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COMPUTER-BEHAVIORAL SIMULATIONS TRAINING FOR PROJECT MANAGERS

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ABSTRACT

Business organizations have historically been slow to invest in and fully adopt the project management concept. The normal process for implementing a project management is to select or standardize on a project management software package, without commitment to the necessary training to implement the proper concepts and systems. In other words, the technology is adopted, but the work patterns and the support systems are not changed. With this approach, the investment to automate project management is bound to create more problems than it solves, especially if the same investment is not made in the people who are to use it.

The reality is that most project management environments are very complex; and, a new companion reality must teach people to manage this complexity not to minimize it with simple models, statements, or techniques.

For project management to be effective, changes must hit the organization at all levels - powered not only by new technology and information, but directed by a clear vision and purpose. The changes must not only be driven by top management, but also by the project managers themselves. Project managers need to actively implement the project management philosophy and concepts. They need to view project management as not only a set of tools and techniques, but as a "frame of mind."

Today, there exists a highly sophisticated, and complex computer-behavioral simulation that replicates a hypothetical project. Participants take-

over and manage a real life project right in the classroom. They must apply management skills effectively, i.e. planning, scheduling, control, problem-solving, etc., along with demonstrating effective application of team leadership skills, i.e. conflict resolution, negotiation, team building, influence, etc.

This presentation and "hands-on" experience will highlight the twenty years of research, design, development, and modification efforts to develop the model; and, trace the evolution of the original design effort with a focus on the problems and solutions. The overall goal being exposure of ABSEL members to a very robust and sophisticated computer simulation for teaching project management skills.

WHAT IS THIS SIMULATION AND, THE REASONS FOR ITS USE? HOW DOES IT TEACH?

First developed in the late 1970's, the Project-Leadership Simulation has been experienced by over 50,000 participants from over 100 different organizations in various industries (including Merck, G.E., NASA, Lockheed-Martin, EDS, Nortel, USAA, Prudential Insurance and the U.S. Navy) and evolved into a very comprehensive and interactive experience with new features being continually added. Since it centers on projects, it is exceptional for organizations with practicing project staff, but can also be worthwhile for graduate students in any technical discipline.

A simulation's strength resides in the participant engaging in a realistic representation of a real-life environment. Correspondingly, once assigned to a project, participants experience a level of uncer-

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tainty and ambiguity which creates an appropriate level of anxiety and creative tensions. They even have to accept seemingly impractical constraints from their “management.” The simulation’s life-like feel comes from its use of standard project management techniques, such as a project scope, work breakdown structure, milestones and resources allocation.

A team’s first 8 to 12 hours is spent building a defensible project plan which defines the scope, risk, and priorities (time, cost, quality, personnel). Project planning software is built into the simulation for use in calculating budgets, schedules, and staffing.

The next 12 to 16 hours are spent implementing the plan and controlling the project. When the simulation triggers any of the hundreds of possible “real” problems, participants immediately forget that this project is not real. Tracking project progress and communicating status, important to project management, is done on a “weekly” basis in this simulation.

To successfully accomplish a project, it is critical to have a high-performing team of people. Thus, simulated human performance proves to be a critical factor in reaching the objectives.

Further enhancing the realism of the simulation are:

- constant tradeoffs among the factors of cost, schedule, quality and personnel.
- a continual need to re-plan quickly.
- communication and interaction with the simulated project staff, vendors, consultants and contractors.
- dependence on an elaborate project management information system.
- typical project problems such as absenteeism, staff diverted to higher priorities, design prob-

lems, technical problems, changed customer requirements, personality conflicts, overstaffing and resignations.

The instructor can change the simulation’s decisions and parameters in order to constantly challenge any team’s performance, mimicking a real organization’s specific culture, policies and procedures. Participants are encouraged to think “outside-the-box,” to challenge the systems, and to justify the pursuit of creative methods of accomplishing the work.

Learning occurs in four distinct areas:

- Project integration skills: THE PROJECT LEADERSHIP SIMULATION places the participant in a complete project environment. By avoiding the artificial isolation of working with one skill at a time, they work with and observe the interrelationship of problems. Solutions lead to greater insights and understanding of complex systems and relationships.
- Team management skills: This simulation provides an environment to explore team-building methods in a relatively risk free manner. In an atmosphere free of criticism and evaluation by higher management, teams work through the steps of effective team development while encountering problems similar to those faced by real teams. Because they see the immediate results of their corrected decisions they remember the lessons.
- Project management fundamentals: This simulation provides practical, repeated practice in the use of project management principles, tools and techniques.
- Performance under pressure: The simulated risks create situations to perform under life-like business pressures. The duress created by the uncertainty of the results makes this a very real experience.

