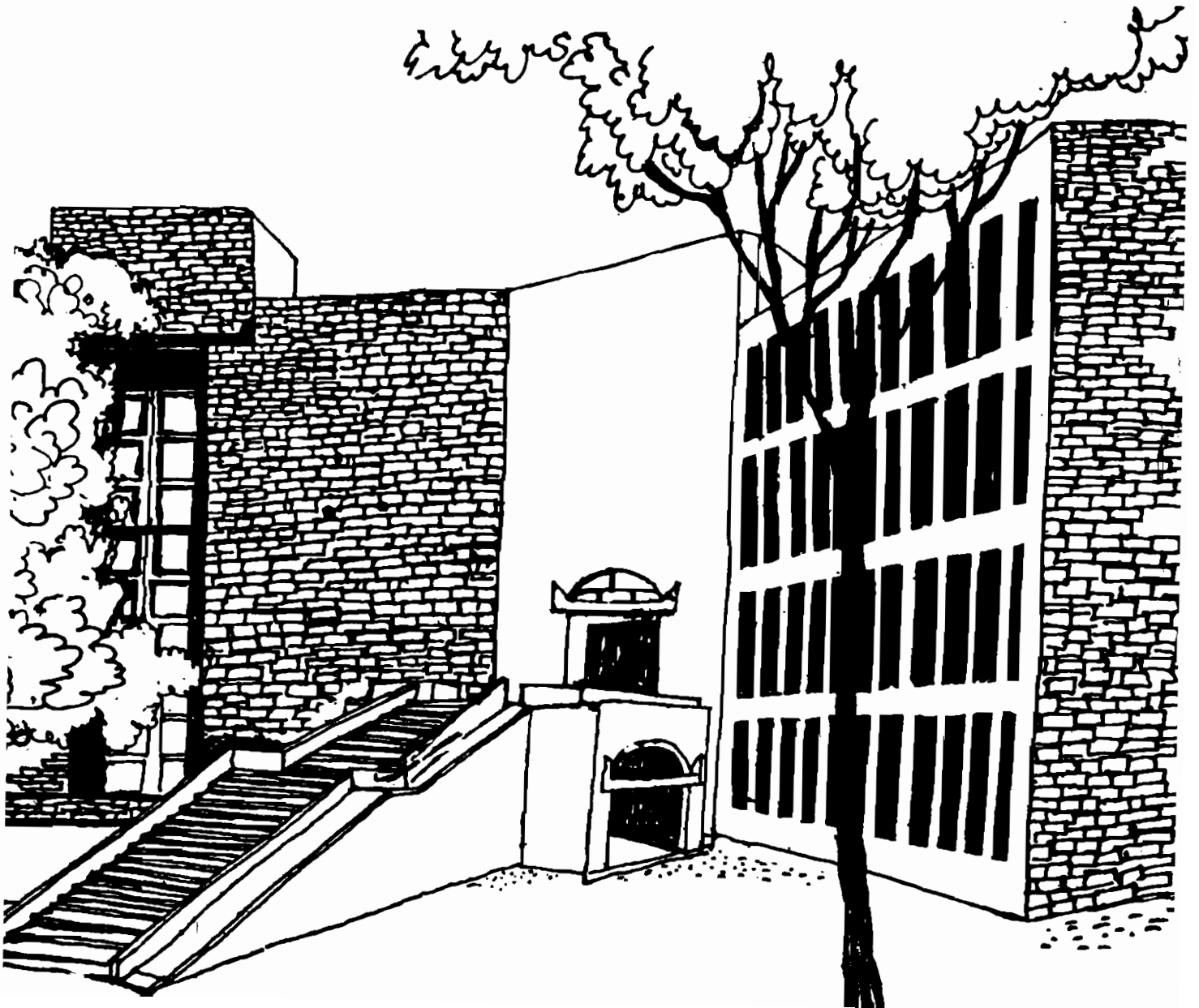




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Working Paper



**TRAPPINGS OF EXERTISE AND THE
PURSUIT OF FAILURE**

By

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WP1090



WP

1993

(1090)

W P No. 1090
March 1993

The main objective of the working paper series of the IIMA is to help faculty members to test out their research findings at the pre-publication stage.

