



Learning to Lead, to Create Quality, and Influence Change in Projects

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Introduction

A continuing challenge is teaching the craft of any profession. In project management, we rely on a combination of self discovery and apprenticeship to teach the craft of managing projects. Ultimately, a new project manager learns by observing, by being coached, and by doing.

The paradox still exists: How to produce a mission capable project manager in a relative short time. Project managers are anointed overnight with little attention given to prior skill development. These skills are paramount because three of five crucial developmental assignments in executive growth are projects.

We learned from the quality movement that a deep understanding of the processes leads to quicker learning and more consistent results – accomplishing the processes is mission capability. Project management has been aided by documentation and dissemination of successful functions but this addresses only a portion of the craft to be learned.

As with any complex craft, the selection process for new generation project managers is inhibited:

- by the lack of dedicated practitioners willing or able to act as coaches and mentors.
- by the scarcity of opportunity to personally observe poor as well as good examples of project leadership.
- by the time lags in projects that decouple a clear connection between cause and effect.

The result, as with teaching other crafts, of our informal apprenticeship programs is to teach a culture better than a craft.

The authors have developed a series of focused short interval simulations to provide multiple laboratory experiences for learning key integrated project skills. Join us on the journey of becoming a mission capable project manager.

The Challenge

Through the design and incorporation into course materials of a series of experiential model building simulations, we have increased the effectiveness and intensity of project management training. These simulations are cost effective for groups, use readily available technology, and automatically involve all participants in the course.

The participants experience a wide range of project processes, in an environment where they directly experience the impact of team effectiveness. They can see immediate results from investment in team building and work through the consequences of their shared decisions. During the course of the simulations, varying leadership and project control strategies are tested in a marketplace of ideas. The benefits and pitfalls of alliances and of building relationships become clear.

We have used experiential simulations with contractors, project management professionals from varying backgrounds, a major corporation's central engineering group, and partnering sessions with government officials and contractors.

The challenge of project management training is to accelerate learning the craft – something not normally possible “on-the-job.” The mechanics of the craft are relatively easy to learn – we sense that scheduling is perceived by many to be project management. Scheduling packages are always a hot topic at PMI meetings. The art – the craft itself – is far more difficult to learn, to internalize and then to apply.

We believe there are three skills in that craft – the black art: leadership, creating quality, and influencing change. These are tough to teach, much less learn. Like selling, schools do not teach leadership – instead they offer marketing and organizational behavior. Quality is taught statistically – quantitatively but not qualitatively outside courses like analytical chemistry. Change control is preached but only the books on crisis management² approach any aspect of influencing change. Change happens with or without control. We can influence but never actually control change, not unlike the way California controls earthquakes. The effect, not the affect, is mitigated.

Learn To Do Without

There is however, a profession that addresses all three – the military – the profession of arms. The military, more so than any other organization, practices or rehearses its craft.³ People and organizations are forever training to accomplish hypothetical missions. Experience (making mistakes) is obtained in a thousand ways without “seeing the elephant” – actual combat experience.

Command post exercises, field maneuvers, battle drills, live fire, logistical exercises, training exercises without troops, terrain walks, staff rides, sand tables, map exercises, war gaming are but a few of the ways experience is obtained. What do we in project management do that is comparable? How are change, quality and leadership integrated and internalized? How will we intuitively respond to the “fog” of battle during the project?

In human endeavor, project management and war have much in common. Moving resources to achieve objectives is nearly identical to moving units to achieve military objectives. We can learn much about project management if we look at the folks who literally live and die by



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project management. The real project environment is a harsh world – mistakes are rapidly punished, messengers are shot, and blame placed everywhere else. These are the casualties – and often as traumatic as a wound in battle. How do you accelerate the learning curve and make the learning less risky? What is more important, how can we change values and behaviors so the project terrain is less dangerous and more nurturing? How do you teach different or new concepts such as Total Quality Management?

The answer is in **simulations** – war games. Chess is a war game that has become a part of⁴ the human psyche. War Gaming kept several German Generals out of the Normandy Invasion.⁵ An early commercial war game proved the Gulf War would only take four days before it began.⁶

Project managers use simulations already. The ever present critical path technique (CPM) is a simulation.⁷ Using this static technique to simulate the dynamic project forces project managers to build the project on paper before it is built on the ground. The process of doing in private before doing in public helps the team learn the project, the issues, the goals, the relationships before ever beginning the project. The CPM then becomes a control tool – actually a resimulation device where the logic, the reality, the progress, can all be revisited and reworked – before it happens in real time.

