

Viewpoint Let The Games Begin!

By W. Brian Kreutzer

When my nephew was eight weeks old, my brother began playing a game with him. He would slowly open and close his hand while moving it closer to the baby's face, punctuating each movement with the sound "bloop, bloop, bloop." At the last moment, he would touch the baby's nose and say, "Woooo!" The baby would respond by smiling and gurgling with obvious

enjoyment. As simple (and perhaps silly) as this game was, it taught my nephew that he had some degree of control over that moving hand—if he gurgled and smiled, it would touch his nose and he would hear that funny noise again. He was beginning to see how his actions affected the world around him.

We begin playing games as soon as we are born, and continue playing

them throughout our lives. We play them at home and at the office; physically and mentally. Some games are unique to specific cultures, while others tie into universal archetypes. But almost all games have three things in common: they teach important skills; they help in the socialization process; and they are fun. Although games may become more complex as we grow older, the three core elements remain. [In this context, "games" refer to structured playing environments and not to corporate politics—Ed.]

In business settings, corporations have tended to focus mainly on the socializing benefits of games—participating in "team building" exercises, for example, which were used to develop interpersonal skills and cooperation. Games, for the most part, were not considered managerial "skill builders."

In recent years, however, a new variety of games have begun to appear in companies throughout the world. These "microworlds" or "management flight simulators" are helping managers share their mental models of strategic issues, teach decision making skills, improve strategic planning, and enhance corporate learning.

Gaming Interface

These new games are essentially system dynamics simulation models with an added "interface" that allows users to experiment with the simulation by trying different strategies and decisions. In a typical modeling project, the modeler often learns a great deal through the process of building a model, while the model remains a "black box" to the client. By making the modeling insights accessible through a gaming interface, a non-technical audience can explore the assumptions and causal links behind a system dynamics model. The black box then becomes a learning tool.

A good game design must include

Interface Software

Dynex

Dynex was the first interface design software, making it the "grandfather" of interface design tools. It supports decision-making as well as policy-making. It also allows you to create interactive menu screens and reports, which makes it possible to use Dynex for training modules. Dynex runs on the PC and is compatible with Professional DYNAMO. *Pugh-Roberts Associates, Cambridge, MA (617) 864-8880.*

MicroWorld Creator

MicroWorld Creator, designed for the Macintosh, is the fastest and easiest interface software. You can choose which decisions will be made during a game and display them in a decision box, where users type in their decisions. Using regular word processor and drawing programs, you can also design how information will be presented during a game: in reports, spreadsheets, or graphics. MicroWorld Creator is the choice when speed and ease of use is essential. MicroWorld Creator is compatible with STELLA, and can also be used as a stand-alone model development tool.

MicroWorlds, Inc., Cambridge, MA (617) 547-9898; also distributed by Gould-Kreutzer Associates, Inc., Cambridge, MA (617) 497-2926.

STELLAStack

STELLAStack is by far the most flexible interface design tool. It is essentially a HyperCard stack that links up to STELLA, which means your interface is limited only by your creativity and knowledge of HyperScript. With STELLAStack you can compare outputs from various runs and plot them on the same graph. Input values can be saved as well so they can be reproduced at any time. Although time-consuming, STELLAStack can create highly graphical and multi-media interfaces. *High Performance Systems, Hanover, NH (800) 332-1202.*

Mosaikk/SimTek

Mosaikk, which is also similar to HyperCard in its capabilities, runs on the PC. Mosaikk can run models created in both STELLA and Professional DYNAMO. Combined with SimTek, a simulation software, Mosaikk gives the PC world the same interface design power that up until now has been reserved for the Macintosh world. *ModellData A/S, N-5120 Manger, Norway 011-47-5-374009.*

DYNAMO is a trademark of Pugh-Roberts Associates. MicroWorld Creator is a trademark of MicroWorlds, Inc. STELLA and STELLAStack are trademarks of High Performance Systems. Mosaikk and SimTek are trademarks of ModellData A/S. HyperCard is a trademark of Apple Computer, Inc.

the following basic qualities: they must allow the player to learn the concepts that the model was designed to communicate; they must be easy to use and yet challenging; and they must be fun to play. For example, when I was asked to design a simulation model and interface for a computer exposition, I created a simulator that looked very much like a video arcade game. It had flashing lights, sound effects, and exciting warning and congratulatory messages sprinkled throughout. But embedded within the flashy exterior was an exploration of the dynamics of marketing—complete with a debriefing of the causal loop diagrams. The simulation was fun and exciting, but it also provided a learning experience.

