Policy Games for Strategic Management

In the life of each organization, situations arise that are completely new to the history of the organization. These situations are complex, surprising, urgent, inspiring, threatening and sometimes enduring. Leadership is forced to bring the organization into uncharted territory. Facing these situations, and often after a period of muddling through in a business-as-usual way, leadership has to recognize that a breakthrough response will only emerge from a previously unexplored (and, for this organization, a revolutionary) strategy process. Think about the bewilderment in a high-tech company when an emerging technology from a competitor threatens the whole existence of their organization.

The California energy crisis in 2002 is another example: by initially oversimplifying the problem and failing to identify and evaluate major alternatives, the state found itself in a crisis of its own making. If there had been proper communication about this complex system among all interested parties (e.g. suppliers, regulatory agencies, distributors, and consumers), it is unlikely that the decisions made would have proven so unsatisfactory. Yet another instance is the dilemma faced by a nationalized railway or postal service – is

deregulation an opportunity or a threat? Should they lobby against adoption of a new deregulation law, or pursue it as a great opportunity?

According to William Halal, who assessed the state-of-the-art of strategic planning in his study of 25 major corporations: *"Issues can be thought of as stress points resulting from the clash between the organization and its continually changing environment. The magnitude of change is so great now that the social order has become a discontinuity with the past, creating a deep division between most firms and their surroundings that allows the environment to bear against the organization like a drifting continental plate. Issues comprise the societal hot spots that are generated at this stressful interface, forming social volcanoes that often erupt unexpectedly to shower the corporation with operational brush fires"* (Halal, 1984, p. 252).

Two examples of such change are cited in the following pages. Suffice it to say that there is a class of macro-problems in uncharted territory which lead to *"bet the organization"* decisions.

How to Enter an Unknown Land?
Much has been written for leaders of organizations about the need to improve the quality of strategic decision making when one is faced with conditions of turbulence and revolution. Decisions have to be taken faster, they have to be more creative, they must draw on the wisdom of many, and they also need the commitment of several internal and external stakeholders. Academic and popular writers on strategy and policy mention the growing complexity and turbulence of the environment, the growing interconnectedness of organizations, and the growing importance of stakeholder participation and organizational responsibility. Management must become aware of the need to flatten the organizational structure because of increasing knowledge intensity and the escalating professionalism of work.

This is just a short list of the underlying causes for the need to dramatically change the style and process of strategic management. When entering terra incognita, leadership has to ensure that those involved in policy development create consistent, doable, relevant and creative strategies. These must be based on a shared understanding of context and totality, an inspiring image of the future, clear value tradeoffs and well-tested and explored alternatives for action. How is it best to realize all these demands? How can all of this be brought to life

in a typical conference room? That is the question the book *Policy games for strategic management – Pathways into the unknown* addresses. We want to show how a discipline called gaming/simulation can help organizations to realize these objectives.

There are reasons enough to become somewhat cynical when one reads the above summary. Many limiting factors in the capabilities of even the wisest individuals and the best-run organizations make it very difficult to even begin to live up to the standards of decision making now required. There are always time and resource constraints, and there is the basic human tendency to simplify complexity. Because of differing (and often conflicting) perspectives pertinent to the many disciplines and functions present in every large social structure, organizations frequently face severe communication problems. Within and between organizations, many opportunities for cooperation are never explored because of real or perceived differences in values and interests. There is often a lack of talent, imagination and/or patience to examine a strategic issue thoroughly instead of adopting the most obvious alternatives, which are easiest to implement given the existing balance of power.

Policy Exercises: Preparing for the Unknown
In the book, we analyze the structure of strategic problems in uncharted territory and explore what it takes to handle these problems. We show in detail how certain organizations have successfully dealt with them, using the policy exercise methodology based on the discipline of gaming/simulation. Experienced and responsible clients and observers of this methodology have evaluated this approach as very effective and practical. To stay in line with common practice, and also for stylistic reasons, we use the terms *"policy exercise"* and *"policy game"* synonymously.

The policy games presented in the book were created as "safe environments" where people who have a key role in confronting major problems can bring their knowledge and skills to the forefront of the strategic debate. They provide the opportunity for *"as real as possible"* experiential learning to mobilize core competencies and test the skills that may be needed in the future. They help to develop confidence and ownership and reduce the fear of the unknown.

Games have an important role in making sure that strategies are doable in the eyes of the doers. The basic assumption and thus the message of this book is that

gaming/simulation is a powerful strategic tool for organizations which are required to enter uncharted territory. A gap exists between the gaming discipline and the literature on strategic management. In professional and academic journals on policy, strategy, and organizational change, one finds little about successful gaming applications. This is unfortunate, because a properly devised gaming/simulation rapidly enhances the sophistication of the participants. The technique is particularly well suited for circumstances where the objectives are to provide an integrative experience, illustrate management techniques in an experiential manner, develop esprit de corps among a group, convey an overview or systems *"gestalt"* (the big picture), and provide an environment for experimenting with improving group process. Gaming/simulations offer a fruitful potential for melding many skills.

The Goals
Two goals motivated the authors to write *Policy games for strategic management – Pathways into the unknown.* These aims are inseparably intertwined but require independent logic to be properly addressed:

• We want to contribute to the further development of the discipline of gaming/simulation as a method to solve strategic problems; and
• We want to improve communication between our discipline and the related policy disciplines.

The current state of the gaming/simulation discipline is represented by a wide array of formats in projects where this technique has been employed worldwide. To the uninitiated, this great variety (scope, purpose, subject matter, technique, nature of the product, etc.) implies that gaming/ simulation is all things to all people. The image conveyed does not contribute to the credibility of the discipline.

The irony, of course, is that the allied fields of policy, strategy, and organizational change are each well-established users of gaming/simulation. The difference is that each of these fields tends to select gaming applications as specifically appropriate to their need. As a consequence, colleagues from these fields are often unfamiliar with the broader spectrum, the history and the methodology of the discipline of gaming/simulation. Policy issues must increasingly be resolved under conditions of complexity and there are few effective techniques for dealing

with these situations. With the book, we want to show that a well-understood, clear, replicable and practical method to create policy games exists for the unique decision situations that organizations sometimes face.

Key Concepts
The more conceptual parts of the book analyze the gaming/simulation approach. This approach is relevant for strategic problem solving because – in a well-structured, transparent and effective way – it can put into operation a large number of the lessons that have emerged from the literature that deals with resolving macro-problems. To capture these lessons in a tangible format, we define five key process criteria for handling macro-problems or *"bet the organization"* decisions. We have labeled these criteria the **"five Cs"**: *complexity, communication, creativity, consensus,* and *commitment to action.* We give a short introductionto these key concepts below.

Complexity
Macro-problems are complex from a cognitive point of view. Framing such problems correctly is difficult. There are many variables involved, but no one knows what and how many the important variables are. The same is true for the relationships between the variables. The causes of the problem are often obscure, and so are the future trends. There is no overview or solid past knowledge of how to act vis-à-vis this problem. Usually, many potentially relevant sources of knowledge are available, but the existing knowledge household might prove to be scattered and incomplete, and its elements are often of unequal quality. It is not available in a format useful for decision making, nor is it shared by the relevant people.

In the case of the IJC Great Lakes Policy Exercise, the policy exercise designers had to identify and cope with close to a thousand variables. The exercise was intended to help the assembled group arrive at a holistic understanding of a complex problem. This could only happen if the "shared images of reality" were viewed as authentic by a clear majority of the hundred (or so) policy makers as they debated the best course of action to pursue (this story is told in Chapter 3 of the book).

The first criterion for entering the terra incognita of macro-problems is that one must apply a method for handling the complexity of such a problem. As we will demonstrate, gaming/simulation can produce policy exercises in which many

different sources and types of data, insights and tacit knowledge can be integrated in a problem-specific knowledge household. Furthermore, these policy exercises provide an environment that allows the exploration of possible strategies for entering uncharted territory. These games offer a safe environment to test strategies in advance. They help decision makers to create a possible future and allow them to *"look back"* from that future. We call this capability of gaming *"reminiscing about the future"* (Duke, 1974).

Communication
Communication is essential when important decisions are to be made. There are not many organizations in which one individual has the authority to make strategic decisions alone. Even when a final decision will be taken by a single individual or a limited number, these top decision makers have to rely on and collect the wisdom of many people within and beyond the borders of their organization. In complex situations where a group must resolve a perplexing issue, traditional modes of communication have proven not to work very well. New methods are needed which provide an overview and stimulate gestalt communication. The book will show that policy games, if applied properly, are a hybrid form of communication. They are hybrid in the sense that they allow many people with different perspectives to be in communication with each other using different forms of communication in parallel. We label this the multilogue characteristic of policy games (Duke, 1974).

Creativity
In many cases, problems can be approached with new combinations of proven and well-tested lines of action. But this can only be done if the analysis of the problem leads to the *"aha"* effect of recognizing the analogy between the new situation and familiar examples. Discovering analogies is basically a process of creativity: it needs the playful exchange of perspectives and the retrieval of intuitive or tacit knowledge. Accumulation of experience in a person, a team or an organization leads to the development of a repertoire of responses to many different challenges. As Mintzberg (1994) points out, finding the appropriate response to a challenging issue is not a science, but a craft. It is about combining experience with creativity to find a new, original, inspiring and adequate pathway into the unknown. To the extent that science does *not* have a complete answer, the policy exercise can provide a disciplined approach that requires confronting the known and the unknown.

'[S]cience is an endeavor in which one gets such wholesome returns of conjecture out of such a trifling investment of fact" (Mark Twain)

The Dutch philosopher Johan Huizinga (1955) has made a major contribution to the understanding of the fundamental link between play and creativity. In his famous study on man as a player (*Homo Ludens*), Huizinga puts forward the thesis that innovation can only be achieved by play. In the free and safe activity of play, and consequently in the free spirit of a playful mind, the individual can go beyond the borders of the limiting forces of everyday life. Only through play can new combinations be developed which, according to Schumpeter (1934), is precisely what innovation means. Policy exercises combine the realistic element of simulation with the playful stimulus of gaming. People in roles explore the dynamic consequences of the available knowledge base in a free and stimulusrich environment. They test each other's responses to trigger novel alternatives and to challenge and play with any idea that seems to have potential.

Consensus

New challenges often bring out old, and sometimes unsuspected, conflicts of values. Organizations in a steady-state situation have often developed a balance in *"frozen"* conflicts. In most organizations, conflicts of values and interests have been brought to rest. They have resulted in workable arrangements: compromises that reflect the existing power balance. In short, there is a workable degree of consensus. But in turbulent times, in periods of transition, and under the strong pressures of major challenges, this consensus will be tested. The power balance might shift because the owners of new and suddenly relevant resources (skills, knowledge, networks, capital, etc.) want a stake in the issue. Newly affected parties appear in the arena and the old supporting stakeholders may become marginal or even hostile. As a consequence, *"new rules of the game"* have to be defined. There is a need for a new consensus, which, preferably, should not be the result of a long and costly battle in the period after a strategy has been chosen. The concerted action and support of many stakeholders is needed to deal with major problems. Gaining understanding (with regard to complexity), finding a novel course of action (with regard to creativity), and the negotiation of consensus should all be part of the process of communication which precedes the adoption and implementation of a strategy. A painful and conflict-ridden collective thought experiment is much more desirable that a conflict-ridden and stalled implementation process.