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Abstract

In the past, people learnt about dealing with complex situations through life experiences. With the availability of computer simulations, it seems feasible to supplement 'life' as a teacher to foster learning about the challenges of complex, dynamic, and uncertain realities.

This paper describes a computer simulation of a business organization used with 20 groups of participants. Each group had three members and was expected to manage 24 months of the organization in 3 hours of simulation time. The simulation threw up some interesting behavioural patterns, and provided some insights into the typical errors in the planning and decision making behaviours of specialists. For example, it was found that despite a flood of analysis, several specialists seemed hesitant to apply yardsticks, make choices, and take stands. So there was a strong tendency to avoid or postpone action taking. It was also found that each group developed a routine for data collection. Using the metaphor of 'control panel', the paper examines how routinization channelizes the attention of the group in certain directions and away from certain areas.

Several implicit assumptions were identified which blocked the learning of groups from experience. The paper discusses the behavioural patterns reflective of the assumptions. For example, there was a strong tendency to shrink when things did not go as planned. The key concern was found to be with minimizing mistakes.

The concluding section discusses some of the self-reflective comments of the participants and the role of organizational simulation exercises for management training. An attempt has been made to explore the notion of strategic orientation as heightened awareness of the choice points that one encounters. A strategic mind develops better understanding of the functioning of complex systems, and retains its flexibility with respect to the choice points rather than getting entrenched in set behavioural patterns.

To know
That we know what we know
And that we do not know what we do not know
That is true knowledge.

--- Confucius

A top management team took over a small healthy company manufacturing garments. In the first few months, they concentrated bulk of their efforts on carefully working out production schedules, purchasing materials, and monitoring inventory levels. With new product introductions and product promotion efforts not getting much attention, the company started losing its market share.

When sales started going down, the management team tried to ensure that the company did not go in the red by slashing the expenses on advertising and developmental programmes. While the step achieved the intended goal of cost reduction, there was also the unintended (and unexpected) outcome a dramatic fall in sales.

In a desperate attempt to keep the unit afloat, the management team retrenched some of its workers and supervisors. The morale of the employees, already quite low, now hit the rock bottom. Product quality deteriorated, and key workers and supervisors resigned. The bankers stopped lending, and getting funds for working capital became difficult. The company limped along for some time, and then was forced to shut its operations.

The problems faced by the top management group in the above company are likely to strike a familiar chord with people who have, at one point of time or another, grappled with problems which have refused to behave as per the models implicit in their minds. While they may believe (at least initially) that they have understood the nature of the problem quite well, they are forced to confront the disconcerting situation of their solutions not working and even the evidence that their "medicines" are only confounding the issues further and pushing the organization deeper into difficulties. Such situations raise an important question: how does one cognitively deal with problems that defy one's seemingly rational framework of analysis and decision making ?

It is to explore this question that a study was done involving twenty groups of participants in a management programme, who "ran" a company on computer through an organizational simulation. Each decision making group consisted of three members who had completed all the basic courses in different management disciplines. In the computer simulation game (sometimes referred to as microworld), they were expected to function as the top management group of "Manutex", a garment manufacturing company and take decisions over a two-year time period of the company (which they were required to complete in three hours of simulation time). Their behaviour during the three-hour simulation (which included the number and types of questions asked by the group members, the issues discussed amongst themselves, and nature of decisions taken) provided a rich source of data on how group members dealt with uncertainty and complexity.

Manutex Simulation : A Brief Description

When each group of three participants came to the class room for the simulation game, they were given an introductory note which informed them that they had unexpectedly inherited Manutex from a distant uncle who had died recently. Three months had elapsed since then, and they were in charge of running the company. As the top management group, they would make decisions through discussions and deliberations among themselves. The introductory note provided significant details of the company such as manufacturing facilities, employees, stock levels of raw materials and finished goods, volumes of production, sales, and purchases during the previous three months, and so on. The note informed the participants that they could seek further data from the facilitator and then make decisions for the company for each month. They had to communicate these decisions to the facilitator so that these could be "implemented" on the computer.

