. 12, Nr 1, pp. 39-58.

VENNIX, J.A.M. (1996) : *Group Model-Building. Facilitating Team Learning Using System Dynamics*, Wiley, Chichester.

VERBURGH, L. (1994) *Participative Policy Modelling, Applied to the Health Care Insurance Industry.* Doctoral Dissertation, Katholieke Universiteit Nijmegen.