The simulation character of policy games helps to avoid a major threat involved in other forms of finding a consensus. When a group of people reaches consensus without proper analysis or without looking beyond the borders of traditional perspectives, there is a real danger that only politically feasible and easy-to-implement strategies will be discussed. In the literature, this is called *"group-think"* – and the history of organizational decision making is full of fateful examples of this phenomenon.

Policy games are *"social simulations"* (Van der Meer, 1983) in the sense that they model the social organization around an issue. They put real people in roles as caretakers of certain interests and positions and distribute resources as in real life. They allow players to explore the consequences of the issue at hand within the existing structures and rules. In a game, one is often surprised to discover that the gains and benefits of a certain strategy affect parties in a completely different way than expected. Win-win options might be discovered, and the *"early warning"* nature of the game might signal potential win-lose situations at a stage when policy adoptions can still be discussed.

Commitment to Action
People are action-oriented beings. This is especially true for individuals who have a long career of *"making things happen."* Of course, strategy without action is not strategy at all. Initiatives lacking the entrepreneurial drive to succeed will soon end up on the pile of good intentions. That is why a good process for entering into the unknown must create a commitment to action for those people whose energy and endurance is vital to the success of the strategy. Charismatic and dedicated leadership is important, but, increasingly, this is not enough. In the de-layered, more knowledge-intensive, more professional and faster-moving organizations of our time, strategy is realized in the day-to-day decisions of many individuals and teams in the work force at the points of interaction with clients and other stakeholders. More and more people are active in realizing a strategy as relatively autonomous decision makers. It is essential that all members of a group move into uncharted territory at the same time. This presupposes that all the individual actors understand the problem, see the relevance of the new course of action, understand their roles in the master plan, and feel confident that old skills or skills to be acquired in due time will help them to conquer the obstacles and seize the opportunities ahead.

A Short History of Policy Gaming

Space permits only cursory attention to this topic. Suffice it to say that there is a rich history of gaming activity and much of it relates to policy concerns. The purpose of this section is to describe the origins and evolution of the policy exercise as a relatively new phenomenon that emerged out of a very old tradition. Games are as old as humankind, and have always had a culture-based learning function. Tribal rituals, games of the young knights in the Middle Ages, the childhood games of our youth; these are all examples of games to internalize rules and master important skills.

Games for Learning

Gaming has been used for centuries as an exercise in military strategy; the technique has also been widely used for other serious learning purposes. Since World War II, gaming has expanded its scope to include theoretical and practical endeavors in every imaginable discipline. Beginning with the advent of training games for business, the field has broadened to embrace the social sciences and educational needs of modern society. Information and communication technology has fundamentally changed (and will keep on changing) the gamer's toolbox. The new technologies have given the gaming discipline an enormous boost. Improved computational, graphic and communication methods have resulted in games with more dynamic realism, a much shorter production time, and simpler facilitation procedures. The element of simulation can also be found in games from the past. In their extensive study of the history of games and play, Gyzicki and Gorni (1979) found that backgammon is the oldest known board game in the world, dating from 2450 B.C. Backgammon, of which many varieties exist all over the world, simulates a match on a track court.

Early War Games

Sun Tzu

The origin of war games is unclear; however, it is likely that chess was one of the earliest versions of this activity. The game of chess, originating in the army of India around the fifth century, simulates a war between kingdoms. Not only the shapes of the figures, but also the hierarchy and the mobility of the pieces represent the structure of an army from that period. Shubik (1975) found concepts of gaming and elements of a theory of strategic gaming in the writings of a great Chinese military genius, the general Sun Tzu (original about 500 B.C., republished 1963), whose book on the *"art of war"* is still widely read.

Certainly there is a great similarity between chess and many of the later versions of war games played on a board as the symbolic equivalents to warfare. They represented abstractions of military confrontations, and by the turn of the 18th century, they were formalized to ensure consistency of play governed by rules and standardized penalties. Significant changes were introduced into the *"new"* German war games in that actual maps (instead of a grid game board) were used, and a greater complexity was introduced into the decision structure. By the 19th century, because of the different requirements for *"realistic"* as opposed to *"playable"* games, their construction split along the lines of *"rigid"* and *"free"* games. Both versions tended toward a higher level of sophistication, but whereas the former version relied heavily on formalized procedures to govern play (maps, charts, dice, extensive calculations), the free games substituted the judgment of experienced umpires to expedite the play. Both have been employed as techniques for analyzing and evaluating military tactics, equipment, and procedures.

Casimir (1995) studied two 19th century German textbooks on war gaming in the library of the University of Göttingen. In Von Aretin (1830), Casimir found a discussion on the development of war games between 1664 and 1825. Von Aretin sees a development of constant decrease in the level of abstraction and a growing complexity of the games. Casimir quotes Von Aretin's very modern-sounding opinion on the value of the war game as a tool for training: *"that playing a game is better than listening to long, tiring, half-understood and quickly forgotten lectures or paging for hours through books"* (Casimir, 1995). In Meckel (1873), Casimir found a summary of the many advantages of war games compared to other forms of learning, such as practice in giving and receiving orders. This, as

Casimir rightly points out, is quite comparable to modern experiences with the use of games to train for teamwork (Geurts, et al., 2000).

The two major forms of war games, free play and rigid play, still exist. Both are used as techniques for analyzing and evaluating military tactics, equipment, procedures, etc. The free-play game has received support because of its versatility in dealing with complex tactical and strategic problems and because of the ease with which it can be adapted to various training, planning, and evaluation ends. The rigid-play game has received support because of the consistency and detail of its rule structure and its computational rigor. In addition, the development of large capacity computers has made it possible to carry out detailed computations with great speed, and thus enabled the same game to be played many different times. These developments have allowed for an increase in the number and types of war games.

Concurrent with these developments, there has been an increased popularity of war gaming, and the technique has spread to other countries. Initially, West Point copied various British versions, and war gaming developments have continued in the armed forces to the present. Prior to World War II, Admiral Isoroku Yamamoto convinced the Naval General Staff to stage a theoretical attack on Pearl Harbor during the annual naval war games. During the early days of the Gulf War, some 50 years after the attack on Pearl Harbor, newspapers reported that Norman Schwartzkopf had been given operational responsibility for this mission in Kuwait and Iraq. Schwartzkopf was selected because he had prepared a new and surprising strategy for this mission in a war-gaming exercise. These are just two of many instances where military leaders have utilized games for both training and problem-solving purposes. One thing is clear: war gaming is a very important predecessor of the form of policy gaming described in the book.

Modern War Games
Over a 3000-year period, the prime use of war games has been for instruction. However, they have also been used for analysis (as in the Pearl Harbor incident), particularly with respect to testing alternative war plans. The Axis powers made more extensive use of war games during the period leading up to World War II than did the Allies.

In addition to the Japanese Naval War games previously mentioned, the Japanese Total War Research Institute conducted extensive games. Here, military services

and the government joined in gaming Japan's future actions: internal and external, military and diplomatic. In August 1941, a game was written up in which the two-year period from mid-August 1941 through the middle of 1943 was gamed and lived through in advance at an accelerated pace. Players represented the German-Italian Axis, Russia, the U.S., England, Thailand, the Netherlands, the East Indies, China, Korea, Manchuria, and French Indochina. Japan was not played as a single force, but instead as an uneasy coalition of the Army, the Navy, and the Cabinet, with the military and the government disagreeing constantly on the decision to go to war, X-day, civilian demands versus those of heavy industry, etc. Disagreements arose and were settled in the course of an afternoon with the more aggressive military group winning most arguments. Measures to be taken within Japan were gamed in detail and included economic, educational, financial, and psychological factors. The game even included plans for the control of consumer goods, which, incidentally, were identical to those actually put into effect on December 8, 1945. Postwar military gaming efforts have reached high levels of sophistication, approaching the ingenuity displayed by science-fiction writers. There have been other extensive war gaming developments since the advent of the computer. For reference purposes, see Shubik (1975), Brewer & Shubik (1979), Osvalt (1993) and Boer & Soeters (1998). On a happier note, gaming efforts are now being directed towards the pursuit of non-military purposes as evidenced by the examples.

Positioning Policy Games
The above section has made clear that gaming/simulation has a long tradition and that games can have many forms and functions. Although we explain our view on the policy exercise in more detail in later chapters, this introductory chapter provides an initial definition and positioning of policy games.

Meaning of Play – Central Characteristics
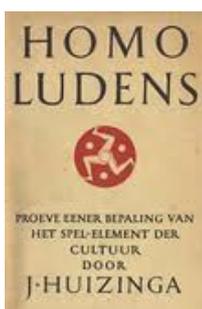
J. Huizinga –

Homo Ludens

Play is a central human characteristic; a basic counterpoint to life itself. The Dutch philosopher Johan Huizinga has probably contributed the most to the systematic analysis and philosophical interpretation of the concept of play. Huizinga (1955, p. 1) views man as a game-playing animal: *"play is to be understood ... not as a biological phenomenon but as a cultural phenomenon. It is [to be] approached historically, not scientifically."* Huizinga notes that animals play, therefore playing is not solely a human activity. Games have been a fundamental aspect of our lives from infancy. There is both playful play and serious play (e.g. Russian Roulette as a pastime by soldiers on the front line). Huizinga claims that play is the basis of culture from which myth and ritual derive. In his book *Homo Ludens*, he finds several elements that define a game (see also Geurts, et. al, 2000). In this context, he states that play:

• Is a voluntary, superfluous activity (one enters into it out of free will);
• Is stepping out of real life into a temporary sphere of activity;
• Means being limited in terms of time and place;
• Has fixed rules and follows an orderly process;
• Promotes the formation of new and different social groupings;
• Is itself the goal; and
• Is accompanied by a sense of tension and joy and the awareness that the activity is different from normal life.

There seems to be a contradiction here: is a game only a game if the activity itself is the goal? For Huizinga, game and play are the main forces for cultural change and innovation: only by stepping out of the ordinary routine of everyday life will individuals discover new routes and perspectives. *"Culture arises in the form of play,"* says Huizinga (1955, p. 46). There is only a hazy border between play and seriousness. Just as humankind is able to develop more and more games for joy and entertainment, in the same way, there seems to be no limit to the fantasy of people when creating games in which creative and learning effects are directed towards a consciously chosen *"outside-the-game"* goal.

Comparison of Simulation vs. Gaming
Gaming is valuable in part because it responds to a human need – people crave information: they enjoy exploring, discovering and learning. They do not like just to be told about something; they learn most readily from concrete instances and

information strong in imagery. A simulation generally involves a detailed representation of reality in a computer whereas, in a game, the players are the central part of the model construct. Gaming has some valuable features:

• It is an explicit statement that provides a framework that incorporates player strategies in an integrative structure;
• It permits players to employ these strategies in a group process;
• It provides the opportunity to break through old interpretative frameworks; and
• It brings many ideas to bear on the problem at hand.

What is simulation? The Latin verb *"simulare"* means *"to imitate"* or *"to act as if."* Duke (1980) defined simulation as *"a conscious endeavor to reproduce the central characteristics of a system in order to understand, experiment with and/or predict the behavior of that system."* To be able to simulate the behavior of a system, one creates or uses a model of that system. Leo Apostel (1960, p.160) defines a model as follows: *"Any person using a system 'A' that is neither directly nor indirectly interacting with a system 'B,' in order to obtain information about system 'B,' is using 'A' as a model for 'B.'"* Simulation models are specifically made to help clients understand the systems in which they are embedded.

