Development and Implementation of a Hierarchical Computer Aided Company Planning System

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A hierarchically linked suite of business models, each constructed locally by different users, with different objectives, was developed to assist company wide financial planning. The system is self-documenting and maintaining, evolutionary and robust against partial completion. Implementation in ICI Australia progressed through a heuristically guided user participation program.

BACKGROUND

ICI Australia comprises six semi-autonomous operating groups, each an independent profit centre, but relying on the corporation for financial co-ordination and control. Company planning is a cyclical process, the frequency depending generally on the level of the planning unit in the hierarchy.

CONCEPT

Top down and bottom up corporate models are in vogue, but cannot cope with the information and decision variety in a multi-echelon system. Temptation into incorporating an ever increasing amount of detail results in an unmanageable monolithic esoteric model, breeding ill-feeling and suspicion. The ‘total system’ syndrome invariably disregards cybernetic advice and forced implementation is unsuccessful or cuts vital information channels, threatening its host with rigor mortis. Even with the advent of ultra intelligent machines, control of complex systems must still be achieved through an amplification of controller variety which means a decentralisation of decision making.

The computer assisted planning system recognised the intricate nature of the existing planning function and embedded itself in it, so as to retain the control mechanisms and pathways which could not be enhanced immediately or for which technology was unavailable at the time.

The system is composed of cellular modules called models. Each model is built by the user himself to meet his local planning requirements. Besides creating his own local data base, input and output of information by his model may be communicated to other users through a common interface file. A network of communication springs up, following company planning requirements. The models themselves consist of English like macro statements which non-experts can quickly master. Models tend to be ones
answer 'what if' type questions, allowing a rapid look at more alternative strategies. The scarce resource of planners' time is shifted from the manual preparation of 'the plan' to thinking about the future of the business.

The decentralised design makes the planner the creator and owner of his model. Maintenance and documentation can be left to his needs, being the person in the best position to make adaptive changes. Usually the only constraint is that he must provide certain information to the next higher level.

This concept is recursive, as often a group model consists of a hierarchy of models along divisional boundaries. The system is incremental in that implementation can start with any part. This robustness also implies that if one group, say, does not have a working model, it need only supply the interface file manually and the corporate level can proceed unhampered.

IMPLEMENTATION

Implementation was guided by the OR section within ICI Australia. The planning subsystem was embedded in the total organisation involving many individuals. Such systems are renowned for their capacity to generate a high variety with which implementation programs must cope. Two devices provided the requisite variety for effective control:

(a) amplification of the implementation effort;
(b) heuristic development guidelines.

The OR team tried to inspire users of the system to take the initiative in model development and participate in the project. Development of the models has been carried out using a row column oriented financial planning package on one of the commercial time-sharing computer bureaux. Given a limited amount of training, the staff concerned were capable of writing their own models, except in areas of particular complexity. A subset of the package was defined and one day workshops organised to train them in the use of the computer package and how to build their own models. The metasystematic role of the OR team was a training and advisory one.

It is not possible to specify the end detail of the total planning system. The reasons for this are clear. The system is continually being modified, adapted and evolved to match the changing needs of the individuals and the company. It is therefore necessary to understand the implementation as having heuristic rather than algorithmic development guidelines. These guidelines translate the basic concepts into the users’ language, but leaves the detail to them.

CONCLUSIONS

Some companies are burdened with the overheads of rigid appended information systems. Using the science of cybernetics, prescribing and embedding information systems, which are in harmony with the organisation, can be achieved at strategic levels.