It was made clear to the participants that the facilitator was neither an advisor nor a secretary to the management team. He simply performed the role of facilitating the participants' interface with the Manutex simulation running on the computer. He would answer the participants' questions by referring to the computer database and enter the decisions made by them for each month. After receiving the participants' communication that they have completed their decisions for the month, he would close the month by implementing their decisions on the computer. At the start of each month, he would be able to respond to the participants' questions on business results for the previous month such as sales achieved, production, materials, finance, personnel, and competition.

The participants were informed that Manutex was located in Kuala Lumpur, Malaysia. This was an unfamiliar location for the Indian participants, and so they could not assume that a set of routines learnt earlier would work in this new setting. Information on important governmental regulations, tax structure etc. were given to the participants. But the problem was novel and unstructured for the group members.

The simulation was also quite complex with a variety of factors such as product quality, price, promotion, management of inventories of raw materials and finished goods, manufacturing practices, financial aspects, employee satisfaction and morale, and new product introduction having an impact on the final performance. As in the real world, these factors did not remain static over a time period.

The group had to operate under a fair degree of time pressure. They were expected to complete the 24 monthly cycles in three hours, making decisions with respect to manufacturing, marketing, materials, financial, personnel, and administrative areas. The group was free to allocate the three hours among the 24 months of the company in a way that best suited them. Typically, the groups took more time for the initial months, and then moved more rapidly as they understood the functioning of some of the key parameters.

When the participants "inherited" Manutex organization on the first day of January, the company had one million Malaysian dollars in the bank, and some stock of finished goods and raw materials. There was an organization of 37 employees who had worked with the founder for quite some time.

The participants could seek data on a variety of aspects, such as the demand for the products, competitors' prices, raw material requirements, raw material prices, production volumes and sales volumes achieved, inventories of raw materials and finished goods, quality levels, staffing pattern, satisfaction level of employees, work load, condition of the machinery, incomes and expenditures under different heads, etc. They could take decisions with respect to a number of areas, including purchasing raw materials, fixing production targets, introducing new lines, buying new machinery, hiring and firing employees at different levels and for different departments, changing salary levels,

fixing prices for the different lines, allowing trade discounts, and deciding on the funds to be spent on advertising and product promotion, maintenance, or labour welfare.

As the participants took decisions, the business results in the different areas were updated by the computer programme. As mentioned earlier, the members had access to whatever information they wanted on the results of the previous month, so that they could appropriately adjust their actions. The simulation also had the facility to retrieve data from earlier months or obtain cumulative results. But the group had to make a specific demand for information, decide on specific actions to be taken, and communicate to the facilitator when they were ready to move on to the next month.

The simulation had, of course, certain limitations. For example, it assumed that there were no differences among employees in terms of performance. It was, therefore, not possible to give special increments to high performers. Within a certain product line, it was also not possible to create variety to cater to the different price and fashion segments. If the participants sought to intervene in such areas (which happened very rarely), they were informed that it was not possible to implement their decisions.

Objectives of the Simulation

The Manutex simulation has been developed by Professor Dietrich Doerner and his associates at the University of Bamberg to study the nature of the thinking process. As must be evident from the description of the simulation, the game presents individuals with a complex problem, many elements of which are not transparent. In other words, the structure of the problem is unknown and so the participants have to unearth the intrinsic nature of the problem by interacting with it. While analysis and planning can provide useful insights to participants, they cannot entirely substitute "learning by doing". The simulation helps us examine the extent to which the participants dive into the problem and muddle their way through, or the extent to which they follow a more analytical approach.

When participants initiate behaviour on the basis of their implicit mental model, they may discover that some aspects of their thinking may get validated, and their understanding of the underlying rule structure may get progressively enlarged. The relative success in dealing effectively with the unstructured problem is influenced by a variety of factors such as the willingness of the participants to engage in active inquiry, their risk taking behaviour, their ability to maintain an objective and critical stance towards their own suppositions, and their ability to reflect on their actions to keep their thinking flexible.