A model can have many different forms: a road map, a three-dimensional representation of a building, a mathematical algorithm or a complex computer program possibly accompanied by graphical representation. A gaming/simulation is a special type of model that uses gaming techniques to model and simulate a system. A gaming/simulation is an operating model of a real-life system in which actors in roles partially recreate the behavior of the system. The word *"partially"* refers to the fact that a game can contain many other elements that play a part in simulating the system, such as maps, game pieces (e.g. poker chips) and computer software . The game invites the players to jointly create a future from a starting position.

Step by step, they make decisions, alter cooperative or competitive relations, and act within the rules of the game on the basis of their joint or individual insights and preferences. The policy exercise can be thought of as a small group problemsolving technique that offers a means of experimenting with the management of complex environments (these are often called *"wicked problems"*). The approach clarifies these problems and demonstrates to managers the need to be proactive in exploring a variety of solutions before a decision is

taken.

A simulation is an operating model of the central features of a system; that is, it shows functional as well as structural relations (Greenblat, Duke, 1975). Some simulations are operated within computers, other types are performed by human players. This eliminates the need to build in psychological assumptions. The actions of players within the game consist of a set of activities aimed at achieving goals in a limiting context with many constraints. At this point, a clarification of terminology is important since this definition of gaming/simulation encompasses a wide range of exercises. Business games, war games, operational gaming, management games and other exercises with a great variety of prefixes fall into this category. The function of these gaming/simulations will vary. There are exercises to motivate a group, ice-breaking activities, games for education and training in schools or organizations, and games for policy making. Our focus is on the latter and we will start to explore them in the next section.

Figure 1.1 helps to illustrate the nature of these different approaches. The figure shows that the level of abstraction appropriate for policy exercises can be placed between very abstract games and very detailed large-scale simulations that prove useful for operational planning in well-understood areas.
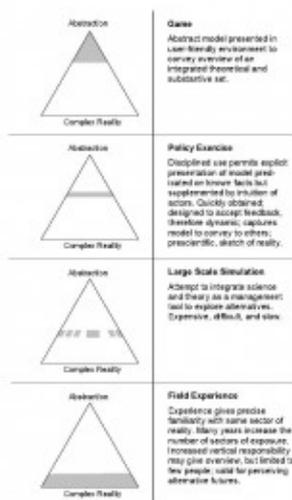

Figure 1.1

Policy Games: One Form of Gaming/Simulation

A policy exercise is a gaming/simulation that is explicitly created to aid policy

makers with a specific issue of strategic management. A policy exercise will function as a managerial support process that uses gaming/simulation to assist a group in policy exploration and execution. A large and growing number of professionals devote a substantial part of their energies to the effective use of gaming/ simulation tools. In each new situation, the professional has to complete essentially the same sequence of activities:

• Validate the decision to use this approach;
• Clarify the client's needs;
• Structure the problem effectively;
• Develop a prototype exercise;
• Test and modify the prototype;
• Deliver the exercise to the client; and
• Evaluate the final product.

A major characteristic of the policy exercise approach is that it allows players to experience the complexity of strategic problems and their environments. It allows the players to understand the interaction of social, economic, technological, environmental and political forces that exist in planning and decision making problems. The objective of a policy game is to create an operating model of the problem environment that is general and structural. The use of a game employs a process that lets the participants debate the model; it also makes the model vivid so that it will be retained. As a consequence, facts and particulars will be better understood (bits and pieces now have a logical place to be stored). It is best to think of the policy game as falling along a continuum of related phenomena ranging from sports and pastimes, educational games, policy games, manmachine simulations, and pure simulation to the mathematical theory of games (Figure 1.2)
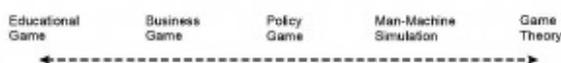

FIGURE 1.2 | CONTINUUM OF RELATED PHENOMENA

Figure 1.2

Meier (1962) described gaming/simulation as *"invention in reverse"*; it transforms a macro-phenomenon into a workable exercise. The degree of compression in time and scale must achieve a reduction or magnification of several *"orders of*

magnitude" as it combines experience with technology, frequently using trial-and-error methods. There is the challenge of retaining verisimilitude while selecting one part per million. The challenge of designing an exercise is well stated by Meier & Duke (1966, p.12): *"… the real challenge is to reproduce the essential features of a (complex system) in a tiny comprehensible package. A set of maps is not enough. Years must be compressed into hours or even minutes, the number of actors must be reduced to the handful that can be accommodated in a laboratory …, the physical structure must be reproduced on a table top, the historical background and law must be synopsized so that it can become familiar within days or weeks, and the interaction must remain simple enough so that it can be comprehended by a single brain. This last feature is the most difficult challenge to all."*

The policy exercise method uses a variety of design features to ensure a seamless integration of the final product. Both Richard E. Meier (1962) and Harold Guetzkow (1963) have emphasized simulation as an *"operating representation of the central features of reality."* The list of techniques from which to draw is long; however, these are central:

- The selection of critical variables
- Contrived face-to-face groups
- Role playing
- Time compression
- Scale reduction of the phenomena
- Substitution of symbolic for alpha-numeric data and vice versa
- Simplification
- The use of analogies
- Replication

A policy exercise typically involves extensive preparation and analysis of the system being addressed, setting the stage for a workshop where expert participants work through scenarios from various stakeholder perspectives. The game is made to represent the current situation in an organization; very often the policy exercise is used only once. That means that great care has to be given to the aspects of validity, reliability and credibility. The policy exercise is designed to provide a shared image of the complex system under investigation. This enables participants to communicate about the issues, appropriate strategies, and the probable impacts of policy decisions. To be able to deliver these services to a

client, the game designer has to use a wellstructured design process. Given the nature of policy games, this design process must include:

• Techniques from model building (to represent the system);
• Concepts from strategy theory (how to model the strategic *"space"*);
• Design techniques for ad hoc work environments (ergonomics; e.g. players have to be able to handle the materials and master the rules and steps of play); and
• Techniques involving arts and crafts (e.g. creating visual representations).

Armstrong and Hobson (1973) have developed a useful diagram (Figure 1.3). If simulation (Quadrant I) can be described as the reasoned reaction to complexity.
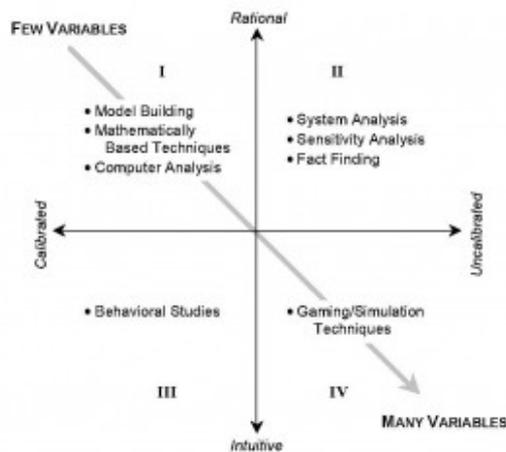

FIGURE 1.3 | DECISION HELPING TECHNIQUES: A TYPOLOGY

Figure 1.3

Simulation (pure Quadrant I mathematical simulation) cannot be used as a foundation for the synthesis of complex systems to invent new patterns. Simulations only allow you to repeat history – they do not permit a group to *"play"* with new ideas, whereas games allow a group to *"invent"* the future. Simulation must be exclusive in the variables it incorporates; a game is inclusive and forces players to confront these factors even though they are vague. Simulation is useful in purely scientific environments (e.g. sending humans to the moon) where the environment is data-rich and the solution must be mathematically correct. However, in dealing with problems that have Quadrant IV characteristics, there is a risk of over-reducing complexity and oversimplifying the problem. If a Quadrant I technique is used in a Quadrant IV environment, things must be rationalized, measured, logically structured, quantified, and carried through a

logical process that gives logical results. Incorrectly employed Quadrant I techniques can produce a self-fulfilling prophecy; on the other hand, a properly used policy exercise can, and often does, produce profound counterintuitive results.

Towards a Professional Gaming Paradigm

The gaming/simulation approach to strategic problem solving described in the book is a multidisciplinary and eclectic modeling methodology. It is nurtured by and uses theorems and techniques from a wide variety of professional and academic fields. Humankind has created many areas of expertise, each with its own knowledge, tools, recipes and specialized skills that are potentially relevant when designing a strategic game to analyze a perplexing strategic problem. Figure 1.3 positions policy exercises on a continuum of modeling techniques that are reflected in the main disciplinary and professional areas the reader will encounter in this book. The book will hopefully convince the reader of the added value of the risky but stimulating adventure of crossing the borders of the many mature and fast-moving disciplines that appear in Figure 1.4.
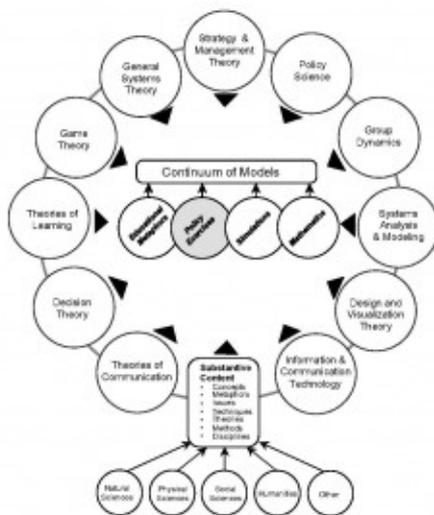
Figure 1.4 | The Policy Gaming Paradigm

Figure 1.4

Multidisciplinary oriented academics, like the authors, are motivated by strong ideals of enlightenment, relevance and the unification of science. However, they run the risk of falling into the trap of academic hubris or even worse, of propagating and using half-understood or obsolete knowledge from fields that are not their own disciplines. There is only one good preventive line of conduct to

avoid these fallacies: dialogue with specialized colleagues: in our case, with the disciplines of organization and strategy.

Case One – Strategy Making in a University Hospital

The Client
As far as the strategic agenda for the University Hospital was concerned, there were several issues that needed hospital-wide thinking and concerted action. For example, the future patient flow was expected to change radically, from inpatient care to outpatient care. One of the forces behind this was the need to reduce healthcare costs. The case is a good example of some of the core functions of gaming. It is about collective futuring in a safe environment in order to experience the problems of current strategic patterns and to explore new and more productive lines of behavior. It is also an interesting example of strategy making in a large professional organization. The intended outcome was not so much a strategic plan of action but rather to improve the strategic capabilities of all the relevant professionals who actually create the future of the hospital in their daytoday actions.

The University Hospital is part of a large Dutch university, and is also one of the most highly regarded medical institutions in the Netherlands. The organization has three primary processes: patient care, research, and education. In the Netherlands, all academic hospitals fulfill these three functions, and the non-academic hospitals usually restrict themselves to patient care. The client hospital was a very large and diverse institution. The many different functional departments all exerted constant pressure internally to search for the optimal contribution to the three primary processes. However, this does not mean that the hospital was not affected by pressures from its environment. On the contrary, one of the more pressing issues at the time of the project was how to respond to an emerging trend in healthcare policy. Increasingly, organizations like the hospital had to work more closely with local peripheral health institutions. The hospital's initial structure was strongly dependent on the concept of the matrix organization. This proved to be incapable of dealing with the complexity facing the organization. Due to internal and external pressures, a new organization structure had been introduced some eight years earlier. The Board of Directors created a divisional structure that proved to be rather successful. This was based on the business unit structure adopted by many large corporations in the private sector. The model that the new structure followed was the concept of the

functional division in which the three primary processes were fully integrated.