SIMULATIONS’ DEVELOPMENTAL CHALLENGES AND PROBLEMS

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Early advocates of management simulations training tried to convince skeptics that simulations were not just classroom stunts, but effective learning vehicles, and in many ways more effective than traditional classroom lectures, role plays, and case studies. However, there were very good reasons why the skeptics avoided simulations in the old days:

- Early simulations were run on mainframe computers, creating administrative nightmares to get the simulation running and receive timely output without interruption.
- Software was difficult to use, and very often poorly written.
- Simulation documentation, when it existed, was not descriptive of the simulation and merely consisted of game rules with mathematical formulas. The rules left participants with the impression that they were playing a large-scale, number-crunching, management game. Many times the information contained on the simulation reports did not make a lot of sense.
- Instructors were typically “game administrators,” which meant they helped trainees understand the game rules and the computer input routines. The game administrator was often kept busy just interpreting the rules of the game or the simulation outputs.
- Workshop designs were dominated by the simulation dynamics, without concern for the learning outcomes the simulation supported. The instructor focus was biased toward the simulation details, rather than the learning objectives and workshop design.

WHERE WE’VE COME/THE PRESENT STATE

Considering all these problems, one might ask: Why did organizations continue using simulations? The answer to the question is really quite simple: Because even with all the distractions, people still reported richer, deeper insights than provided by more traditional teaching methods. After more than three decades since the appearance of the first computer-based management simulations, major developments and significant contributions have changed the growing field of simulation-based training, including:

Better hardware and software. New technology has made it possible to accomplish now what one could only dream of less than 15 years ago. Simulations are much easier to use now thanks to user-friendly software and the availability of powerful desktop hardware.

Richer, more robust simulation. Simulation designers sharpened the focus, became “smarter” about how to work with this newer training technology, and now create more realistic simulations suitable for the classroom. Designers now develop simulations that demonstrate business and project dynamic relationships and eliminate the cumbersome details that present distractions to learning. This makes the simulation easier to learn, providing a sense that trainees are managing a real project, and away from the mentality of playing a large-scale number-crunching game.

Integrated learning designs. In the past, the simulation dominated the learning design. Now, specific content, concepts, and principles are introduced throughout the experience by traditional methods such as lecture and discussion, video, group exercises, personal instrumentation, small cases, role plays, etc., and the simulation is used as the vehicle to practice and apply skills.

Better facilitation. The development of more robust and “friendlier” simulations frees the instructor to do more teaching. The instructor now has many varied functions in the workshop: (1) lecturing on key topics, (2) facilitating the team process, (3) playing the role of the boss or customer,

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(4) facilitating the simulation debriefings, as well as (5) managing the simulation and workshop exercises.

Richer, deeper learning outcomes. By no means last in its importance, the customer—trainees and their managers—receive higher quality, more realistic training in many different skill areas. They are now freed from learning cumbersome simulation mechanics and mathematics, to learning what has meaning and relevance for their jobs as project managers.

THE REAL AND UNREAL IN A PROJECT MANAGEMENT SIMULATION

At the beginning of the exercise, the simulation introduces a tolerable level of uncertainty and ambiguity to create an appropriate level of anxiety and creative tension in the participants. The project team makes assumptions and judgements based on partial information. The challenge they encounter generates excitement levels because it feels and appears like a real project, and becomes the basis for their total intellectual and emotional involvement in the exercise.

One of the simulation's many characteristics that makes it feel "life-like" is the presence of a project definition, work breakdown structure, milestones, and task definitions. The project must be planned within the cost, schedule, and quality constraints provided by the instructor. Several other attributes that enhance the realistic quality of the simulation include:

- Existence of simulated people with personalities, skills, salaries, availability, vacation schedules, personal work preferences, and other morale factors that make them lifelike;
- Existence of tradeoffs among cost, quality, schedule, and people;
- Use of vendors and contractors to support full-time staff;

- Presence of unexpected events which can periodically disrupt the project plan and create the need to re-plan quickly;
- Existence of project status meetings and other project communications;
- Existence of project management control information including schedules, resource histograms, project metrics, bar charts, network diagrams, financial baselines, hours and percent complete baselines, people reports, and control and tracking reports. The simulation is also programmed to link up with commercially available spreadsheets and the participants have the option of creating more control charts and graphs to track the project's progress.

The large number of issues contained in the simulation make it a rich information project environment. Rarely do participants attend to all the issues that they might want to if they were given unlimited time to participate in the simulation. As a result, participants must learn to manage the information needs, balancing the large picture vs micro-managing details. The simulation has realistic time pressures and provides an ideal context for studying the team's process in handling the project's issues and problems. What issues did the team find most important? What key issues were ignored? How well are they working together as a team? These are examples of some team process issues we will now address in this presentation's practicum.