Thus the organizational simulation helps us explore a number of important questions relating to dealing with uncertainty and complexity. The questions cover two broad areas : the way people approach the problem at a strategic and at an operational level, and how the approaches are affected by factors such as time pressure, stress, and group processes :

- How do individuals plan their larger goals ? How much are these driven by certain values ? To what extent does the planning process degenerate to merely fixing operational targets ?
- When individuals develop plans and strategies, how much do they appreciate the role of side effects which may occur over a period of time, and how well do they deal with them ?
- How do individuals obtain information about an unknown sphere of reality ?

- How do individuals cognitively map the unfamiliar territory of the problem ? In other words, what processes do they follow to understand the key elements of the unstructured problem and their interlinkages ?
- How well do individuals differentiate between facts and opinions or assumptions ?
- How do individuals deal with discrepancies between their suppositions and reality ?
- How are processes of mapping and goal setting affected by time pressure and stress ?
- How much do individuals build expectations about the future ? To what extent do they develop suppositions and hypotheses?
- How do changes in strategies occur ? Under what conditions do they change ?
- How keen are individuals to obtain feedback on their own actions ? How much do they monitor the effects of their actions so that they can modify these appropriately ?

When we examine case studies of organizational crisis, we find that the central problem often relates to the way key decision makers have wrongly conceptualized the issues -- for example, the tendency to focus on immediate goals at the expense of long term strengths, the tendency to focus on a part of the organization rather than taking a view of the organization as a total system of interdependent elements (in other words, seeing the trees but missing the forest), inability to question one's beliefs, inability to perceive one's own role in creating some of the most vexing problems, and so on. The simulation helps us inquire into these areas by providing a rich sample of behaviour patterns.

Some Generic Behaviour Patterns

Experience is inevitable; learning is not.

-- Russo and Schoemaker

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As noted above, the Manutex simulation was done with twenty groups of participants who had completed all the basic courses in management. Initially these participants felt that they understood the problem quite well, and even had a certain degree of expertise in solving such management problems. It could be observed that they felt highly involved. Once the company data were obtained in the initial months, computations were made at a furious speed to develop alternatives. There were agitated arguments and hushed evaluation of results among participants. Their spirits rose with the rise of their bank balances; the decibel level went up markedly when participants experienced a sense of personal efficacy and mastery. But when the company performance nosedived, a sense of gloom descended. There were bouts of nervous laughter, some got angry, and some participants became very quiet and seemed to have emotionally withdrawn.

In spite of their "specialization" in the field of management and their emotional involvement in the game, only two of the twenty groups had profits to show at the end of the two years of Manutex. Ninety per cent of the groups lost money, some to a small extent and some to a very large extent. What went wrong with the specialists ?

Actions in a Trickle despite a Flood of Analysis

After reading the introductory note on Manutex, several group members felt that there were aspects of the situation that they were familiar with. The members started working quickly in the known areas.

For example, faced with data on machine capacities, inventories of raw materials, and levels of production and sales, the participants got down to computing how many months' stock of raw materials and finished goods the company was carrying. A few groups tried to get a balance sheet prepared for the company. Since a substantial amount of data was available, the groups took considerable time in the initial computation.

The detailed calculations created two kinds of problems for the group members. Firstly, it created time pressures for the latter months as the groups had to operate within certain overall time constraints. Secondly, it prevented the groups from getting to the right level of abstraction, which was neither ad hoc nor exact. For example, the members were required to buy thread which cost M\$.01 per roll. Some groups did not go below the thousandth digit in working out the purchase figures, so that they could concentrate on more important aspects. But the groups in the "computation mode" almost assumed that they were fully aware of the structure of the entire problem and the cause-effect relationships, and so wasted precious time working out the exact number of rolls required every month.

Many members did not raise questions about contextual factors such as the industry characteristics, market situation, demand levels, lead times for obtaining materials, etc., and so did not have a framework to make effective use of the data. But this did not stop some groups from applying the management techniques that they knew well; the computation of the optimum inventory levels, just-in-time concepts, etc.