Division management was given considerable autonomy to decide on resource and task allocation. In the divisions, medical professionals were *"put in the lead."* Cooperation with other divisions was accomplished via contracts, and coordinating structures were created for the training programs and the multidisciplinary research programs. The supervising board took on more of a coaching and facilitating function and formalized the agreement with the divisions in contracts and budget statements. Within the 11 newly created divisions, the managers proved to be successful in managing their own operations and staying within their budgets. External assessments of the hospital research and training showed that the new structure was both efficient and effective: the assessments continued to be rated good to excellent. However, for some members of top management, the new structure created an awareness of a serious danger: perhaps the innovation had been too successful.

The Problem
The division structure had been operational for several years. Some members of the Hospital Board and some division leaders had observed a tendency by the division managers to focus primarily on issues of their own concern. The Board of Directors considered this to be a serious problem. When resources had to be divided over the 11 divisions, the division managers defended the interests of their own division as much as possible. The new division structure and the idea of the medical professionals being in the lead assumed that the division managers would agree on resource distribution while balancing divisional and general hospital interests. It was further assumed that they would be able to do so without strong interference from the Board of Directors; however, this proved to be very difficult. Gradually, some members of the hospital administration began to worry that there was neither sufficient stimuli in the new structure nor a proper attitude to take care of the interests of the whole hospital both now and in the future. At the same time, there was no real interest in reinstalling the Board's former central powers. The challenge was to solve this danger of a *"tragedy of the commons"* within the existing structure.

As far as strategic and hospital-wide challenges were concerned, there were several issues that needed strategic thinking and concerted action. For example, in the future, the patient flow was expected to change radically from inpatient care to outpatient care. One of the forces behind this was the need to reduce the

cost of healthcare. The Board of Directors, working with the senior managers, identified several problems:

• Within the hospital, there were internal and structural determinants that complicated decision making on organization-wide issues;
• Divisional managers had developed stereotypical behavior that complicated the search for an organization-wide strategy; and
• The hospital as a whole was confronted by a strategic challenge so important that the Board of Directors had to take the initiative to drastically improve joint decision making.

These convictions and insights were not yet shared by all the division executives and central services managers. In order to meet the expected future challenges, a shared awareness and definition of the problem was needed among both the members of the Board and all divisional management team members.

Goals, Purposes, and Objectives
The policy exercise had to fulfill two main goals within the hospital organization. On the one hand, the hospital management needed to become more aware of the problems mentioned above. In that sense, the game had to function as a mirror. On the other hand, the game needed to help the participants explore more productive ways of making decisions that were vital for collective future success. This was called the *"window on the future"* function of the game. These two goals can be divided into four objectives:

• Participants had to learn about known and unknown strategic challenges within their organization. There needed to be an increased awareness of the problems of the internal organization and in the rapidly changing external environment;
• Therefore, the participants needed to develop a joint problem definition. The game needed to help them to communicate about the general organizational obstacles;
• Participants had to learn to act more flexibly. This was unavoidable in the complex organization of the hospital environment; and
• The game needed to stimulate the participants to develop a more positive attitude towards change. It had to motivate employees to consider important conditions for change in the organization.

Why Did the Client Select the Policy Exercise Process?

The Board of Directors had tried to communicate their concerns about the problems through a report and several discussion meetings, but this effort had no serious effect on the behavior of the relevant managerial echelons. For this reason, they adopted a Board member's suggestion to apply the gaming technique. This member of the Board had heard about the potential experiential learning power of the gaming tool. He was convinced that top professionals working in the hospital would be more open to this involving and confrontational type of interactive learning than they had been to reports and non-committal discussions.

Specifications for Policy Exercise Design
The exercise was designed for use in an eight-hour framework that included the introduction, playing time, and a debriefing session. The game was designed for 36 people and was to be used only once. The exercise was initially intended for the Board of Directors and Division Management. During the interviews in the systems analysis phase, it became clear how important the department heads were for the gamed problem (departments are units within the division usually chaired by a professor). Several of these senior professionals indicated that they did not want to be excluded. After careful reconsideration, the Board of Directors decided to involve the department heads. Finally, the following participants were selected:

• Hospital Board of Directors (4 people);
• Divisional Management Teams (11 times 3 people: a senior professor as chairman, a manager of patient care and a finance and operations manager); and
• Department heads (variable numbers).
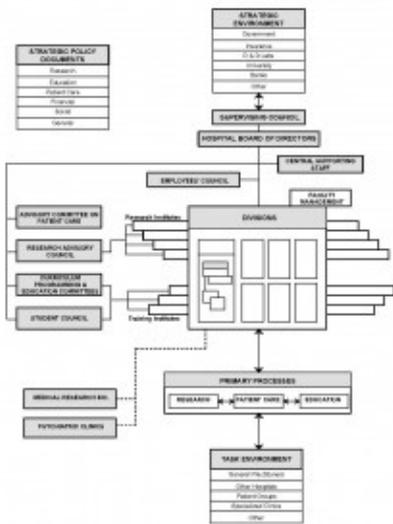
The Schematic: A Model of Reality

FIGURE 3.1 | UNIVERSITY HOSPITAL SCHEMATIC (SIMPLIFIED)

Figure 2.1

A schematic of the problem was developed in an attempt to create a visual presentation of the internal and external characteristics of the hospital (see Figure 2.1). The initial description of the problem environment usually emerges in discrete, partially organized, and sometimes conflicting pieces. It is the task of the research team and the client to synthesize these elements of the system into an integrative and explicit model that can be easily described and discussed. The objective is to develop a graphic on a wall-size chart which contains the "Big Picture," or an overview of all the considerations that might be significant to the policy issue being addressed by this process. This schematic is an indispensable element of the game design process and its use brings about some surprising results.

The schematic is discussed more fully in Chapters 7 and 8 in the book.

Description of the Policy Exercise
The design team followed a formal process to create, employ, and evaluate the policy exercise. Only a few steps central to the understanding of the significance of the exercise are described below. The design team consisted of four external gaming specialists and two members of the hospital organization. This team had several meetings with an ad hoc advisory group within the hospital. The design team studied a large number of documents and

interviewed many representatives of the managerial echelons. A number of external experts were also interviewed. A period of 15 weeks elapsed between the initial agreement on the project contract and the final use of the game. In

cooperation with the client, the consultants decided to develop an open game format. In this case, it was not important that the effects of decisions be simulated in a detailed way (the participants were expert enough to know what the results of certain actions would be). What was needed was a very flexible form of role play on the basis of one or two scenarios about the future. The game needed to start with steps of play that mimicked the normal routine of decision making. The game was to be observed by external experts. Both the experts and the players were able to ask for timeouts to discuss and possibly improve the style of collaboration and negotiation.

The scenario was as follows:
It is now January 2003. The strategic plan for 1997 (the year in which this game was played) is valid. The organization has not changed much compared to 1997, but some relevant developments have taken place in the meantime. The emphasis has been put more and more on the transformation of care to permit patients to be increasingly cared for in their own environment. For this hospital and other large hospitals, this has led to a radical decrease in the number and duration of admissions, while the number of outpatient treatments has clearly risen. The Ministry of Health, with the support of the Association of Academic Hospitals, has approved the enlargement of the hospital's outpatient clinic to twice its current size; by the end of 2003, a plan of implementation has to be ready. The plan has to be neutral budget, which means that the resources have to be reallocated internally. In addition, the plan must be supported by the Board and the managers present at this meeting.

Major Sequence of Activities
Pre-Exercise Activities – The Hospital Board sent personal invitations to all participants announcing the date of the Hospital Strategy Simulation. To give the participants enough time to prepare, the organization took great care to provide clear information concerning the goals to be reached. The invitation to all participants asked that they contribute to the realization of the plan. In the plan, many deciions had to be made, including the distribution of the budgets for the divisions (for research, education, patient care and personnel). The participants had to decide how these decisions were to be made, by whom, and when. All participants played roles that corresponded with their real positions within the hospital organization. In the game, the hospital had six divisions with corresponding management teams. The board was fully represented and present

during the exercise. Several department heads played the roles of the leadership of the coordinating research and education programs, positions they also held in real life.

Policy Exercise Activities – The participants started play in the morning with a rolespecific brainstorm session about the consequences of the enlargement of the outpatient clinic. They had to take into account the consequences for budgets and personnel and the effects on research, education and patient care. The remarks were written on flipcharts and, after the brainstorm session, every team had to give an opening statement; this technique ensured that all the participants were informed about the others' points of view.

The next step consisted of deliberation and negotiation. The participants had the opportunity to meet other teams to talk about the proposed approach for doubling the size of the outpatient clinic. Important aspects of this part of the session were continuous consultation, lobbying, and informal decision making. After that, a meeting was held between the Hospital Board and division chairpersons. The other players were the audience; however, they were permitted to intervene with written questions. In the afternoon, a new cycle started. Each original team had a new opportunity to offer a brief opinion about the outpatient clinic and the negotiations and meetings. The Board provided a response to these interim statements and some observations by the external experts were discussed. For the second time, the participants had the opportunity to meet other teams informally and talk about the plan. This was followed by another meeting between the Hospital Board and the division chairpersons. The other teams served as the audience and were permitted to intervene.

Post-Exercise Activities – Finally, an extensive and lively debriefing session was held with the players and the consultants. Summaries written on the overheads were used to extract interesting remarks, and to explore the ambitions of the participants. The objective of the last activity of the exercise was to evaluate and learn from the sessions. Questions addressed included: What have we achieved today? What have we done differently than usual? Did we do better than normally? What do we have to do differently from now on? Each team had to summarize its deliberations on an overhead sheet, and these were used in the critique. Questionnaires were completed before and after each cycle of play. The results were publicized in the final report.

The Results
During the game, attention was directed primarily towards the first goal (hospital members should become more aware of the problems) and, to a lesser degree, towards the second goal (exploring strategic challenges). Agreement about the problem was a necessary condition for the success of the concept of *"medical professionals in the lead."* The game assignment had required them to make a plan for the strategic challenge presented in the scenario; this was used primarily to obtain a joint problem definition and secondly to give some insight into possible solutions.

With regard to the first goal, the game can be considered a success. This can be concluded from the debriefing and the questionnaires. In January 1998, a final report that contained conclusions by the participants and consultants was sent to the Board of Directors. Four important lessons can be distinguished:

• The Board of Directors should consult the division managers about strategic issues before establishing a policy framework;
• The division managers should consult each other more often about strategic issues;
• Ways need to be found to take advantage of the expertise of the nursing and financial managers for the formulation of the general hospital policy; and
• There is a need to pay attention to the essential role of the department heads and other executives in developing and implementing the general hospital policy.

The participants agreed about the overall value of the simulation, but when answering the question: *"Did you learn anything?"* they indicated that the upper hospital management had probably learned more than the participants themselves. This can be seen as a remarkable unanticipated result. During the game, top management paid little attention to the department heads (many of these players complained that they were bored and underused). In the evaluation, this led to the recommendation to involve them more intensively in the client's policy cycle.

Case Two – Globalization and Pharmaceutical Research & Development
In this case, a large U.S.-based pharmaceutical company had developed the idea of starting an R&D facility in Europe. R&D management, whose task was to put this strategy into operation, had to address several important questions: Should we expand into Europe? If yes, what activities should we expand? Do we need to

acquire new skills? Where should we locate these new activities? And, how should we best implement these plans?

They opted to use a policy exercise that required top management to explore the issues in a simulated environment as they thought through the implications. The result was unexpected, in that the leading option at the outset was *rejected in favor of an alternative that was not articulated until the exercise was played*. As a consequence, much smaller sums of money were put at risk and favorable results were achieved in a fraction of the time the initially favored option would have required.