What benefit do simulations have over other forms of training? Project management courses can be dry, lecture intensive learning environments. The best environment is to learn while under “fire.” People learn project management skills on the job – learning by doing. Adults learn by doing, by struggle, by evaluating good and bad actions.

SIDE BAR 1 **Project Quality Improvement**

In the first application of this technology, a series of simulations was employed to provide experience in the TQM concepts of continuous improvement as applied to project management. The exercises were performed within a construction company by teams of employees from throughout the organization.

In this set of exercises, eight teams competitively built three successive models over a period of weeks. Scoring was published as each round was completed. Scoring was cost based with costs incurred on materials, planning time, construction time (at a different rate) and the cost of optional services obtained from the facilitator. The exercises shared technology and ground rules but were distinct exercises.

In common with construction processes generally, the key to success was in recognizing and improving the core processes common to the projects. No one project allowed for a sufficiently detailed plan to optimize fully for those aspects unique to the specific project. Team effectiveness grew markedly across the course of the three exercises.

In the scoring of this set of exercises each team improved on each repetition from their previous performance. This improvement culminated in the best team performance requiring approximately one-tenth of the time required for that team’s original performance. The winning team split a prize of \$100.00.

Of interest to report was the result of using a modified simulation in a superintendents’ meeting. In this use, four performing teams were each seeded with one person, in each case a young engineer, who had participated in the previous contest. Every team ceded leadership to this experienced person. The “experienced” leader then helped his team produce a very poor estimate of their cost of performance, resulting in an unprofitable contract. Seemingly these young, strongly task-oriented engineers remembered their previous simulation experience more clearly in terms of the final score. Forgotten were the lessons of effective planning and team building by which they earned that score.

From these experiences we developed an ice breaking simulation that has been used many times.

Invariably this exercise results in opportunities to observe good and bad team interactions. We observe planning efforts to receive lip service but no effective effort. The teams usually are inefficient in the employment of resources, waste considerable time, and suffer the impact of haste or of selected strategies that prove ineffective.



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Simulations do accelerate learning – consider the Apollo project without the thousands of simulated practices. The project cycle times can be reduced so people can become excellent managers sooner by experiencing many cycles of learning. We believe that simulation – a make believe reality – is the tool to increase the efficiency of the learning environment.

Simulation Creation

Our original model building application evolved as an approach to teach the total quality management concepts of process improvement to construction people. We developed the idea from an experience twenty years earlier with a simulation,

Lego®MAN.⁸ A single purpose simulation that taught the value of investing in teams and a mission versus investing in a person with a job function. We continued to explore and to develop simulations that greatly enhanced learning, leadership, quality and change.

We searched for supplementary means of modeling project team interactions that would build on shared experience and use experiential learning for project managers. We experimented with model building processes as models of project interactions. The technology as developed proved successful in providing learning situations where participants can view project processes in an understandable context.

Teams are formed and given problems to solve. The problem is constrained by a time frame and, as appropriate, by a cost structure. Depending on the objectives set, focus can be developed on **intra-team cooperation, inter-team cooperation, inter-team competition, team building, decision processes**, recognizing the reality of or maximizing the effectiveness of **project overhead, project control systems, project process improvement, effective delegation**, or the **interface of teams** simultaneously working on separate aspects of the complete problem.

On Learning

Our commitment to simulations comes from the study of teaching. We discovered Malcolm Knowles,⁹ who founded the concepts of how adults learn and an adult learning process. The adult, and even a child in many situations, learns best by doing – by struggling. The adult learns best from peers rather than instructors. An adult – unlike children – will only learn when there is an immediate need – “Just in time learning.” Adults have a strong need to apply what they learn immediately. They are not patient to learn things for which they do not perceive an application. The teacher becomes a facilitator; the student is responsible for learning.

In additional leadership studies,¹⁰ we learned that the mind cannot differentiate between reality and fantasy. Psychotherapy has techniques to “change history,” to relieve issues with a past cause. People can learn important lessons in an analogous environment – a metaphor.

We used a successful metaphorical learning methodology¹¹ to accelerate strategic planning by taking an imaginary fishing trip or golfing vacation and relating the planning and execution of that trip to the business issues at hand. The creative forces released, rapidly identified and addressed business issues consistently and with

SIDE BAR 2 Learning Criteria

We believe that the mind cannot differentiate learning in a metaphor from learning in a “real” environment. Simulations accelerate learning from experience by providing access to repeated cycles of learning.