Manutex had been headless for three months following the uncle's death, and so sales of garments were low for the previous three months. Most participants who had made detailed calculations were strongly influenced by this setback in the immediate past, and decided to initiate a series of conservative measures such as suspending production and purchases of raw materials. Some groups decided to even sell some of the machinery (which they had calculated as "excess capacity") or fire the "surplus" workers. Some groups addressed the marketing issues, but tended to be conservative. For example, when a group member proposed that the advertising expenses were way below reasonable advertising norms and that there should be an increase of the advertising budget from M\$ 3000 to M\$6000 (the group had about M\$ 1 million in the bank, and a monthly sales of about M\$ 150,000), the other two group members responded by saying that such a "gamble which involved doubling the promotion expenses" was uncalled for, and so the budget went up just by M\$ 1000.

When the cutting down operation was not accompanied by an active programme to produce and market goods, the unit tended to go down further. Having shrunk and created a failure syndrome, most groups found it even more difficult to take risks, initiate actions, and put the company back on rails.

The highest energy level among the members was found during the analysis stage. The analysis work seemed to give the group members a sense of competence and a feeling of being in control. But in the absence of a broader understanding of the context when the analysis did not pay off, there seemed to be very little energy left to develop a new programme of action which would address the real issues. The group members felt derailed by the negative feedback, and reduced actions to homeopathic doses.

Ability to analyse the problem was an area of perceived competence for the group members. But action-taking also required applying yardsticks, making choices, and taking stands. There was a strong tendency to avoid or postpone these aspects.

Lack of Awareness of Issues Not on one's "Control Panel"

We observed that every group had developed a fairly unique routine by the second or third month. At the end of each month, one group may ask for sales figures and the bank balance; the other may check

the competitor's prices and demand levels; the third may want a detailed break-up of income and expenses. Some groups included information relating to raw material stocks, raw material prices, condition of the machinery, and so on, as they went into latter months. Interestingly, information regarding satisfaction levels and morale of employees was ignored by most groups. Once the routine was developed, information was collected consistently even if it was never used. For example, a group regularly sought the competitor's prices, but did not alter its own prices even once.

One may use the metaphor of "control panel" to capture the behaviour of groups with respect to collection of data about the organization. Each dial on the panel provides signals from the system about developments in a given area. The control panel serves a useful function by introducing a degree of routinization with respect to keeping track of different aspects. Thus the group is able to monitor information in a number of areas quickly. It is, however, important to note that the control panel that each group develops for itself influences not only what the group consistently pays attention to but also what it consistently ignores.

The groups were, however, rarely aware of the fact that, while they were systematically monitoring certain aspects, they were also systematically ignoring certain other aspects. For example, when a group did not have "dials" for the condition of the machinery, satisfaction level of people, price of raw material, and competitor's prices, they remained unaware of the developments in these areas.

Attention is a scarce resource. When things go wrong, the groups tend to merely adjust the factors on the control panel, because these are the only factors in their attention span. They remain unaware that their difficulties arise from changes in factors that they are not even looking at. When their solutions and actions do not work, the members get frustrated, blame the system as irrational, or emotionally withdraw. It is rarely that groups raise some basic questions about the nature of issues that they have been monitoring and the kinds of issues that they have not been keeping track of. They get so preoccupied with the control panel that they lose the ability to look in other directions to get an overall feel for the problem.

We noticed that crises tended to modify the nature of control panel. For example, when a group found out that the production had fallen substantially because of the poor condition of the machinery, it added the item relating to machine maintenance on the control panel. When inquiry revealed that the problem of high turnover of people arose from low morale of employees, employee satisfaction was included as an item for monitoring. Thus groups which experimented actively tended to acquire greater learnings. They were, thus, able to upgrade their control panel and develop a better appreciation of the key parameters influencing the system. But the groups which remained unaware that they were working with an incomplete and poorly designed control panel remained perplexed and baffled about the functioning of their organizations.

