Organizational Simulation
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Organizational Simulation
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Edited by
William B. Rouse
Kenneth R. Boff

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Modeling and simulation are not new. They have a long history from before modern advances in mathematics, computers and displays. People have been dealing with creative visualization, wishful thinking, counterfactual thinking, and "what if" for centuries. However, we have not had efficient and effective means to develop immersive environments with different organizational approaches, chains of command, and best practices. We currently develop a vision and a policy that looks good on paper; we implement it, experience the consequences from the new policy, and then make corrective changes over time. Organizational Simulation provides an enabling toolkit for people to view, analyze, and try to understand a current organization through interactive simulation, model the changes to an organization as a result of design and policy changes, and ascertain in this synthetic environment what effects, both intended and unintended, are likely to result from these changes.

The Department of Defense (DoD) has long used modeling and simulation technologies to develop interactive "worlds" and games to meet a variety of goals and objectives. These objectives include training and education of personnel; preparing and refining war plans; evaluating new weapon systems during and after research and development; analyzing military strategies and doctrine and tactics; and determining manpower and logistic requirements. The many broad applications of simulation technologies are constantly used to represent quantitative or qualitative states that depict something that exists or could exist in the real world. Given such use, the Defense Modeling and Simulation Office wanted to go beyond current employment of technologies and practices to examine individual behaviors of large numbers of people in different roles as they influence and are influenced by organizational dynamics, processes, and consequences. The project was termed Organizational Simulation or OrgSim. The goals of OrgSim are to help the DoD and the federal government identify, represent, and understand emergent organizational phenomena found in training, organizational structure, management, and policy. In its most mature form, OrgSim will offer new opportunities to study organizational dynamics before one invests in creating a structure to meet the intended function or goal of an organization.

This goal is quite significant as we view the changes in military and civil force structure occurring after September 11, 2001. As we go forward in the new millennium, the world has become increasingly unpredictable in its response to organizational change whether domestically or abroad. In the past, the United States military/acquisition organizational structure was geared to defeat a Soviet peer competitor. The Soviet structure, tactics, techniques, and procedures, along with the advances in technology, moved at a predictable pace and in an expected direction. Our doctrine, military, and organizational structure could change sufficiently quickly to adapt to the slow and often orderly changes to the Soviet
doctrine and capabilities. Our military industrial complex was well adapted to fight a large military nation state that had its own attendant slow changing bureaucratic structure needed to recruit, train, and equip its personnel. However, in the future, our forces will most likely be dealing with smaller groups and organizations of insurgents and terrorists who are much less predictable, harder to identify and track, and much more agile in the development of their counters to what we believe is our technological advantage.

The United States military will be dealing with combatants who will not be easily recognizable, who will not follow standard military practices, and who will draw our forces into unfamiliar urban environments. This will reduce our military’s overwhelming technological and mobility advantages in narrow streets among a population where the enemy can hide in plain sight within their urban organization. A major approach to defeat this enemy is to win the “hearts and minds” of the population within that environment by first being aware of them as an organization of people and cultures, and secondly accepting the unrestricted threats and how our and their organizations and cultures might adapt. The population can provide the human intelligence needed to distinguish friend from foe. But we still need the ability to model and simulate the relevant organizations whether for combat or for stabilization/reconstruction goals. This includes the full spectrum of military and political missions. Beyond the combat phase, it will take the coordination and cooperation of organizations such as the State Department, intelligence agencies, humanitarian organizations, charities, contractors and other nongovernmental agencies to gain the population’s trust and cooperation. This is an enormous organizational understanding and learning problem and challenge that requires our focus and determination to solve it. We need to ensure that we have (a) more behavioral and social data, as well as the means to make relevant use of it, and (b) basic research and theory development in areas such as decision-making, situation awareness, learning, and multi-organizational/multi-cultural modeling.

In the two decades since the Goldwater-Nichols Act of 1986, the military has been struggling to organize and work as joint, combined armed forces. It has been challenging because each military service has its own traditions, ways of doing things, and organizational structure. Getting multiple agencies with entirely different processes, traditions, and structures to work together effectively will be even more challenging. Modeling and simulation of future possible organizational structures and relationships are desperately needed.

