Consensus Building in the Planning Process

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Abstract

This paper examines the role that building and using a *System Dynamics* model plays in developing consensus within management teams facing key strategic decisions. It considers the concept of the shared view that emerges within the team as their individual views of the company, its industry, and the socio-economic climate are articulated and compared as part of the model development process. Examples are given based on two actual consulting assignments in which differing views held within the team concerning the competitive environment and the general outlook for the business initially pointed to quite different strategies. During these studies the emergence of consensus and an agreed strategy was considered a major benefit alongside the forecasts and quantitative evaluations the model provided. By adding to the commitment of the team, by assisting in the communication with others and in improving human resource management and organisation design, the approach also offers further benefit in the implementation phase of strategy management.

In its analysis and use of examples drawn from consulting situations, this paper has emphasised the dual benefit of this approach in the *hard* sense of providing forecasts and an objective framework for quantitative evaluations, and the *soft* sense in terms of building consensus in the management team.

Introduction

This paper describes the role of *System Dynamics* in developing consensus amongst a company's senior management. Consensus on the nature of the business environment and on the impact of future events, including their own actions, is essential in the process of making key decisions, both to maximize the use of the group's knowledge and expertise, and to ensure commitment in implementing new policies and strategies. The process of *System Dynamics* modelling offers a much more powerful medium for moving towards consensus than qualitative techniques like "brainstorming", "executive panels", and the "Delphi method".

This paper reviews how the development and use of *System Dynamics* models contrasts with these other techniques in contributing to consensus in the three phases of making key decisions:

1) The conceptualisation of the model focuses attention and draws out a **shared view** on the key driving forces that determine the future of the industry/business and the company's relative performance.

2) The development of a "most likely" outlook for the business and company based on forecasts derived from the model provides a **common basis** for assessing impacts of external events (e.g. in the economy or energy prices) and of the company's future actions.

3) Evaluation of actions and options available to the company by scenario analysis with the model, including quantification of the impacts, leads to an **agreed strategy** for the company.

The Shared View

Very few key strategic decisions are made by one manager alone; even when one individual carries ultimate responsibility he or she will rely on colleagues to provide inputs to the strategy formulation and evaluation process, and will rely on the team to ensure successful implementation. Each member of the team will start with a "view" of the situation.

A view is the knowledge, information, and data the manager possesses about the company, its competitors, the business/industry in which the firm operates, the economic and socio-political environment, and the future. Each executive's view is based on and developed from his or her individual background and experience, an individual knowledge base, personal access to information and data, the unique interaction with others, understanding of the processes and dynamics of the business, and the individual's selectivity in interpretation.

Each executive's view is therefore:

- different to all the others
- imperfect and incomplete.

Each view is highly complex and wide ranging and usually extremely difficult to articulate. However a **shared view** of the key driving forces in the business is essential to the management team if they are to move forward to formulate and implement the most successful strategies.

System Dynamics Modelling within the Planning Process

The development of a *System Dynamics* model is a highly interactive process between members of the planning team, experts within and outside the company and the modeller. In the industrial situations in the author's experience the modeller has been an external agent either within a corporate support function or an external consultant. In this process the views of the individual managers are articulated then coalesced, along with supporting views from the experts, through a process involving:

- representation of company and business/industry structures
- capturing of decision processes

- specification of best guess and alternate scenarios for the economic and competitive environment
- simulation of the business with the model to predict system behaviour
- reconciliation of behaviour/performance with structure and decision processes

The richness of the interactions that take place during this process is what makes the approach such a powerful tool. In many respects the stages in the development of a *System Dynamics* model provide a language for the articulation of views so that elements of the interaction that may be of the brainstorming or executive panel type.The interactions between individuals within the group, and between the group and external groups or individuals take the form of:

- interviews and discussions concerning the different views held by team members
- highlighting of issues and inconsistencies
- review and refinement of diagrammatical representations of structures and decision processes
- review of model generated behaviour of the business
- review of the model's predicted "most likely future"
- experimentation with structures and scenarios: "what if ...?" questions
- developing a shared understanding of the dynamics of the business

In the situation where it is possible to construct the model to a significant degree from generic structures, then the mechanism exists to import the knowledge that is already captured within those structures. In this respect the interaction with the modeller and the incorporation of the generic elements forms the sort of hybrid expert system described by Winch(1989).

Emergence and Resolution of Group Issues

Throughout the process issues, disagreements and inconsistencies will emerge. These issues can be broadly divided into two categories:

TYPE 1 Views held by different managers do not coincide, leading to different interpretations of the situation

TYPE 2 The collective views are incomplete or unrefined

The phases of model development, and the interactions described earlier which involve graphical presentations of the system structure (causal-loop diagrams, flow diagrams), possibly quantitative representations of relationships through equations and table functions, and graphic exposition of system behaviour with output graphs and perhaps STELLA animations provide the media for the resolution of these issues. In the former case (Type 1) the developing of the "shared view" within the management team and the consequent availability of a perceived **objective** framework whereby impacts of the contentious features can be assessed and debated permits issue resolution. With Type 2 model development and runs, particularly sensitivity analysis sharpens the focus on imperfect knowledge and data.

Examples drawn from Consulting Situations

Two brief cases are outlined here drawn from consulting assignments in which the development of system Dynamics models was a central element. In each case the emergence of a consensus amongst the planning team was perceived as of major value. In each case widely divergent views were held by key members of the team, derived from their different perspectives of the company's position and the market prospects.

Case 1

A company producing a chemical product was evaluating a major investment that could lead to a significant reduction in manufacturing costs. the increased margin generated was the basis for the justification of the investment expenditure. An alternate view was proposed, namely that the cost saving be used to reduce price, thereby enabling the company to "buy" market share - reduced margins but on a larger volume potentially yielding even better returns.