Some Assumptions which Block Learning from Experience

The behaviour of the groups suggests that certain assumptions are at play in consistently pushing the groups in specific directions. Some assumptions blocked the groups from developing a more complex mental map of the organization, and prevented them from dealing effectively with the uncertainty. Such assumptions which hindered learning are discussed below.

Goal setting involves extrapolation of trends : The groups which were guided by this assumption based their actions more on performance trends in the immediate past than on a clear understanding of the functioning of the organizational system. For example, one group had achieved sales of 8000 shirts per month at one point of time. This had dropped to 60 over the next six months owing to a series of wrong steps taken by the group. When a group member who asked for the information on

stocks of shirts was informed that there was an inventory of 700 shirts, he suggested to other members that there was no need to produce any more shirts, as the company had "twelve months' stock". His view was not contested by the other members, who also did not realize that the low level of stocks was one of the factors which was pushing down the sales. The performance trend in the immediate past was so powerful that the members were unable to see that, at their earlier level of performance, 700 shirts represented less than three days' sales, and not twelve months stock as was perceived by the group. Groups which were under the spell of this assumption settled down to an unthinking routine of goal setting, which merely relied on extrapolation of performance trends.

Performance figures capture all the reality : Some groups were foxed by the system because they placed undue reliance on numbers. In the absence of a broader understanding of the context, the numbers gave them a distorted view of the organization. For example, groups which were guided only by the performance figures pertaining to the three months following the uncle's death, were less likely to be patient with the organization that was coping with the loss of its founder. In several cases, impatience with dipping performance figures was translated into steps that pushed the organization deeper into a crisis.

The numbers-oriented groups were also less likely to perceive that time lags led to delays in procuring materials, getting finished goods into stores, and initiating action. When things did not work out, the group members were more likely to blame the Manutex workers and supervisors for "taking things easy".

The numbers orientation also seemed to hinder the group members from visualizing the organization and its requirements. For example, some group members reported at the end of the simulation that they had not visualized the sales outlets, the requirements of the customers, the expectations of the employees etc., and so had harboured a myopic view of the organization. Like following a religious ritual whose original significance had been lost in the mists of history, the members wedded to this assumption kept track of all performance figures meticulously and concentrated on them closely hoping that insights would pop out of the numbers.

Shrink, if things don't go as planned : Groups with excessive efficiency orientation were unable to take the right risks. It was usually possible to identify the excessively conservative groups by the nature of dominant sentiments in the initial stages. They tended to view any slack as waste, and were more interested in cutting down surplus labour, machinery, and inventories, than attempting to develop proactive strategies for utilization of existing resources.

When things did not go as planned, they implicitly assumed that it was caused by a hostile environment. These groups, therefore, moved to shrink the operations and minimize the damages instead of attempting to diagnose the problems. Having shrunk, they became a smaller operation with reduced capabilities to make a dent in the market place. This forced them to shrink further. Thus the groups were caught in a vicious cycle, and became victims of their own logic.

Stick consistently to initial plans, even if they are not working: Some groups saw planning as largely a one-time activity. In the first round, these groups invested considerable time, energy, and effort in developing certain action plans. When discomfiting signals emanated from the system, which suggested that the impact of their actions was far from satisfactory, they disregarded the negative information and persisted with the control of the same set of variables. The group members seemed to have such high stakes and had invested so much time in the plans that they avoided raising basic questions about the direction of their efforts.

The groups, therefore, became inflexible. They continued their calculations using the same framework. Over a period of time, they grew increasingly listless and decenergized. The goal-setting process became more of a ritual. As the plans and computations gradually got discredited, the groups drifted to ad hoc decision making, thus giving up all attempts to come to terms with the problems they faced.

When there is poor performance, blame "them" : When the initial conceptual frameworks created by the groups to plan their actions did not yield good results, some groups were found to be more interested in criticizing the larger system than trying to find out what may be inadequate about their own approaches. They saw their own framework as quite rational, and felt that either the organization was behaving irrationally, or that the facilitator was giving the wrong numbers and misleading the group, or that the simulation was defective or their "subordinates in Manutex" were incompetent. A few groups delegated certain matters to their "Manutex subordinates", because they themselves did not quite understand what was happening in the organization, and found the process of making sense of the complex problem quite tedious. But when the "subordinates" also failed to revive the company, the group members blamed them for acting in a stupid way.

