Organizational Learning: A New Challenge for System Dynamics

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Introduction

The subject of how organizations learn and how organizational learning can be enhanced and accelerated is becoming a major interest in the business world. In the movement to reinvigorate American manufacturing, organizational learning has emerged as a major theme. In Hays, Wheelwright and Clark's recent book Dynamic Manufacturing: Creating the Learning Organization, (Hays, R. H., Wheelwright, S. C. Clark, K. B., 1988) the authors conclude:

> "There is one common denominator in high-performance plants: an ability to learn -to achieve sustained improvement in performance over a long period of time. When assessing a manufacturing organization, learning is the bottom line."

Echoing a similar theme, Ray Stata, the CEO of a successful semiconductor firm sees accelerating organizational learning as the central thrust of his efforts to make his firm more competitive:

> "I would argue that the rate at which individuals and organizations learn may become the only sustainable competitive advantage, especially in knowledge- intensive industries." (Stata, R., 1989).

Reflecting on a career in management and as coordinator of planning for the Royal-Dutch Shell group of companies, Arie de Geus, observes that an organization's ability to survive over an extended period depends on "institutional learning, which is the process whereby management teams change their shared mental models of their company, their markets, and their competitors. For this reason, we think of planning as learning, and of corporate planning as institutional learning." (deGeus, A.P., 1988).

Relatively few system dynamicists have addressed the challenges of *organizational learning* to date yet, several developments in recent years have set the stage for system dynamics to make a potentially significant contribution to this exciting new field. In particular, there has been steadily increasing attention on involving managers more directly in the modeling process, starting with the work on implementation of Roberts (Roberts, E. B.) and Weil, (Weil, H. B.) and building in recent years through the introduction of new computer software that enable managers to participate more readily in modeling, (Richmond, B., 1987 and Senge, P. M., forthcoming). In addition, there has been increased understanding of how prevailing mental models influence strategy and policy design. Morecroft suggests that, in policymakers' "debate and dialogue" over critical issues, they bring into play their "own knowledge (or mental models) of the business or social system they manage," (Morecroft, J. D. W., 1988). He proposes that the logical use of system dynamics is to develop "microworlds" to enhance the quality of this debate and dialogue and thereby improve strategy and policy.

As a result of these and related developments, I believe system dynamics could make a significant contribution to the emerging field of organizational learning. This paper attempts to illustrate the nature of that contribution and to discuss some of the new issues and challenges which must be faced if this potential contribution is to be realized.

An Illustration: The Claims Management Learning Laboratory

Over the past several years, we have experimented with a variety of approaches toward developing systems thinking in organizations. One strategy that is emerging as especially effective is the development of **learning laboratories**: integrated processes of reflection, conceptualization, simulation, and decision-making games focused on particular strategic issues.

One successful ongoing learning laboratory was developed for a leading property and liability insurance company in the US. The Claims Learning Laboratory (CLL) addresses the runaway costs that threaten the entire liability insurance industry in the U.S.\and the present reactions to this crisis[1]. Actions being taken within the insurance industry to the crisis -- beefing up legal staffs, intensifying political lobbying efforts, cutting cost -- are low leverage. They are rooted in a mindset which sees the fundamental causes of the crisis as outside management control (increasing numbers of lawyers, erosion of societal ethics and outmoded legal statutes). From a systems perspective, it appears that significant potential influence over rising costs lies within management control. But, achieving the potential leverage from new policies will require reversing long-term trends within the industry. These trends include eroding quality of insurance adjusting, low morale and high turnover among adjusters, and decay in stature and professional attractiveness of the adjusting function. Reversing these trends is unlikely without fundamental changes in prevailing mental models.

These conclusions were arrived at after a year-long study of interactions between workload management, adjuster capacity (skills and people), quality, and costs, conducted with a group of top managers of the claims function in the target firm, (Senge, P. M., forthcoming). Some of the key insights that emerged from this study were:

1. Traditional performance criteria emphasize controlling backlogs of unsettled claims and related "production measures" because these measures are more tangible and easily measured than quality of investigation and negotiation, and customer satisfaction.
2. When there is time pressure from more work to do than can be completed by present adjusters at present quality standards, several responses are possible:
    - maintain standards and let backlogs build
    - add adjuster capacity

[1]For example, Premiums on auto insurance in the U.S. doubled from 1983-1988, and medical malpractice rates increased even faster. Lying behind these increased prices of insurance coverage is an explosion in litigation and settlement costs.