This case is noteworthy because it was a good example of the game design process actually guiding the strategic debate. The project covered both the phases of strategic analysis and strategic choice. The participatory systems analysis proved vital for the proper framing of the problem. In this phase, it became clear that enormous sets of data had already been collected. The game design process helped the client to develop a format for analysis so that scattered data became real information. It proved essential to ensure that all the tacit knowledge of the relevant professional functions was used.

The Client
The client for this project was the pharmaceutical research and development division of a large international drug company. The company was faced with increasing problems in getting new products developed and to market. A multinational, publicly held corporation, the company had substantial existing foreign investments. In response to an expanding global awareness, they were concerned with remaining competitive in the rapidly changing pharmaceutical industry. To remain competitive, they had to adapt to a changing environment; it was essential for them to examine the corporate mission as it needed to change in the future. To achieve the goal of timely product introduction worldwide, thus increasing market share and profitability, it was felt within the company that its drug discovery and development effort had to be extended into new markets; the establishment of new foreign discovery capabilities was thought to be essential. A new R&D facility in Europe was believed to be their best option.

An earlier decision to expand in another country had not gone well. Analysis revealed that this was largely due to a failure to recognize the complexity of the decision environment and the importance of involving key personnel in the

process. As a consequence of these difficulties, management resolved to use a process that would involve the appropriate people within the organization from the outset. Due to many uncertainties associated with this decision, they elected to use a policy exercise to help them decide on a specific location. The aim was to have a consensus-building activity that would draw upon the wisdom available within the organization.

The main decision under consideration concerned the expansion of pharmaceutical R&D facilities. Since the decision would impact on many facets of the corporation, the proposed European Discovery Facility (EDF) needed to be evaluated in terms of key endogenous and exogenous factors, with a future's perspective in mind, as the 5-year, 10-year, and 25-year implications of any decision were investigated. At an operational level, they were concerned with how to implement the EDF to enhance the company's long-run global posture.

The external considerations affecting their mission were:

• The state of the global economy;
• The public's growing concern over the burden of healthcare costs;
• A shift in the provision of healthcare services from the expert to the concept of self-help;
• The possibility of reduced rates of return in the pharmaceutical industry;
• The prospects for supporting research and development with diminishing resources; and
• The increased significance of new product introduction in the pharmaceutical industry.

In response to these changes in the industry, they had to address a number of strategic and operational issues. Strategic issues that were considered included:

• Research and development productivity;
• The company's foreign role;
• Internal standards and their application abroad;
• Enhancement of a global posture; and
• The strategic policy implications of a European Discovery Facility.

The Problem
In an effort to remain competitive in a rapidly changing international context, the

company decided to seriously examine the pros and cons of locating a research facility in Europe. The problem was to identify all the significant variables, to delineate these variables in some clear format, and to analyze them to establish their relative priorities. All of this was accompanied by the need for participatory decision making and effective communication among the staff of the R&D Division, as well as with other divisions and upper management. In this particular case, the problem that was initially presented by the client was: "In which country should we locate this facility?" After a period of time, the question changed to four broad questions that addressed both strategic (what?) and operational (how?) considerations: Should we expand? If so, how should our capability be changed? Where should we locate? And, how can we bring this transformation about?

The 16 tasks given to the participants during the exercise were designed to help the R&D staff formulate an accurate and innovative conceptualization of the EDF problem. Participants in the process were asked to make a decision on questions centered on the following areas:

• Discovery and development emphasis;
• Research activity proposed for the EDF;
• Therapeutic/technical mix;
• Geographic location of the EDF;
• Structure and implementation of the EDF;
• Internal organization;
• Degree of home office involvement; and
• Staffing the EDF.

Goals, Purposes, and Objectives
The exercise was developed to aid top management in formulating and assessing their strategy. The explicit objectives were:

• To assist R&D management in the development of the parameters for the proposed research facility (location, style, capacity, configuration, and primary mission);
• To provide for participatory and interdisciplinary problem formulation and effective communication among the management team facing the decision;
• To help management of the R&D Division reach consensus on the optimum siting of a new facility in Europe, thus aiding the Office of the Chairman

in reaching a decision; and

• To encourage the advancement of alternative approaches to research, thus helping to formulate an innovative conceptualization of the problem; and

• To transmit to appropriate staff the decision process as well as the dimensions of the problem that had to be considered in reaching a decision.

Why Did the Client Select the Policy Exercise Process?
In their attempt to deal with the problem, management selected the policy exercise methodology as the most appropriate one because of its ability to:

• Investigate the complexities of important, non-reversible decisions under conditions of uncertainty by identifying all the variables under consideration, delineating them in a clear format; and analyzing them by establishing relative priorities;

• Provide explanatory, if not predictive, insights about the problem and its environment to participants in the process;

• Overcome disciplinary, language and cultural barriers; facilitate communication in a situation where varied jargon was used; induce and evoke a high level of participation; and, allow participants of widely varying perspectives to gain a shared overview of the problem;

• Compress time, and when employed through several cycles representing defined time spans, enable the long-range outcomes of one or another course of action to become more   comprehensible; and

• Augment the rational systems approach to problem solving by allowing infusion of subjective judgments into the process.

Specifications for Policy Exercise Design
The successful development of an exercise requires a careful delineation of responsibilities and lines of authority. These, and other appropriate administrative matters, must be fully resolved before the substantive material is addressed. In this case, it proved necessary to explain the approach to the central stakeholders. Although the technique is very old, its use in serious policy debates in large corporations is relatively new. Special attention on the part of the project team was required at this stage to legitimize the effort. The project team consisted of researchers from the University of Michigan, an internal (client) advisory committee and external consultants. The duration of the project was negotiated to be four months. It was important at the outset to define the criteria that would later serve as the measure for the evaluation of the product. The

objective of the specifications was to raise and address specific questions that pertained to and anticipated the final conditions that would govern the design and use of the exercise. This is a natural extension of the problem statement, in which the objectives and constraints for assessment of design, construction and use are made explicit. In this particular case, the specifications included a definition of the intended audience, primary goals, stylistic considerations (reflective, mutual problem-solving style), and practical constraints: duration (one day), number of participants (12-18), computer usage, room and material requirements, and the planned recording of the participants' responses.

The participants were drawn from the Research & Development, Control, International, Medical Affairs, Manufacturing, Regulatory Affairs, and Treasurer divisions. These participants were senior staff members who were asked to work from one of five "perspectives." The perspectives did not coincide exactly with the position these participants held in real life; rather, they were an amalgamation of several executive responsibility areas. The players were selected on the basis of their familiarity with the actual role that was subsumed under that perspective.

The Schematic: A Model of Reality
Several trial schematics preceded a final form for delivery to the client. This graphic had been reduced to those factors considered relevant within the constraints of the problem statement; this process of selection took place in the context of an ongoing dialogue with the client. The final document needed to retain enough detail to adequately represent the problem environment; however, it also needed to communicate the central aspects visually and quickly. It became an integral part of the exercise and provided the frame of reference for the policy exercise activity. A simplified version of the final schematic of the EDF problem environment is presented below in Figure 2.2 The schematic places the following elements in relation to each other:

• The primary stages of the drug development and drug discovery process;
• The interaction of this process with related exogenous processes (competition, universities, etc.);
• The primary in-house (endogenous) perspectives (medical, marketing, regulatory, management, manufacturing and science);
• The relationship of the discovery and development process with the rest of the company, the market and the company owners;
• A wide range of endogenous and exogenous concerns placing the discussion

about the discovery facility against a 25-year time horizon; and
• The four central questions that the gaming exercise addressed: What was the future of the drug development and discovery process? What type of facility was required? Where should it be built? And, how can the plan be placed into operation?
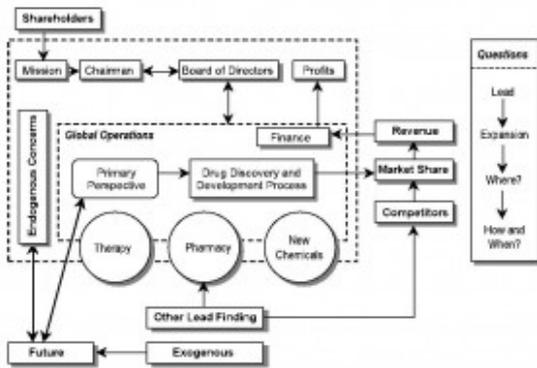

FIGURE 3.2 | SCHEMATIC OF THE PHARMACEUTICAL CASE (SIMPLIFIED)

Figure 2.2

The interactive development of the schematic was an important part of the process for the client who viewed this document as extremely valuable. The schematic was significant for the following reasons:

• It showed the client that the consulting team had reached a mature understanding of the problem and its environment; as such, it was an early step in the legitimization of the project;
• It served as a discussion vehicle because it forced the respondents who held different views on how the organization functioned to resolve those differences among themselves. Conflicting views of the "big picture" had to be integrated into this compromise view;
• It forced all the different stakeholders to look beyond the boundaries of their normal work environment and, in doing so, it established a sharp image of the problem; and
• It was a solid basis for the selection of the main topics to be addressed by the exercise.

The problem set, as initially perceived, was too broad to be included in the exercise. The factors of primary concern were identified based on the original problem statement and the specifications. The schematic proved very useful in

the process of selecting components for inclusion in the exercise. The process guaranteed that the exercise met the primary criteria: it was situation specific, relevant and parsimonious.

The evolution of this schematic experienced a dramatic moment! It had been reviewed and approved by all senior staff except the Vice President of Sales (the design team had not been allowed to present the draft to Sales because "We create products; they sell them!"). After the schematic was finalized, the design team prevailed in getting access to the Vice President of Sales. He immediately recognized that the drawing was invalid in capturing the primary research flow process – it failed to illustrate products that were licensed at the several decision points in the development of a product. The schematic was redrawn and an intense debate followed; it was approved as modified. During the play of the game, this information proved decisive in rejecting the leading pre-game strategy and in the development of an unexpected (and successful) final strategy.

Description of the Policy Exercise
The EDF format employed participants playing roles that represented diverse perspectives on the problem. The exercise consisted of 16 tasks designed to help the R&D staff formulate an accurate and innovative conceptualization of the problem. The focus of attention was on the parameters of the primary mission (location, style, capacity, and final operational configuration). The overall purpose was to identify the R&D activities that would increase their ability to remain competitive over the next 20 years.

The scenario focused on the question: What should their strategy be to be successful in the 21st century? The scenario outlined a brief history of the corporation, the company's mission, the pros and cons of a European Discovery Facility, and future considerations from a variety of perspectives (science, medicine, management, manufacturing, marketing, regulatory activities, international concerns, drug development, etc.). The scenario focused on the premise that the expansion of the research and discovery activities in Europe would:

• Contribute to their acceptance as an international pharmaceutical company;
• Increase scientific networking with the international academic community;
• Allow them to tap local and regional knowledge relevant to new drug discovery;
• Expand the pool of scientific talent that they could tap to fill critical staff

positions;
- Improve their ability to develop drugs outside the U.S. regulatory climate;
- Accelerate the registration process in the region where the facilities were located;
- Allow for more effective capacity to respond to regional disease entities;
- Expand marketing potential outside the U.S.; and
- Inject fresh ideas and approaches into the thinking of the R&D organization.