Learning must be applied to be adopted. A learning environment that encourages experimentation and provides immediate response leads to more effective application of lessons in “real” situations. The simulations provide this fail safe environment and build confidence for application of tools mastered.

Simulations have been structured to meet criteria we believe accelerate learning:

- ◆ Adults learn by doing. Each Simulation is a team-focused activity.
- ◆ Adults learn when fully engaged. Simulations employ all senses in what universally becomes a very intense experience.
- ◆ Adults learn by struggle. Each simulation incorporates trial and error.
- ◆ Adults learn from each other. The simulations maximize individual learning through shared experience.



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clarity. The sixth sense construct unleashed tremendous creativity, high quality results, and long retention of the experience.

People do not have to be in the same environment to learn valuable lessons that can be applied in other settings. Nor do they have to address the same technical projects to learn project management skills. Later we learned that Edward de Bono¹² used metaphors in his creative work – fantasy that can be stepped into and lived – like the “holodeck” on Star Trek.

Growing Project Managers

The age-old question of whether a skill is inherent or acquired is still encountered concerning the skill sets of project managers. Sponsors now recognize that project managers are grown, not born. This has increased the effort directed at finding economical and effective training methods, as a means of transferring knowledge and developing skills.

Training of project managers is complicated by the diversity, scope and complexity of the real life situations with which they are expected to cope. This brings imposing difficulty to the issue of building effective training models within the scope and complexity limited by practicality.

Experiential model-building simulations provide immediate reactions and the opportunity for multiple cycles of learning in a short period of time. By providing a shared experience base for all participants, identification of the application of concepts developed to real projects is often instantaneous.

SIDE BAR 3

PROJECT TEACHING MECHANISMS

The first attempts at using these simulations followed the recognition that all means of training in specific aspects of the project management have their place and limitations. Lecturing can be excused as a cost-effective way to convey standardized information to an audience. In practice it works better as evidence of having given the instruction than as a means of affecting behavior.

Computer simulations make great scorekeepers, quickly projecting the impact of specific decisions and allowing exploration of alternate strategies. Reportedly an oil company was so impressed by the training opportunities they observed in SimCity® that they commissioned the designers to build a computer model of refinery operations as a training tool.

Computer models poorly model the team process involved in reaching decisions. These models often place an understanding of the technology (of computers) ahead of learning the lessons sought.

Case studies can provide a means for sharing experience in the reaching of decisions but do a poor job of modeling the impact of decisions. They lead to decision review in a very detached, academic manner, again failing to model the processes of team decision making.

Business Week reported using **Legos®** to train teams in production changes in a GM European plant.¹³

Our Learning

What have we learned using experiential model building simulations?

- ⇒ Behaviors (project management types tend to be detailed, accounting, hard working) are replicated inside the simulations that were learned outside. People use behavior that led to prior success. Behaviors mirror project management styles – people do in the simulation as they do in real life.
- ⇒ Participants have to be reinforced, reminded, encouraged to try new ways – to employ recently learned concepts. People will try on new behaviors if the environment encourages and protects the testing.
- ⇒ Generally people in projects and simulations want to complete the problem and not look at underlying theory nor evaluate the experience to explore what they might have learned. They just want to get done.



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SIDE BAR 4

PROJECT MANAGEMENT REALITIES AND SIMULATIONS

The experiential model-building simulations are well adapted to project realities. Through the exercises the following realities are reinforced and internalized:

Projects are a people business. Behavior in simulations mirrors real world behavior of participants. Changed behavior within a simulation will bring changed real world behavior.

Relationships are the key to success in projects. The use of simulations emphasizes team building, cooperation, collaboration, and listening – particularly to the users, sponsors, champions.

Projects run by communication. Simulations focus on requirements for clear communication (written and verbal) in understanding expectations, processes, goals, objectives, designs, and success criteria.

Effective planning pays. Emphasis on planning helps to realize the tenfold payoff in project management for effective planning. The dimensions of strategic, tactical and operational planning are better understood after working with the concepts. Successive simulations develop complex planning skills.

Time is a perishable resource. Emphasis on time limits in simulations develops understanding of using time effectively.

Projects are won by processes. Many processes contribute to project success: logistics, procurement, risk management, performance contract, time organization, cost accounting, knowing, seeing the process, measuring results, challenging the system, using the process creates project success.

Leadership embraces the project. Every word, every day influences the people of the project. What needs to be modeled, what empowers, what keeps people caring? Use the key skills of a project leader to develop teams, nurture people, and grow customer satisfaction. Simulations allow newly acquired leadership skills to be practiced in a “failsafe” environment.