- lower standards and get the work done

3. Given managerial pressures to control backlogs and given delays in building adjuster capacity, lowering standards is often the easiest way to relieve time pressure
4. Once time pressure is relieved, so are the signals that more capacity is needed.
5. Over the long term, settlement and litigation costs increase steadily due to poor investigation and negotiation of claims, eroding quality standards mask undercapacity, and financial pressures make adequate investment to build adjuster capacity near impossible, even if it were perceived as necessary.

The CLL was developed to stimulate rethinking throughout the entire claims organization. In the 3-day introductory CLL workshop, groups of 10-15 managers discuss their current strategies and difficulties, conceptualize interactions in the claims system, and execute a variety of scenarios using a decision-making game based on a system dynamics model developed in the original study. There is a strong emphasis on developing managers' abilities to conceptualize and communicate about the complex challenges they face.

The CLL has now been in operation for more than a year. Almost all claims managers, and a surprising number of managers from other functional areas, have attended the introductory workshop. We are now in the process of designing next stages of the CLL and studying the effects within the claims organization. Reactions to the introductory workshop have been almost universally positive, with many managers claiming it to be their most meaningful training experience. Even more importantly, the workshop seems to be developing the rudiments of new, shared mental models. Managers are beginning to develop a language for discussing interactions between workload management, quality, and costs. This is leading to new insights and making understandings that were previously grasped only intuitively clear and discussable. Experiments with new policies and strategies are beginning. Although it is too early to judge the long-term effects on the core issues of runaway costs, a shift in the assumption that these problems are generated externally seems to be occurring. As one recent participant in the workshop stated, "It is clear that the reality we presently have (escalating costs, high turnover of adjusters, low morale) is only one of several possible realities."

New Issues and Challenges for System Dynamics

Models for Learning Rather than Convincing The CLL was developed at about the point where traditional system dynamics studies would end. After working for a year with the vice president and a team of senior managers, a system dynamics model had been developed with which there was high confidence. The technical model builders felt that the model captured the causes of a set of important dynamics. The manager-clients had been intimately involved in conceptualizing and analyzing the model and placed a high level of confidence in its policy implications. The managers were able to articulate those

policy implications with conviction and clarity. A traditional consulting project might have ended at that point with high confidence of "implementation."

Yet, that confidence would have been misplaced. In fact, the results of the model were virtually unimplementable. The model suggested a need for increasing investment in adjuster capacity (increased skill levels, higher remuneration and stature, more people) at a time when the firm, and the entire industry, is under intense financial pressure to cut costs. Moreover, the model implied that established policies had produced declining quality, underinvestment in capacity, and increasing settlement size -- exactly opposite the organization's espoused policies of high quality standards and aggressive building of adjuster capacity,[1]. The gap between what was espoused and the contradictory consequences of established management practices was virtually undiscussable in the organization. To tell people that we had built a model which showed that their actions were producing the opposite consequences of what they believed was a sure-fire way to undercut whatever credibility and possible impact the model might have.

In such a situation where a simulation model reveals fundamental inconsistencies and contradictions in established operating policies, the only possible strategy, in my judgement, is to create an organizational learning process. It is simply not possible for someone who has gone through an intense learning process to expect someone else to agree with the conclusions arrived at from that learning process. Even if that person is "the boss." If, as is increasingly the case in modern corporations, decision-making is widely distributed throughout the organization, there are hundreds of individuals who "implement" new policies. For significantly new policies to come into practice, each person must go through their own personal learning process. There is no substitute.

This has significant implications for system dynamics. In the traditional system dynamics process, most of the learning goes on in the modeling process. Those involved are the model builders and, perhaps, a small number of clients who become involved in developing and testing the models. Once this group comes to some stage of completion, they arrive at recommendations, which they attempt to transmit to the larger organization. At this point, the model(s) becomes a tool for convincing people rather than a learning tool. But, as I have argued above, the more radical the shift in policy required, the less likely is this convincing process to be successful.

There is much to be learned regarding the design of learning processes whereby large numbers of managers can develop their own insights. The essence of such learning processes is that it enables people to develop their own insights rather than leading (no matter how cleverly) people to a predetermined set of answers. For me, designing such a learning process required a shift in perspective about the purpose of the model we had worked long and hard to develop (see Chart below; originally developed by William Isaacs).

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[1] In point of fact, in the preceeding years the firm had expanded adjuster head count almost 30% per year, and the firm has a larger number of adjusters per claims volume than the industry average. We believe these data are misleading because expenditures on adjusters does not produce adaequate adjuster capacity due to high turnover, and comparisons to industry norms are misleading because the entire industry appears to have significant undercapacity.