Decision making vs. Policy making

In business, managers are constantly asked to make decisions, guided by company policies that govern various aspects of decisionmaking. For example, a manager may make ordering decisions weekly, but there may be a policy that requires the inventory level to always be above a certain minimum level. The manager exercises her own judgement guided by the policy of maintaining certain inventory reserves. Both Games and simulations are valuable for helping managers and policymakers gain experience by testing, failing, and retesting policies and decisions on simulated companies without risking real people and dollars.

From a modeling viewpoint, games support decision making while simulations support policy making. In a game, players must make decisions at the beginning of each and every round. Players interact with the computer period-by-period, allowing them to test innovative decisions and develop expertise in formulating rules for future decisions. In a simulation, users are asked to provide a set of policies at the beginning of the simulation. The users then watch as the effects of their policy deployments unfold over time. Through multiple simulations, they can test long term strategies and engage in scenario planning. They cannot,

however, interact with the computer on a real-time basis.

With the advent of recent interface design tools, managers can now create software interfaces that convert their system dynamics models into games, which can then be used as corporate learning tools. Currently, there are a number of powerful interface design tools that are compatible with models written in either STELLA or Professional Dynamo (see "Interface Software" box).

Games as Corporate Memory

Like traditional games, system dynamics-based computer games can be used to teach as well as entertain. Managers can use simulation games to make their "mental models" explicit and hone their decision-making skills. Games can also serve as "corporate memory" by capturing the important insights generated by a modeling project or other experience. Such

insights can then be passed along to new employees by allowing them to explore these microworlds. The game can give employees an overview of the organization, while at the same time helping them "bond" with the corporate culture.

Although you may not feel comfortable playing the "bloop, bloop" game with the CEO of an international corporation, games will continue to play an increasingly important role in preparing managers for the challenges of tomorrow. Let the games begin!

W. Brian Kreutzer is vice president of research and development at Gould-Kreutzer Associates, Inc., Cambridge, MA. He co-authored the second edition of Managing A Nation, a micro-computer software catalog, with Drs. Gerald Barney and Martha Garrett. He has designed a large number of software interfaces in conjunction with his consulting work. ↻

Systems Sleuth...



Continued from page 7

for incentives. The challenge remains the same: produce cars that customers want to buy, and there will be no need for incentives. Produce the "right" car and customers will even be willing to pay more than list price. The Mazda Miata, for example, was selling for 50% above its sticker price when it was first introduced, and Acura's new sports car, the NSX, is selling for thousands more than its \$60,000 list price.

Hunting Down Quick Fixes

The use of quick fixes is often necessary to remedy a situation that requires immediate attention. The trouble begins when that fix is inappropriately applied as if it were "the" solution for all problems. In the case of incentives, the real issue that needs to be addressed is why they are needed in the first place. Is the product unattrac-

Do Rebates Need Repair?

tive, not meeting customer needs, of low quality, or do customers simply need to be educated about it? Incentives are great for getting people to try a new product, but they only provide a sustainable competitive advantage to the lowest-cost producer.

Whenever a quick solution is suggested for a serious problem—especially in cases where it was used before—the best strategy is to find out why that fix is needed in the first place. Asking the question "what will eliminate the need for using the current fix?" begins the process of discovering the fundamental source of the problem and finding creative and lasting solutions.



Further Reading: Dertouzos, Lester, Solow, Made In America: Regaining the Competitive Edge, MIT Press, 1989.