Learning and improvement must be perpetual, both within and between projects. Debriefs, planning, tool deployment and skill building all stress continuous learning. Learning is accomplished by individuals and teams. Organizations advance through the collective learning of individuals and teams. Simulations require practice and model continuous feedback and learning. Teams learn to learn to improve quality continuously.

- ⇨ The metaphorical aspect appears to show that the creative types learn faster – the practical types have varying levels of difficulty getting inside the simulation. The “right brainers” have more degrees of freedom in being able to live differently.
- ⇨ Teams do not just happen – throwing folks together does not make them a team. Teams must be built. Projects simulations can help build teams.
- ⇨ Teams form strong bonds and resist being broken up – they want to perform well together. They would rather stay together than learn new people.
- ⇨ The reality is the known is safer than the unknown.
- ⇨ The creative juices begin to flow; the brain is freed up; the power of fantasy is valued. Learning is actually fun – the lessons embed in the subconscious because the conscious is enjoying itself.
- ⇨ There are at least four or five kinds of project environments; projects are not all the same even within an industry. The industry specific groups typify this. Metaphorical simulations allow people from different backgrounds to learn together.
- ⇨ Complex processes and interactions such as a micro-economy can be effectively modeled in a short time frame. These simulations bring real world issues into the learning situation. Participants confront competing agendas and must satisfy others to successfully complete projects – in a few hours.



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⇒ People remember the simulations and the underlying messages. Weeks later they spoke of the experience and its lessons.

We learned that **one simulation cannot be all encompassing**. Skills can be taught and reinforced by short quick turn around exercises. A single simulation can teach three or four skills. Even though the actual exercise may require ten or twelve skills, only a small set should be emphasized. We have pondered running the same simulation a second or third time; people are amazingly quick learners. They are able to be successful and they learn the rules of the game. We prefer to move people to more complex simulations comparable to real life experience where they have to figure out what they learned, what is pertinent to this challenge, and how to apply that learning.

The most effective teaching occurs when each exercise results in an **after action review** of the exercise, **tailored to specific course goals**. The feedback on the skills shown is typically used as an introduction to specific project processes. For example, the planning failures of a first exercise can lead directly to instruction of effective planning methods.

An After Action Review is a powerful means of learning from doing. We learned that we could change the focus of the simulation by what questions we asked in the debrief – or by changing the preceding lessons. The **objectives of the learning need to be defined** and the debrief follow those objectives. It is essential that the lesson and the debrief be aligned.

A further adaption of the technology is currently in use on a division-wide basis in the engineering department of a major manufacturer. {See pmNET, September 1994} Here it is being used to help in training of upgraded project skills for

project management and engineering personnel. In this organization four simulations are used in a week-long course culminating in a four-hour simulation of a micro- economy involving team roles as owners, suppliers, engineers, and contractors.

A common theme for all the simulations is the use of a team approach to build organizational effectiveness while efficiently accomplishing the goals of the project. The simulations have proven very effective to point out the faults of project managers who too often attempt to excuse inefficiency and ineffective team action. The universal attempt to excuse such behaviors in the name of deadlines and budget constraints is demonstrated as futile.

Experience with the simulations has shown that, just as in real projects, **effective approaches to organizational process management yield the best long term project results**. This conclusion is not self evident to project participants, but through the effective use of targeted simulations the lesson is absorbed.

Another consistently observed phenomenon is the **disproportionate impact on project process of minor changes**.

Participants must learn quickly to get their hands around change or they get eaten alive. One experience had an engineer dominate the simulations with negotiations for payment for minor change. When that change was granted, the group lost all creativity because of the increased time pressure – they disintegrated. In general, the impact of minor change is devastating to inexperienced teams.

Simulation methodology can be readily adapted to obtain effectiveness in teaching many project management processes. Direct examples can be drawn to help in teaching many processes such as: team

formation, team building, effective planning, work breakdown structure, scheduling, estimating, scope definition, and incorporating project controls systems. Experience has shown this effectiveness in many environments. The simulations used to date are sufficiently generic to have found general applicability, with adaption, to many project management environments. The models have been adjusted to the needs of a variety of specific projects or performing organizations.

Summary

Simulations have been used for many years to enhance professional crafts. Aircraft simulations have a long tradition now enhanced by computer aided simulations aimed at teaching skills as varied as truck driving, extra-vehicular space walking, and stomach¹⁵ surgery.

The craft of project management can be learned. The author's experience shows that well designed, small scale, project simulations can focus teams and individuals on learning critical project skills within days.



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