In their organization and editing of Organizational Simulation, Bill Rouse and Ken Boff have brought together in one source an extraordinary collection of thought leaders who review and extend the present state of knowledge on the enabling technologies, methods, and tools for organizational simulation. Collectively, this volume offers new multi-disciplinary insights into potential roles of OrgSim, knowledge of individual and collective behaviors, and alternative approaches to modeling these behaviors. A variety of fascinating simulations and games are highlighted in this book, clearly illustrating the capabilities and limitations of what is already possible. We expect that this volume will be an
invaluable resource for students, scholars, researchers, developers, and policy makers in the modeling and simulation community.

Paul Chatelier
Michael Lilienthal
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PREFACE

ORGANIZATIONAL SIMULATION
From Modeling and Simulation to Games and Entertainment

Edited By
WILLIAM B. ROUSE AND KENNETH R. BOFF

This book took over two decades to come together. It began when we studied the
design of complex systems and observed many aircraft designers from several
companies wrestling with difficult design issues. It was nurtured by working with
executives and senior managers in a wide range of private and public sector
enterprises. We were often asked something like, “Wouldn’t it be nice if you
could drive the future before you wrote the check?”

That possibility was not unreasonable if you were designing an airplane, but
what if you were designing an airplane company? What if you were designing an
air force? What about a university? The overarching question is how to
experience and evaluate substantial organizational change before committing to
investing in making it happen.

Along the way, we were motivated by Apple’s Knowledge Navigator in 1987
and Sun’s Starfire in 1994. The capabilities presented in these technology visions
were compelling. However, the technology in those times was not up to the task
of supporting the organizational simulation (OrgSim) we had envisioned. What
could be done would be very time consuming, very expensive, and not very
compelling.

More recently, with the Internet, online games, and picture-like computer-
animated movies, our appetites for OrgSim have been whetted. We are now
convinced that many pieces of the puzzle are available, despite the fact that the
picture on the puzzle box is not yet clear. It is also obvious that there are now
many more disciplines, and hence more talent, intrigued by the idea of OrgSim.

We resurfaced our vision in a white paper in early 2003. The Defense
Modeling and Simulation Office was intrigued by this vision and committed
support for conducting a Workshop on Organizational Simulation in December
2003 and partial support for subsequently compiling this book. We are most
grateful for DMSO’s support, without which the workshop and this book would
not have been possible.

We are also indebted to the participants in the workshop and the authors of the
chapters in this book, many of who were involved in both activities. We feel quite
fortunate to be able to draw upon the “best and brightest” from modeling and
simulation, gaming, and entertainment, as well as leading thinkers in behavioral science and computing.

The promise of organizational simulation is immense. OrgSim can enhance what we do now, e.g., in design and training, and enable new ways of working. Strategies can be deployed and evaluated in OrgSim so that designers and investors really can drive the future before they buy it. Similarly, people can be trained to operate in a future that does not yet exist. There are also obvious entertainment opportunities. Perhaps the synthetic characters that act in OrgSim can become actual workers, staffing call centers and providing expert advice in a variety of domains.

We are convinced that this range of capabilities will eventually be available. It will happen slowly, over decades, if the natural evolution of the various disciplines involved proceeds as usual. Or, it could happen much faster – less than ten years – if research investments of sufficient magnitude are targeted at a well thought-out portfolio of challenge problems. This is, of course, what we advocate.

This book is the principal product of a project sponsored by Captain Michael Lilienthal of the Defense Modeling and Simulation Office. Mike has been an unwavering supporter of the OrgSim vision, providing financial and conceptual assistance to move this vision to reality. Of equal criticality to the success of OrgSim, in all phases of the project, has been the energetic intellectual engagement of Paul Chatelier, a senior technical advisor with the Potomac Institute for Policy Studies.

The authors are also grateful to Veridian (now General Dynamics) for their highly effective support in the planning and administration of the OrgSim Workshop. Scott Blevins was our onsite IT/computer professional who orchestrated and installed a highly effective wireless intranet that facilitated collaboration among workshop participants. Dr Tom Hughes, a cognitive engineer, helped facilitate the workshop process and made important contributions to documentation of the proceedings. Our sincere appreciation also goes to Jodi Nix and Renee Blanford who played heroic roles in the planning, coordinating and on-the spot troubleshooting that were vital to achieving the goals of the workshop.

Finally, we are very pleased to acknowledge the assistance of Kristi Kirkland of Georgia Tech who served as managing editor in bringing together and integrating all of the elements of this book.

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