During the course of the exercise, events were introduced to update the scenario; players were expected to evaluate the impact of these events on their decisions. The roles in the EDF exercise represented the key perspectives that influence the R&D process. The participants were asked to assume and represent the issues and concerns that would be particularly important for each perspective. Following are short role descriptions for each role.

- The Management Advocate Role was responsible for administrative efficiency; management style; personnel and staff development; finance, including budgeting; and efficient utilization of resources; and exogenous concerns such as economic conditions in the marketplace and communications.
- The Manufacturing Advocate Role dealt with equipment and technology requirements, production scheduling, development, feasibility, and efficiency; its exogenous concerns were new process technology developments, governmental standards and controls; and consumer safety.
- The Marketing Advocate Role had to think through strategies on product promotion and recognition, pricing, corporate image, product line; and analysis of domestic and international markets and distribution, market share, competition, and cultural sensitivity to therapeutic needs.
- The Medical Advocate Role was responsible for thinking through strategies that related to lead finding, therapeutic needs, new indicators, product introduction, drug development and testing technologies. Exogenous concerns included access to and strength of academic/clinical contacts, clinical support, journal publication, data transfer, and cultural sensitivity to therapeutic needs.
- The Regulatory Advocate Role was to create the strategies about internal control standards, licensing, and corporate liability. Exogenous concerns included country-specific drug registration, patent requirements, governmental standards/controls, consumer safety, and political concerns.
- The Science Advocate Role focused on strategies that related to lead finding,

pre-selection of new drugs, pharmaco-therapeutic concepts, new chemical entities, drug development, internal research environment and support, and research flexibility. Exogenous concerns were access to the scientific community, publication in journals, new drug development technologies, communication and data transfer networks, external lead finding, new chemical entities, pharmaco-therapeutic technologies and concepts.

The complex nature of the problem being addressed by the EDF exercise required that players have access to a wide variety of specific and factual information. As the exercise did not intend to make factual experts of the players, the majority of the information and data was presented as accessory material that was available for players to draw upon as the need arose. This information assisted players in realistically assuming and playing their roles. The data was made available through a number of formats including document files and abstracts, topic-specific notebooks, charts, and graphs.

The need for accessible information dictated a format that allowed for easy filing, storage, retrieval, and presentation of data essential to the decision-making process. The selected format made extensive use of graphic displays, indexed notebooks, and computerized database capabilities. The room layout and environment was similar to a war room model. Graphic displays were posted in ready view of all participants and additional information was easily accessed in the notebooks or from a computer. Trained staff was in the room to assist as required.

The document files provided a source of primary, uncondensed data for the players. Information contained in the document files was also abstracted. The abstract directory, abstracts and document files were available to the players throughout the exercise. The most important and pertinent information was condensed into topic-specific notebooks of the following types:

• Country-specific notebooks for each country being considered as a potential EDF site;
• Topic-specific notebooks pertaining to the subject areas of the advocate roles;
• Strategic question notebooks containing background information and evaluation criteria; and
• A notebook containing historical and current information on the corporate mission, goals and strategies, growth and profit, public image, public interest and

other general types of information on the corporate operation.

These formats were used to simplify the presentation of data and encourage its use; they promoted the desired policy exercise format and playing environment. Following are some examples of the types of data presented through this form:

• Country/company-specific production over time;
• Country/company-specific market shares over time;
• Country/company-specific drug development activities;
• Competition and market share;
• Drug development costs;
• Regulatory criteria and timelines for U.S. and international registration; and
• Markets and market share.

Major Sequence of Activities
Pre-Exercise Activities – Participants were required to participate in a three-week pre-game set of activities. The first week, they were given a reference manual and access to reference staff. The next week, the participants received pre-game reading materials, which raised substantive and theoretical issues. Finally, one week before the exercise, the vice president of R&D made a presentation to all the prospective participants; at that time, he again emphasized the significance of the project. The project team then distributed pre-game manuals. These manuals had 17 steps; each step was a pre-structured decision exercise, related to one of the central questions of the exercise. Each participant, acting alone, was required to answer all the questions from the perspective of his or her role. The pre-game manuals were returned to the project team for evaluation and encoding onto wall charts. This process forced each participant to assume a posture on each question; during the game, these were modified after discussion.

Before the beginning of the exercise, the facilitator gave a brief introduction to orient the participants to the exercise. Next, the participants were given the player's handbook including the introductory information, problem background, problem schematic, scenario, sequence of activities, role descriptions, as well as the following questions:

• What is the industry-wide future of the pharmaceutical drug discovery and development process?
• What is the mission of the proposed EDF facility? How should this be defined?

• Where should the EDF be located? What key attributes should be used to rate individual countries?
• How should the EDF be placed in operation? This question addressed the physical plant, internal organization, the degree of home office involvement, and staffing as key components.

In addition, participants were given a suggested format for a response to the questions, an individual decision form, a group reconciliation decision form, abstracts drawn from the document files, as well as other appropriate data and/or information. After going through these materials, the participants filled in a matrix on future impacts on drug discovery. This concluded the pre-game activities.

Policy Exercise Activities – The actual play of the exercise consisted of three cycles. Each cycle addressed one of the strategic questions introduced during the pregame activities. By addressing these questions in the order they were presented, the participants evaluated and made judgments on the essential variables in the EDF location decision. If, for some reason, an important variable was missing or was not accurately represented, the participants offered suggestions about possible new variables or representations.

Each cycle represented one progression through the steps of play. The progression of activities within each cycle was characterized by three general activities (phases): value clarification and strategy generation (advocate position phase); strategy evaluation and design of a hybrid strategy (reconciliation phase); and impact evaluation (impact evaluation phase).

In the first phase, the participants assumed the roles of advocates for various interests in the drug discovery and development process. These interests included the scientific, medical, management, marketing and regulatory perspectives in the drug discovery process. In the advocate roles, the participants formulated strategies from their role's perspective and identified the values and assumptions on which their strategies were based as a response to the strategic question presented at the beginning of the cycle.

The participants were asked to take a critical look at the question: Europe or not? Based on their previous detailed consideration of the proposed European Discovery Facility, they were now asked to use the insights they had gained to

compare their chosen European location with other alternatives including expanding at home, further development of a facility in Japan or other possible locations. In the second phase, the participants had to reconcile their differences and produce a group strategy. All the participants made judgments and acted in the corporate interest as defined by the corporate mission statement. In this phase, the players evaluated the recommendations from the previous phase, considered forces and events outside the corporation, formulated a hybrid strategy in response to the strategic question, and developed a mission statement.

In the third phase, which occurred after all the strategy questions had been addressed, the impact of the selected events and various strategies were examined. The impact assessment was based on 25-year forecasts generated by the exercise participants. This involved evaluating the decisions they had just made. Participants were asked to step out of their roles; they were required to summarize the decisions that had been completed. In reviewing their decisions, participants were asked to keep in mind the importance of getting the EDF on line as quickly as possible. The group was given the task of constructing a decision tree that helped to summarize their individual responses to the previous tasks.

Post-Exercise Activities – After the third cycle ended, the exercise director led a post-game discussion and evaluation. The first phase of this debriefing involved letting the players discuss the things that happened during the exercise. This allowed the players an opportunity to leave behind their feelings and emotions about the exercise. Following this catharsis, the model of the EDF problem that had been presented in the exercise was analyzed from the perspectives of the different roles. Finally, in the last stage of the debriefing, the players and the facilitator made an effort to assess the EDF problem as an actual decision. This was achieved by reviewing strategy statements from the three cycles, evaluating overall strategies with regard to corporate goals, introducing events, and reviewing the possible impacts of events on decisions to be made.

The Results
In this case, it was essential that the results of the exercise be transformed into a report that captured the main arguments, opinions, and any agreements or decisions that might have been reached. In the run of the exercise, all conversations of the players were tape-recorded (each of the five groups individually as well as the general group discussions). The process was self-documenting in the sense that all group and plenary votes were registered on the

wall charts. Staff summarized all information in one document, a white paper that captured the discussions, points of consensus, and areas where there was still a difference of opinion.

This *"white paper"* summarized the response and supporting rationale to the four primary questions raised about the Pharmaceutical Drug Discovery and Development process (in the context of an EDF). In addition to presenting the results of the exercise to the company Board of Directors, a follow-up version of the exercise was used in the management development program of the company as a hands-on case study of in-house decision making. The exercise was evaluated using a composite set of criteria based on the design specifications and our general objectives in designing a strategy formulation exercise. Although the exercise was not evaluated extensively, a systematic feedback component was built into the materials. Participant evaluations were elicited through post-game debriefings that included an informal discussion of the process and results of the exercise as well as a questionnaire that assessed the success of the exercise on several criteria.

The data from the questionnaire indicated that the participants perceived the policy exercise to be successful in accomplishing most of the stated objectives. They were particularly satisfied that the exercise created a positive atmosphere for open discussion of the sensitive issues. All the participants felt free to contribute their perspectives on these issues. Furthermore, it was their overwhelming opinion that the exercise was an enjoyable process for formulating company strategy. They felt that the policy exercise uncovered aspects of the problem that they had not been aware of before and that they themselves had come up with some new ideas that were given careful consideration. The process of development of the exercise modified the perception of the problem, thus changing the definition of the problem itself! Because of the design process used, it was possible to use progressive insights into the problem. It was discovered that product development as seen by R&D was only part of the picture (it undervalued products that were licensed during the several stages of product development). This led to a re-framing of the problem and, in the play of the exercise, a new and innovative solution was conceived that involved not building a new center at all.

In this particular case, the client viewed consensus as a very important issue (a prior decision had *not* been based on consensus and significant problems had

resulted). This exercise did not guarantee that the resulting consensus was the "best" one – there is no decision process that leads to "certain" results in highly uncertain environments. The purpose of the exercise was not to predict or reach a final decision, but instead to be sure that the actors were very carefully grounded in the data, rationale and literature of the problem and to ensure them an opportunity to be heard.

Before the start of this project, the client had assembled literally a room full of data. For several years staff had collected data and expert opinions, and many studies had been completed. One of the activities of the project was to develop a computerized system for storing this information. In designing the exercise materials, a careful effort was made to connect the data and the literature with the process. For each question the participants addressed, there were specific documents that dealt with that concern. In this way, a considerable amount of data was brought into the process. They were buried in data, some of which had been transformed into information; knowledge was largely segmented on a *"need to know"* basis; and they were in dire need of wisdom for making their decision. The process used for this game/simulation facilitated an effective data -> information -> knowledge -> wisdom sequence.

The EDF process resulted in the formulation of two options for the structure and organization of the proposed facility. The group came close to making a consensus decision. The first option was a centralized facility located in one of several (specific) countries, while the second option was a satellite concept that would identify and support the best available talent wherever this might be found. Both of the options would tap resources unique to the European scientific community and enhance their potential to discover new pharmaceutical agents for research and development.

The client readily acknowledged sharp changes in the players' views of the new facility resulting directly from the exercise experience. Interestingly, the decision ultimately taken by the company was unique, dramatic, and clearly emerged during the discussion of the exercise: *"... through your gaming technique you allowed us to come to closure on this problem and to present to ...[The Board of Directors]... a proposal which will have profound effects upon the future of the R&D program ... the concept was very enthusiastically received and final closure for action was achieved."* (Director of International Programs, June, 1985)

The Potential of the Policy Exercise
The Emergence of Policy Exercises
Games are as old as humankind. They are used for different reasons – to entertain, to educate and, in some instances, to find a solution to a policy problem. They provide a planned, safe environment where participants temporarily remove themselves from reality. Within the artificial reality of the game, it becomes possible to deal with problems such as uncertainty and risk in a playful, relaxed and functionally focused way. Perspectives can be taken which are not possible in a serious day-to-day setting. Historically, gaming was a tool of the military that was adopted by business schools and the applied social sciences. In the past three decades, the technique has been employed with growing success in non-military strategic policy making. The potential of these applications is far from exhausted; the most exciting developments still lie ahead.