One of the groups which exhibited this "blaming syndrome", however, did not hesitate to take credit for itself when things did work out as per plans. In other words, there was positive performance because the group was sagacious and took the right actions. Ineffective performance occurred because the incompetent "Manutex employees" messed up the implementation. In one of the groups, after the members had finally managed to learn the key parameters which, in turn, helped the performance of the company to improve, a member remarked : "Now we have straightened those guys (working in Manutex). They are finally performing."

Thus some members had difficulty in seeing themselves as a part of the organizational system. In other words, they failed to appreciate that Manutex may have certain unique characteristics; but the organizational character (which includes the ability of the organization to remain competitive, its innovativeness, morale of organizational members, their sense of achievement, and so on) that emerges over time is ultimately influenced by the nature of actions taken by them.

At the heart of this issue is also the question of how willing are the individuals to take personal responsibility for their action and inaction. The individuals who want to avoid assuming accountability for their acts of omission and commission are more likely to blame others for all the ills, and thus miss opportunities to learn from their mistakes.

Experimentation is too expensive : As 'learning by doing' represented an important way of discovering the factors which could contribute to success in managing Manutex, the groups had no option but to take calculated risks. The only way to understand the organization was by attempting to make it work. This required the groups to move beyond analysis and get down to action.

A few groups experimented at an early stage with trying to introduce such measures as enhanced budget for product promotion, and a change in the pricing policy. These groups were more likely to inquire, on their own, as to how employee satisfaction could be improved, what kinds of new products could be introduced, and which new markets could be explored. The spirit of experimentation helped them acquire a more complex understanding of the intrinsic nature of the organization and the industry, and yielded positive results over a period of time.

The less successful groups tended to be more reactive. They waited for certain developments to occur in the system which indicated a need for some action and then responded to the situation. It was almost as if these groups were waiting for a nod from an imaginary authority figure who could only permit the members to go outside the given framework and experiment with new measures. Their

behaviour indicated that these members had self-imposed chains, which did not allow them freedom and autonomy to think and act as managers.

The key concern should be with minimizing mistakes : In the groups, resistance to learning by doing emanated largely from the fear of making mistakes. The dominant concern was more with minimizing losses and problems than with maximizing gains from opportunities. When new ideas emerged, the group members asked each other, "How do you know this would work ?" Since there was no way members could answer such a question with a degree of certainty, many good ideas were lost to the group. As Lord Keynes pointed out, "A large proportion of our positive activities depend on spontaneous optimism rather than on mathematical expectation.... if animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but mathematical expectation, enterprise will fade and die."

In one of the low performing groups, there was greater preoccupation with the interest that could be earned from the cash-in-bank than with the income that could be generated by reviving the dipping sales figures. The group members were found more busy cutting down each other's ideas to ensure that no wrong steps were initiated, than with trying to develop a coherent plan of action.

When one is dealing with a novel and complex system, the act of reducing the possibilities of mistakes also dramatically reduces the possibilities of doing the right things which could contribute to the well-being of the organization. Thus the organization is made to pay a heavy price for an orientation that is intolerant of mistakes. As the organizational performance suffers and as it shrinks in size, the slack available to absorb mistakes also goes down. Thus a vicious cycle takes over, which pushes the organization down further.

Concluding Observations

Table 1 presents the self-reflective comments made by the participants during the debriefing session held to consolidate the learnings of the different groups from the simulation exercise. The comments indicate that the participants had developed awareness of some errors they had made in dealing with a complex decision making situation.

Experience is a powerful source of learning. But we do not normally experience the long term and systemic consequences of our decision making, in the sense that we are unable to experience the connections between our specific actions and their consequences which may unfold over a period of time. The simulation exercise is a powerful learning tool because it compresses space and time, and helps individuals experience organization as a system, where action steps which may seem highly reasonable in the short term may prove to have disastrous consequences in the long term.