A complex competitive model was constructed on a bottom-up basis, aggregating individual competitor sectors to represent the industry as a whole; this model was used to evaluate the project from both perspectives. The model included representations of producers' investment decisions, processes, technology enhancement, and pricing. It showed that a price cut by the client company of the size suggested would result in severe retaliatory price cutting by competitors; insufficient increased volume would be achieved to warrant the loss of margin.

Sensitivity analysis showed a policy of passing on 40% of the cost reduction to customers to be optimum, achieving growing market share without instigating an aggressive price war.

In the longer term this policy would generate higher returns enabling further technical improvements to the product to maintain competitive advantage as competitors responded in due course with cost reduction investment of their own.

The second case concerned a company facing a major decision concerning its position in a business that depended on the short/medium term outlook for the business, and how the company should position itself for the longer term.

Case 2

A petrochemical company produced a commodity product on two sites, and was in the process of reviewing these operations. In particular it was examining a significant investment to reduce energy costs at one plant which used an older and less efficient process. This strategy would maintain the company's "nameplate" productive capacity and reduce its average unit manufacturing cost.

An alternate view was expounded that with plant production at below full utilisation, and a general over-capacity in the industry, any increased margins would not be significant and could be wiped out by any further reduction in utilisation. Further it did not give sufficient flexibility to increase market share and hence to improve utilisation in order to spread fixed costs and increase margin in this way.

The decision indicated by this view was to shut down the older plant. This would reduce the overall cost of this commodity product by eliminating the higher unit costs at the older plant. It also enabled the company to push up utilisation in the newer plant to around the 100% mark, further enhancing the margin. This would lead to a more profitable but, in the short term, a smaller business. This could provide the springboard for future expansion, either through incremental capacity building or new lines. In either case the expansion would be based on the newer, more efficient process. It would, however, mean surrendering significant market share in the shorter term.

Model analysis suggested that industry over-capacity would persist, maintaining downward pressure on plant utilisations and prices. Keeping both plants open would hold up the company's market position but even with some reduction in average costs would lead to a poor performing business, and longer term a possibly worsening competitive position. Ironically, shutting down one of the plants would alter the supply/demand balance sufficiently to produce increased utilisations and margins. This would enable all competitors to operate slightly more profitably, and the company itself would share in this benefit in terms of further margin.

Initial leaning was towards investing in cost reduction to attempt to maintain competitiveness and market share, but eventually the consensus view was to dispose of the older plant.

The Model as an Aid to Implementation

The role of a System Dynamics model has so far been considered in terms of aiding the planning process. In this respect its role has been to help managers understand the dynamics of their business, to resolve issues that emerge, and to quantify the effects of environmental events or their own decisions. However the model can make a contribution in a further dimension, namely in aiding the implementation process. It makes this contribution in three ways:

1) the process of decision making through consensus helps develop the commitment that the team will draw upon in the implementation phase, issues and differences being largely dealt with before their effects became evident in the real world;

2) the tools developed and utilised during strategy evaluation - causal-loop diagrams, output graphs, and possibly animations - form useful visual aids to assist the communication of strategy to managers outside the team. Indeed, simulations may be run to clarify reasoning;

3) the "shared view" may be used in conjunction with other tools to improve the human resource management and organisational design within the organisation in line with the demands of the new strategies.

Expanding particularly the last point, this benefit can be achieved through the following mechanisms:

- Human Resource Management

  Specification of new staff can become a function of:

  - Sympathy with the shared view
  - Potential contribution to refining/expanding the shared view

  The existence of the model, with associated diagrams and graphs, can assist in articulating the existing view to new managers and provides a mechanism for their further knowledge and information to be incorporated

  The 'shared view' would sharpen the position of managers out of step with the rest of the team

- Management Development

  Focus moves towards the needs of the individual in terms of appreciating the shared view and ability to contribute effectively to its objectives, rather than correcting "deficiencies":

-- Expanding individual knowledge base regarding other company functions
-- Improve abilities to access and use information and data
-- Increase understanding of market forces and buyer behaviour
-- Develop awareness of forces within the the economic and socio-political environment

- Organisational Design:

A continual process of internal scanning takes place as the shared view is being developed, whereby the potential role and contribution of each function is clarified. Deficiencies in the organisation are highlighted:

- involvement of the right people
- weakness of particular functions, e.g. market /economic intelligence, information systems
- integration and communications between functions
- structures inappropriate for the new strategies

Conclusions

The value of the *System Dynamics* approach as an aid to learning and understanding has been long recognised. This paper has demonstrated its particular value in helping members of management teams to come to a consensus view when facing key strategic decisions. The two cases briefly described illustrated typical situations where the different perceptions or "views" of the business held by different team members, lead them initially to propose quite different strategies. The process of building a *System Dynamics* models, in each case ostensibly as a forecasting and evaluation tool, enabled the managers eventually to develop a "shared view" which formed the basis on which to formulate and agree a strategy.

The value of this approach was further considered in terms of the role of the model and the shared view it encapsulates in the implementation phase of strategy management, pointing to the beneficial role it can play in human resource management, including management development, and in organisational design.

This paper has thus used examples based on two consulting assignments to demonstrate the value of the *System Dynamics* approach in both the *hard* sense of providing forecasts and an objective framework for quantitative evaluations, and the *soft* sense in terms of building consensus in the management team.

Reference

Winch, G.W., 1989 "Tomorrow,Today: System Dynamics or Expert Systems", in *Computer-based Management of Complex Systems* ed Milling, P. & Zahn, E., Springer-Verlag,