As a form of applied science, the concept of the policy exercise did not come out of the blue. It evolved from techniques widely referred to in the literature as gaming, operational gaming, gaming/simulation, simulation, and decision exercises. Evidence of the presence of these techniques dates back to the 1800s in their use by military strategists to develop mental discipline; other games of strategy date from a much earlier time. Recent uses of the discipline have extended far beyond their original military purpose and far deeper than their role as a social pastime; indeed, gaming is now common practice in the social sciences, public policy, business, management science, and a host of other disciplines.

Macro-Problems and Strategic Management
Large organizations are now using policy exercises for strategic management purposes to elicit a shared vision of the unique and confusing challenges we have called macro-problems. The book concentrated on these latter applications. (In Chapters 1 and 2, we described and analyzed the macro-problems that organizations confront.)

The causes of the underlying problems are varied; exogenous influences are usually important causal factors. However, organizations also often contribute to the negative impact of these situations through a variety of reasons, including:

• Management may lack an adequate, shared perception of the problem; this results in decisions being taken predicated on tunnel vision;

• Whatever organizational structure may be in place, the pressure of a macroproblem is often coincident with the emergence of a value dilemma, a lack of mutual trust, avoidance of productive discussion and/or open conflict;

• Macro-problems tend to create urgent situations that demand attention *now*; as a consequence, managers tend to respond to short-term considerations. Some fear the consequences of their actions and lack commitment to the decisions taken; others display hubris, resulting in an escalation of commitment to disastrous policies;

• Hundreds (sometimes thousands) of variables are in play in a given macroproblem; this is bewildering to even the most dedicated management team. In these situations, they may postpone a decision and be forced to act when confronted by a crisis; and

• The reasons cited above contribute to another problem – the failure to consider enough alternatives and/or create adequate novel strategies; as a consequence, sub-optimal decisions are taken.

Unable to attend to all the factors and their interrelationships over time, individual managers and other stakeholders focus on the few aspects that appear to be the most influential or hit the closest to home. However, by selecting a limited set of variables, each individual is also establishing a unique conceptualization of the situation, leading to different perspectives on the formulation of effective strategies. Personal values and human cognitive limitations generate different interpretations of the same situation. Other factors that contribute to variations in individual perspectives include perceptual and cognitive biases, personality, individual competence, and organizational or social roles.

Macro-problems typically involve implicit or explicit disagreement about actual or potential strategies, reflecting competing views on the nature of the decision environment. The issue is usually partially the result of prior disputes internal to the organization or in conflicts concerning the definition, classification, and evaluation of a problem at the interface of the organization and its environment. Individuals with different professional, cultural, and divisional backgrounds are likely to view a strategic situation differently, reflecting their own values, interests and perspective on how the world operates. These internal differences are another source of dispute that is as much of a problem as are issues originating as clashes between the organization and its environment; both have

the potential for igniting brush fires with similar results.

In the book, we documented these and other characteristics of the intellectual, political and cultural crises that macro-problems create. The difficulties organizations experience in dealing with these challenges can be thought of as a single underlying problem best described as a lack of synthesis of the knowledge and aspirations of the individual members of the organization. In turn, this is the result of the lack of any reasonable communication format to address these situations.

The multi-dimensionality of these *"messy"* macro-problems demands hybrid strategic processes which, in accordance with Ashby's law of requisite variety, can do justice to the unique and seemingly chaotic constellations of factors and forces. We have summarized the demands on such a process with the five Cs: *complexity, communication, creativity, consensus* and *commitment to action*. These process criteria are recognized by many experienced strategists and in leading publications on strategic management. However, they are very hard to make operational in one and the same process. Traditional management methods need to be integrated and supplemented in situations that have macro-problem characteristics. The new approach must be faster, employ a team, be reasonable in cost, be flexible, and be capable of assimilating a very large number of variables that derive from both exogenous and endogenous environments. Policy gaming is such an approach. We characterize it as scoring high on a *"scale of strategic power."* By this we mean the ability of a decision aid or process technique to put the five Cs into operation in a fast and efficient process. The policy exercise employed must be precisely responsive (in terms of the five Cs) to the uniqueness of the macro-problem.

Policy Exercises and the Five Cs
This book has shown that the extremely complex strategic issues we call macroproblems can be clarified through the use of carefully constructed policy exercises. This process of policy gaming helps decision makers as they attempt to creatively find a way through the *"terra incognita"* of the macro-problem they confront.

Gaming is not only strategic thinking, but also strategic action. The property of games to remove the participants temporarily from daily routines is very helpful in keeping them focused on a strategic issue. Participants are sheltered from

political pressures and from the stifling effects of etiquette and protocol found in real-life situations. The interactive situation and *"virtual reality"* created by the game can quickly convey enduring structural information. In that sense, a game is a communication mode that is capable of linking tacit knowledge to formal knowledge by provoking action and stimulating experience.

Policy gaming, as described above, shows that there is no essential difference between learning and problem solving. As a consequence, when confronting uncertainty, an experiential learning process can be very powerful, especially when it can be combined with a scientific (systems analytical) approach. The process presented here of designing policy exercises as dynamic, open models of a problem situation incorporates features from both learning theory and general systems theory. Problem solving requires creative experimentation. Policy gaming is a realistic but sheltered experimentation within the system of complexities in which the problematic situation is embedded. The power of games is that they organize and convey a holistic erspective on a given problem in a format that allows the direct translation of these holistic insights into orchestrated strategic action. At the same time, games help to develop new knowledge because they allow participants to experiment with behavior and strategies never tested before. For the most complicated strategic macroproblems, policy exercises translate existing knowledge into action and potential action into knowledge. It is this determining property of the kind of gaming described in this book that makes it a major tool to assist policy makers in coping with the increasingly complex problems that confront organizations and societies today.

Within the context of a game, one develops a highly organized jargon or special language that permits the various participants to talk to each other with greater clarity than they might through traditional communication modes. At the beginning of the last century, ships at sea still communicated brief messages to their land base via carrier pigeon. Carrier pigeons are no longer used; rather, computers, radios, and satellites keep a continuous surveillance of all ships. As the communication forms of a previous era (e.g. telegrams), have given way to improved forms over the past century, it is inevitable that still more sophisticated forms must evolve. Both role-playing and expert panel games can facilitate effective communication within diverse groups (multilogue as opposed to dialogue), encouraging consensus building and bridging communication gaps Another feature of the gaming approach is the conflict resolution and consensus

seeking that is facilitated by the multilogue communication process. The game works as a vehicle for transmitting and clarifying the various perspectives and interests among the participants.

Through their participation in the game, the stakeholders have an opportunity to present their perspectives and encounter others of which they were unaware. During the joint experimental action in the game, value debates become focused, sharpened and placed into operation in such a way that value tradeoffs can be negotiated. This increases the chance that the views of many different stakeholders will be considered in the formulation of a strategy and that these stakeholders will understand the rationale behind the strategy that finally emerges. This communication of perspectives and the establishment of a value tradeoff is desirable to eventually secure consensus and thus acceptance of and commitment to the emergent strategy.

As they move collaboratively through the game adventure and towards the assessment of possible impacts of major decision alternatives, the participants become involved, reassured and motivated. However, in a positive sense, the game is, at the same time, a startling and demystifying experience. The process of objectification that takes place in a game helps to reinforce memory, stimulate doubt, raise the right issues (disagreement forces further discussion), and control the delegation of judgment (those who are affected can check the logic of action). This *"virtual look into the future"* also helps to explore the unfortunate situations and conditions in which an elected strategy got off track and/or became a fiasco. All this fosters the power of these *"exercises in explicitness"* to prevent escalation of commitment. The exercise places the potential of failure on the policy agenda and that makes it much easier to redirect a failing strategy in the future.

Games serve as vehicles to develop realistic, mature, and well-grounded commitment. In summary, the policy exercise is a versatile method for dealing with complex and ambiguous issues; it has established itself both theoretically and practically as a valid means of portraying complex realities and of communicating coherent overviews of those realities. The technique conveys sophisticated information with novel perceptions of the interrelationships involved. In a pragmatic sense, the power of this approach derives from several underlying concepts (defined above). When carefully integrated in an exercise designed for serious purpose, gaming techniques:

• Are relatively quick and inexpensive (compared to the limited number of alternative methods available);

• Are palatable and somewhat seductive; this derives from the well-documented fact we humans are *"game playing animals"* (Huizinga, 1955);

• Permit the creation of a safe environment for learning where risky notions can be explored under controlled conditions; and

• Induce the suspension of disbelief among participants that is required if new ideas are to be given a fair hearing.

Policy Gaming as a Strategy Process

Policy gaming is more than attending a policy game. In our view, policy gaming is an integral participative strategy process. Its architecture has been described in Chapters 7 and 8 of the book; there are five broad phases in which 21 specific steps are followed. The actual run of the policy game is only one, albeit important and highly visible, step in this collective process of inquiry and communication.

The gaming process is an interactive and sequential process to help sharpen the problem statement and the specific objectives to be achieved. The 21 steps guide the client organization through a series of collective inquiries and communication activities producing interim results that help the organization to arrive at a holistic understanding of a complex problem. As understanding improves, more detail is added and the developed exercise becomes a professional seminar with a playful and involving character. It also has an effective and efficient content and format. Previous chapters in the book have shown the conceptual roots of this methodology. Like any innovation, the process architecture of policy gaming is a hybrid, a new combination of techniques. It combines, functionally, ideas and tools from a wide variety of relevant disciplines, such as systems theory and modeling, learning theory, strategy theory, participative management, communication theory, group dynamics, organizational behavior and project management. We have used several analogies and comparisons to explain how the different steps in the process form an integral and consistent whole. For example, we have referred to interactive modeling, participatory policy analysis, and multi-loop learning. All these references help us to explain our choice for the step-wise, cyclical and interactive format of the process of policy gaming described here. Concepts like *"cognitive map"* and *"knowledge household"* have been introduced to convey the ability of policy gaming to accommodate an enormously wide variety of substantive inputs. In modern academic terms: our

approach supports the pleas for a constructivist and discursive approach to strategic management.

The eight cases presented and analyzed in Chapter 3 of the book show the 21 steps in action. Some of the insights about this process are summarized below. The process guarantees on-time delivery of tailor-made products under severe time pressure. The process realizes ideals and demands of good project management under the very difficult conditions which macro-problems create for clients and supporting professionals. The value of this feature of the process cannot be underrated – the kind of problems described in this book inevitably cause chaos and confusion.

The process facilitates contingency. In each of the eight cases, a different gaming approach was needed and created. For that purpose, the method has several provisions and tools that help to explore, frame and analyze a problem from the perspective of the five Cs. Parallel to the substantive analysis of the problem, the approach helps to establish what the necessary contribution of the gaming process should be. A unique profile of process ideas emerges that is summarized in the specifications for design and tested in several other steps.