The organizational simulation exercise helps individuals develop a greater appreciation of the need to think carefully about their initial model of the system, the need to test and refine the model continuously by thoughtful experimentation and open-minded analysis of outcomes, the need to be aware of the factors which may be out of sight and out of mind but which still influence the final results, and the need to balance and pursue multiple goals of the system. During the debriefing sessions, participants are able to compare and contrast their decision making approach with the approaches of other individuals and groups. This comparison throws light on the pattern of their assumptions.

Table 1

Errors in Decision Making : Self-Reflective Comments of the participants

- * Did not recognize the needs of garment industry/business.
- * Reduced stocks and did not produce sufficiently. Did not ask for demand forecasts. Assumed that the market was going down.
- * Made the mistake of transplanting ideas (just-in-time concepts) without understanding the nature of the business.
- * Fired the workers without much thought. Did not understand the need for supervisors. Completely ignored the personnel aspects.
- * Did not look beyond the three items that we were producing. Did not realize that we could add new products.
- * When things did not work out, just gave up, simply waiting for the simulation to get over and put an end to our miseries.
- * When things got into a mess, we told each other self-deceiving lies so that we did not have to make any personal changes.
- * To minimize negative feedback, we chose to operate three months at a time.
- * Ignored maintenance of machines. Did not have the stocks to tide over the production loss, and got into a crisis.
- * Did not bother about people in the organization, their needs and aspirations.
- * Did not check whether our decisions were implemented. Assumed that the remote control was working. Later realized that we were pressing the buttons, but nothing was happening to the system because our administrative system had become totally demotivated due to our personnel policies.
- * Did not think big.
- * Most of the time, we were in a reactive mode. At no point of time did we discuss what we wanted to achieve in the two years.
- * Went downhill after a few average months. At that stage, things became too complex and we just gave up.
- * We felt we should take some risks. But we did not try hard enough to convince the partners.
- * No long-term orientation. There was a lot of functional bias.
- * Each member took a role -- I took up purchase, finance and administration; the other two took up marketing and production. We got so preoccupied with our individual roles that no one paid attention to the overall organization.
- * There was not much reflection and thinking in our group. We were operating mechanically.
- * We felt that the concern with higher order issues like development could wait till we had made some decent profit. Later we realized that these issues are intertwined.
- * Delegated the problem because we did not understand and were under time pressure. But this did not work out.
- * Did not visualize the sales outlets. Continued to wonder why we were not selling.
- * Got obsessed with production and ignored other aspects. Did not ask for some data because I assumed these would not be available.

Russo and Schoemaker state that good decision making requires more than knowledge of facts, concepts, and relationships; it requires metaknowledge. They define metaknowledge as involving an appreciation of what we do know and what we do not know. Metaknowledge, therefore, concerns a higher level of expertise which is related to an understanding of the nature, scope, and limits of our basic or primary knowledge.

The participants in this study were well equipped with the basic knowledge. Having completed all the basic courses in management, they could even be considered experts with respect to primary knowledge. Their failure can be traced to the lack of appreciation of the nature, scope, and limits of their expertise. The simulation exercise is particularly useful to develop this appreciation among the participants, enhance their understanding of the dynamics of the organizational system, and sensitize them to the demands of situations characterized by uncertainty and complexity.

Strategic orientation may be viewed as heightened awareness of the choice points that one encounters: for example, diving into action vs. spending more time on diagnosis and planning; conserving what one has vs. pushing new frontiers; concerning oneself with issues of today vs. taking up issues of tomorrow; trying to understand the system as a whole and seeing the interdependence and interconnections of different elements vs. focusing on the sharp details of the individual sub-components; being guided by intellect vs. being guided by emotion; learning through planning vs. learning by doing; persisting with certain steps vs. experimenting with new ideas; being serious vs. being playful; diverging and raising possibilities vs. converging and making choices or taking actions; and distancing oneself and taking an overview vs. immersing oneself in the concrete realities. A strategic mind recognizes these choices and retains its flexibility with respect to such choice points rather than being entrenched in certain behavioural patterns.

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