Uses of Models for

Convincing	Learning
• prove a point	• promote inquiry into "whys"
• answer is predetermined	• challenge predisposition
• convince people of the need for particular changes	• encourage open testing
	• increase practical experimentation
• keep assumptions hidden	
	• develop internal commitment to objectivity
• act like an oracle	
	• experience "system as cause" of behavior

Elements of Effective Learning Laboratory Design

To date, the lessons that stand out from experience with successful learning labs are:

1. The importance of conceptualization
2. Designing in reflection
3. Beware the computer

Conceptualization. In the Claims Learning Laboratory, more than a day of the first day and one-half is spent in a series of conceptualizing exercises. The managers are asked basic questions like, "What are the determinants of adjuster productivity?" and "What influences quality of investigation?" to help them identify basic interdependencies. Through this series of exercises they gradually build up a causal map of the major feedback processes included in the model with which they will eventually interact. This not only familiarizes them with the notions of reinforcing (positive) and balancing (negative) feedback, but brings them to a point where the model with which they will be interacting is no longer a black box. In fact, one of the most significant accomplishments of the learning lab is that virtually none of the managers question the basic validity of the model in the sense of challenging the basic interrelationships. Why? Because, through the conceptualizing exercises, they have already identified those interrelationships as important in the claims system. They feel like the model is *their* model.

Reflection. Having an intriguing, relevant decision-making simulation does not guarantee learning. In fact, the more "user friendly" the software, the more likely it is to invoke what we have since come to call this phenomenon the "video game" phenomenon. The video-game phenomenon occurs when managers play a game to optimize their score, with little thought as to why certain strategies are more

successful than others. If the dynamics of the game are subtle -- that is, not transparently obvious to the player -- it becomes still more likely that they will play to win rather than play to learn.

To compensate for the tendencies of managers to undermine their own learning, we are developing simple "learning scenarios." The learning scenarios are simple, narrowly focused exercises to achieve very particular objectives, such as control the backlog of unsettled claims, or try to improve quality. What is important about the learning scenarios is that they serve to develop disciplined strategic analysis. The players (who work in teams of two or three) must:

- state their strategy and what they expect to happen to certain key variables
- then, after their play, compare actual results achieved to what they expected and reason out any discrepancies. The results of this analysis are then presented to the group.

This process of reflecting on gaps between what happens and what was expected and reasoning through why such gaps occur establishes a discipline that the managers then carry forward to all their subsequent experiments with new strategies. Without such a discipline, game playing can easily become pure entertainment rather than real learning.

The Computer. The participants in the Claims Learning Lab spend the first day and one half without seeing the computer. The reason for not introducing the computer sooner is that few managers view computers as tools for their personal learning. Most managers see computers as tools for analyzing large amounts of data and for making prediction. In a successful learning process, it is very important that managers perceive that the process is about them, their ways of thinking, their strategies, their problems -- not about the computer. Thus, it is very important to not introduce the computer before the real purpose of the learning is understood. It appears that many professional system dynamicists fail to appreciate this point.

Behavioral Dynamics in Group Learning

Often learning fails to occur because of the dynamics of the team that needs to learn. The existence of "defensive routines" and other behavioral phenomena that thwart learning is well documented,(Argyris, C.,·1988). Many a system dynamics study has failed to achieve lasting impact because of implicit rules of conduct and patterns of interaction contrary to genuine inquiry and testing, despite the presence of insightful models about important issues.

If system dynamics is to contribute to organizational learning, ways of dealing with behavioral and learning issues, as well as substantive policy and strategy, must be developed. Learning laboratories offer interesting potential in this area. A meaningful managerial simulation creates a microcosm for observing implicit learning rules and patterns of interaction among members of a team.

In one current set of experiments with the top management team of a leading durable goods company, we are exploring one method for combining decison-making games and reflection on a team's learning process. The approach utilizes a multi-person decision-making game designed to study dynamics

of the firm's new marketing strategy and to put the members of the team into their real-life decision-making roles as they carry out that strategy. The team members' interactions during plays of the game are taped and transcribed. They are then analyzed by a behavioral scientist who is part of the research team, with the objective of identifying patterns of interaction among the team members that undermine their learning. Feeding back the results to the team members has proven to be a powerful stimulus for expanding their learning.

As this work proceeds, it may illuminate significant next steps in designing learning laboratories that develop systems thinking and group learning skills.

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