Each of the five Cs has several anchor points in each of the phases of the gaming process. The resulting impact on the five criteria is reached step by step when progressing through the gaming project. For example, the mastering of complexity is made possible by provisions in almost every step of the process. Commitment is definitely not only the result of participation in the game but also the product of many different involving and motivating elements in the chain of events. Similar observations hold for communication, consensus and creativity. We consider this cumulative, progressive character of the process one of the important factors explaining the success of the projects described. An effective overall strategy is critical to the organization's successful day-to-day operations. This point was made by Peter Drucker when he suggested that it is more important to *do the right things than to do things right."* Moreover, strategic decisions on macro-problems are synonymous with high stakes because many of these decisions require large commitments of capital over long periods of time. Incremental decision making and allocation of resources may not be an option. The combination of internal and external constraints may force the organization into high-risk decisions that would normally be avoided. The risk is especially great when high stakes are combined with a high level of uncertainty about the

outcomes of a strategy; this is frequently the case when the decision is made in a turbulent environment and lacks precedent within the organization. It is often true that one individual has the final authority to set policy for an organization; however, that person is usually well advised to seek the counsel of close associates. The book attempts to document the evolution of a new and powerful process architecture designed to assist those groups who are responsible for collaborating on the creation of policy for their organization. In Chapter 4 of the book, we have shown how empirical research supports the idea that, for certain turbulent environments, an interactive form of strategy making is the most desirable.

Research also suggests that the internalization of such a form of strategy making is a strategic (i.e. competitive) competence for an organization, especially when combined with the skill to alternate between process styles. An increasingly complex world has required that professionals concerned with strategic management develop and disseminate generic interactive techniques that can be quickly applied in a disciplined, professional manner to assist top management in orienting itself to rapidly changing situations. Policy exercises are most often used in exceptional situations to engage busy managers, support staff and experts to confront and negotiate issues, and to elicit a shared vision or plan for the organization in those situations where precedent is of little value. It seems worthwhile for an organization that has once used this process with satisfaction to install the skills and procedures to make policy gaming a lasting part of its strategic repertoire.

In Chapter 5 of the book, we have conceptualized gaming/simulation as a hybrid communication form, as a language for complexity. Mastering this language is an important strategic skill for organizations. One could also call it essential to modern society because of the complex nature of policy issues, both public and private. It is essential that these multi-dimensional issues be addressed in their totality as a gestalt phenomenon. Serious games have evolved as a form of human communication centering on situations that are symbolically represented in a relatively safe context. As its point of departure, gaming takes the view that man is a grammatical being (Campbell, 1982). Thus, gaming is instrumental in extracting the dynamics of communication and inter-subjectivity, and hence helps to reveal and capture the essence of thought and behavior as it is exhibited in complex situations. As with every language in its infancy, the structure (grammar)

of the policy exercise has not yet been rationalized (most people who use a language do so without an explicit understanding of the inherent rules of that language). The technique of gaming/simulation urgently needs thoughtful attention to this structure. However, even in its current stage of development, the technique provides leadership with a realistic method to integrate a diversity of skills and understandings; when effectively internalized by an organization, it serves as an ongoing forum for inventing the future.

Properly designed games can be viewed as abstract symbolic maps of various multi-dimensional phenomena. As such, they serve as basic reference systems to assist in the formulation of inquiry from a variety of perspectives. If these constructs are properly elaborated, they can represent not only a present reality but also alternative futures. In this era of data overload, there is an urgent need for the acquisition of heuristics, a flexible set of highly abstract conceptual tools which will let those responsible for the strategy of their organization view new and emerging situations in a way that permits comprehension and in-depth discussion with others.

Rephrasing Drucker's famous expression will make clear how we position this strategy process we call gaming. It is true that it is most important to *"do the right things."* But it is not easy to find out what they are. Our book strongly supports the claim that, when confronted with macro-problems, policy gaming is the right way to discover *"the right things to do."*

The Discipline of Gaming/Simulation
The two goals that motivated us to write the book (to contribute to the development and dissemination of gaming/simulation as a method of strategic problem solving and to improve communication between this discipline and related policy and organizational fields) have much to do with our personal conviction developed during our professional careers. An important and realistic task remains to be done: gaming/simulation must be further developed as an applied scientific inter-disciplinary field.

We believe that the book is one illustration of the fact that gaming/simulation has its own body of knowledge, its own research tradition, its own professional practice and its own forum and that it learns from systematic reflection on its professional practice. And, of course, we also hope that the future might show that this book has become a well-appreciated link in the chain of progress in the

discipline. We are optimistic about the future of gaming/simulation, but we also think there is much to be done. One important task is to better understand, internalize and communicate what the discipline of gaming/simulation really is. A well-established discipline, especially if it positions itself on the more applied end of the theory-practice continuum, will develop a permanent interaction and dialogue between application and research. Both activities are relevant forms of knowledge acquisition and both help to develop the principles and theorems of a discipline. For such an interactive progression to work, one needs a professional culture of openness and critique and an environment that brings together the professionals and academics in the field.

Gaming/simulation is an inter-discipline because it develops in part through the internalization of knowledge from other disciplines. The 21 design steps, for example, put into operation insights from several academic disciplines. However, from the point of view of professional application, each individual gaming project is always a multi-disciplinary effort. As the cases in Chapter 3 of the book show, each project needed substance that had to be drawn from many sources usually including several academic disciplines. In this sense, the interdisciplinary process know-how of gaming/simulation functions as a *"supporting science"* to organize and realize major multi-disciplinary applied studies – in our case to support strategy and policy. Framing the nature of our work in this way has many consequences, particularly with respect to the professional attitudes and skills of the individual gamer. For example, professional gamers need to have a very open mind and a broad, albeit not necessarily deep, overview of many different fields of science. They also have to be able to work productively together with many different and highly specialized individuals. Their cognitive skills have to be in lateral and integrative thinking, their social skills have to make them team players and coaches, and their aspirations have to stimulate them to serve and facilitate. An analogy that uses the evolution of statistics would be useful here. Statistics is very much an art and a science (as is gaming). There are a variety of methodological issues, approaches and techniques within the discipline of statistics; but, overall, statistics is used to serve other disciplines (forecasting, model building, etc.). Statistics is clearly defined and, as a consequence, it is very much an acknowledged and respected discipline; however, the discipline had to struggle to overcome the impression of being *"just a technique."* Practitioners of gaming/simulation would do well to reflect on the difficulties encountered by the successful discipline of statistics.

Clarity and communication about this conception of gaming/simulation as a *"supporting inter-discipline"* might take away part of the confusion about the various phenomena called games. The most central cause of the confusion is that games are typically viewed from the perspective of a particular substantive discipline; they are seen as a tool being utilized by a professional whose primary interest lies with content, not technique. This confusion is an obstacle to the evolution of the gaming discipline; authors continue to define terms and concepts from their own disciplinary perspective and against the backdrop of the unique substantive needs of the moment. This is especially true when thinking about the demarcation between gaming/simulation and the different disciplines that study policy and organization. For example, social psychology with its successful studies in group dynamics contributed a great deal to the body of knowledge that is incorporated in the gaming processes described above. On the other hand, social psychologists are very active users of games, both for their research environments to study social behavior and in their professional practice, e.g. in role play and social drama. And again, social psychologists are also often consulted during the systems analytical phases of game design to give their professional inputs for the diagnosis of the strategic situation of the client organization.

Gaming is a relatively new profession that has grown in a topsy-turvy fashion; opportunities to use gaming products have come rapidly. It must be acknowledged that, as professionals, gamers have been slow to become attentive to the need to establish a well-grounded foundation through which their products and processes can reasonably be evaluated. Designers tend to believe (with passion) in the efficacy of gaming that is predicated on an internalized model of validity of the games. Unfortunately, neither the gamers nor their clients have consistently demanded rigorous evaluation (as Chapter 6 of the book has documented).

Problems within the gaming discipline are certainly compounded because gaming professionals are scattered around the world and, as a consequence, communication is limited and intermittent. Clients present subject matter that is extremely diverse; this results in products that are quite dissimilar in their characteristics. Few gamers have had formal training in this area; they have academic degrees in a wide array of fields. Specialized academic nuclei in the gaming discipline are limited to a very few. On the other hand, there are several

professional organizations that we have mentioned (ISAGA, ABSEL, NASAGA and SAGSET). The professional journal *Simulation & Gaming* is now 34 years old and, in our opinion, better than ever. However, if the gaming profession is to achieve its goals, gaming professionals must intensify their efforts to communicate the above concepts about the nature of gaming/simulation to our contemporaries, clients, and fellow professionals. We hope the book contributes to improved communication along the interface between gaming and policy making.

Conclusion
"Today's generation has to solve, in real time, situations for which there is no precedent. These situations cover a wide spectrum of problems. They all have characteristics of complexity, a future's orientation, the lack of a clear paradigm for action, the need for a dynamic communication process within and beyond the affected organization, and finally, the need to transmit a clear image beyond the organization of any policy decision that may be taken" (Duke, 1987, p. 6).

The management of macro-problems is like a fourth-dimensional problem we three-dimensional beings cannot comprehend. We are unable personally to encounter these complicated and chaotic phenomena, and therefore also unable to communicate with one another, even at elite levels, about possible management schemes to solve some of the *"messy"* problems of today. We need to relax the constraints on our communication. This means moving to the gestalt end of the communications continuum. Here, through the proper use of gaming/simulation, we find very strong promise for re-establishing the comprehension of totality that is necessary for the intelligent management of any complex system. This is especially true with certain public policy issues. For example, how shall society, in its search for more peace, freedom and justice, deal with the new terrorist threat? Serious questions must be addressed for which we have no functional precedent, yet society is pushed relentlessly into action. There are also many private sector concerns (e.g. how shall private industry adjust its functioning to accommodate to the reality of a global economy?). Gaming/simulation has proven successful in meeting similar needs.

Dramatic and fundamental changes in society over the past century are permanent, irreversible, and profound. These changes require humankind to alter its languages to permit thoughtful and rapid speculation about a many-faceted future, and to permit policy makers to venture decisions for which there is no precedent. The complexity of these issues points out the urgent need for

conveying holistic thought. In particular, the elaboration of the concept of systems, the dramatic improvements in computers, and the rapid evolution of related technologies have generated information networks beyond ready human comprehension.

Recent trends indicate that a new growth period for gaming is about to begin. A world growing in complexity combined with the development of a discipline of gaming/simulation and the information and communication revolution may indicate a renaissance. The base of knowledge and experience from the last 30 years provides a good foundation for further development of policy gaming into a direction that most probably will surprise even the current specialists. The modern high-tech entertainment games with their virtual reality and their worldwide (internet) participation and dialogue suggest one of the sources from which the new generation of tools for the *"language of complexity"* might emerge.

As we suggested before, we are not Orwellians who believe in or aspire to a surprise-free future. It is a technocratic illusion to think that any process or technique will provide a policy maker the mythical crystal ball. Preparing for the future is a managerial responsibility, knowing the future is not. We wanted to bring across that there are better ways of taking on that responsibility. *Decision quality* is an ethical category. It refers to the situation in which those who had to take a dramatic decision and those who assisted, can without doubt and remorse say: *"We took the best decision we possibly could and we did everything in our power to prepare for its successful implementation."*

Gaming/simulation techniques hold considerable promise for improving decision quality. They have the ability to abstract phenomena to humanly meaningful terms, to facilitate the internalization of a model of a complex system, and to enable the player to operate in a dynamic environment which requires periodic decisions, the results of which are emphasized through various feedback techniques. Policy gaming is an appropriate process for dealing with the increasing complexity of policy environments and the problems of communication within these environments. Designed for organizations facing crisis, the technique provides a multiple-perspective, small-group problem-solving and decision making approach for organizational strategic management.