white paper

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Performance Simulation: Developing Your People to Build a World Class Supply Chain

Senior executives are increasingly aware of the fact that the best market strategies and technologies ultimately depend upon human performance – on how well the workforce executes. Attending to this component of any change effort can significantly accelerate the benefits and sustain the business results derived from the most significant investments. Performance simulation provides a simulated environment in which individuals have the opportunity to practice making critical business decisions in a risk-free environment. The hands-on and rapid learning pace of the simulator accelerates their time to competency and ultimately maximizes the value the business can capture. This article describes how these cutting-edge techniques can significantly improve employee performance.

Consider the global financial services company that realized more than $100 million annually by avoiding unfavorable deals and making sound financial underwriting decisions. Or an industry leader in engines for general aviation aircraft and space propulsion systems who realized $400 million to 500 million in annual additions to net income by improving the quality and speed of decision-making by top managers and knowledge workers.

Understanding Performance Simulation

Like flight simulators that allow pilots to practice flying without risking damage to themselves or their planes, performance simulation provides a simulated business environment in which to test the impact of critical business decisions, and gives individuals the opportunity to practice making these decisions in a risk-free environment. The effectiveness of performance simulation derives from a number of carefully developed characteristics. Employees are provided with:

• A virtual environment that looks and feels like their workplace
• Opportunities to make decisions and experience the consequences – they learn by doing
• Real goals to motivate the learner to complete the tasks and activities

• Realistic outcomes dependent upon specific actions and strategies
• The freedom to make mistakes within a private and safe environment, which is essential to real learning
• The ability to take charge of their own learning and proceed at their own pace
• Expert advice provided through real-life stories
• Personalized coaching and feedback

These characteristics combine to generate a rich learning environment that provides employees with the support and guidance they need to fulfill realistic workplace goals. Individual measurements provide the feedback to motivate employees to continue practicing until the desired level of performance is achieved.

Improving Job Performance

Before considering the success of such a new educational approach, it is first necessary to assess the success of existing forms of training. A recent Andersen Consulting study highlighted four problems with traditional training approaches:

• Organizations fail to evaluate the impact of training.
• Training programs are frequently devised and implemented in a piecemeal, non-strategic manner.

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- Corporate and technological changes are driving a sustained growth in training activity.
- Poor quality training is worse than no training.

Whereas traditional teaching is governed by an instructor and geared toward remembering facts, an effective learning process should be controlled by participants and focused on applying knowledge, skill, and judgment. With the content shaped by the context rather than disassociated from it, performance simulation is driven by outcomes and goals, and it relies on demonstrated performance as the confirmation of competence. In short, what is needed is the business equivalent of a flight simulation.

When compared to traditional forms of training, performance simulation significantly improves knowledge and skill retention (see Figure 1.0). For example, in terms of retention, performance simulation's 75% retention rate outperforms all forms of training except "teaching others," which has a 90% retention rate. Other forms of training have significantly lower retention rates: lecture, 5%; reading, 10%; audio/video, 20%; computer-based training, 30%; and discussion group, 50%.

In addition to improving retention, performance simulation also increases job performance. Employees at four Andersen Consulting clients experienced an average retention score increase from approximately 40% after traditional training to 65% after performance simulation, which had a significant impact on their job performance.

In many cases, even a small but measurable improvement in job performance can offer significant business benefits. A clear example is the global soft drink company that realized more than a 10% increase in their customer satisfaction survey results, a result of improved employee behaviors and interactions with customers. In such situations the initial capital cost of performance simulation development is quickly repaid through improved business performance and reduced cost of training delivery.

Applying Performance Simulation

Performance simulation is so versatile it may be applied to a wide variety of working environments to teach employees of all skill levels how to make better business decisions. Environments in which simulators can bring benefit are grouped into three broad categories: (1) low complexity/high volume, (2) medium complexity/medium volume, and (3) high complexity/low volume.

A low-complexity/high-volume situation is defined as having large numbers of employees who perform relatively simple tasks. This environment often requires an enormous training expenditure. Consider a U.S. fast food chain with an annual turnover of 30,000 employees and average retention of just two weeks: three days of those two weeks were spent in training. With a computer-based performance simulation that resembles a computer game in which customers are served as they enter a simulated fast food restaurant, time to competency was reduced from three days to two hours.

In medium-complexity/medium-volume situations, customer service representatives in industry sectors like utilities and telecommunications require rapid and effective training to handle inquiries about new products. In the case
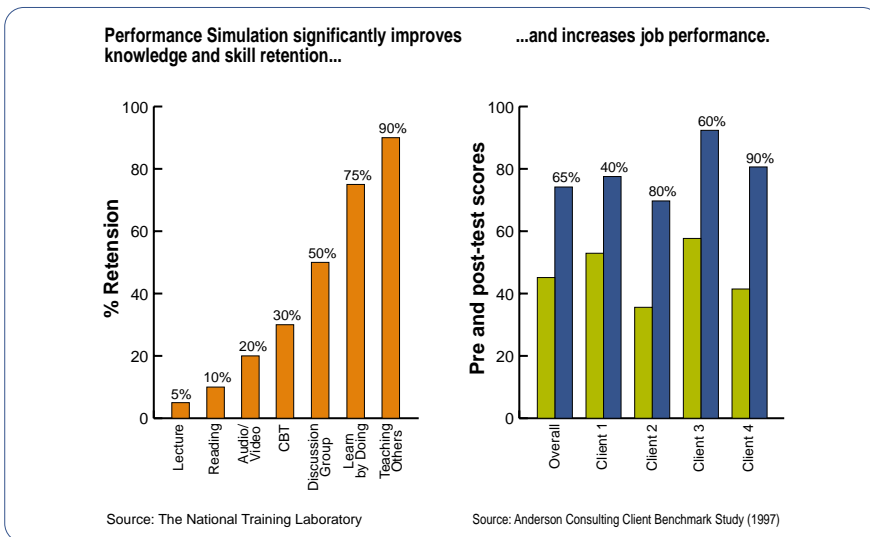

An Andersen Consulting Study

An Andersen Consulting study completed in June of 1997 analyzed the training operations of more than 100 large companies in the U.K. and provided four key findings:

Organizations Fail to Evaluate the Impact of Training
Despite increasing expenditures on training, there is little evidence that the value of this investment and its effect on human performance is being systemically measured. Nearly one-quarter of firms surveyed conducted no formal measurement, relying instead on vague assessments of the relationship between individual performance and corporate benefits. As long as training programs are assessed on the basis of input rather than outcomes, they have little chance of achieving their full benefit in terms of using resources efficiently, motivating staff or maximizing business success.

Training Programs are Frequently Devised and Implemented in a Piecemeal, Non-Strategic Manner
In 60% of the companies surveyed, the task of identifying training needs was normally left to the line managers, with the human resources or personnel director becoming involved in only 27% of the organizations. While local managers are best positioned to assess short-term performance needs, this should be complemented with training driven through close alignment with organizational strategies.

Corporate and Technological Changes Are Driving a Sustained Growth in Training Activity
Approximately 61% of the organizations that took part in the survey predicted an annual increase of five percent in training budgets. The main reason given for increasing training expenditures was to ensure that employees could keep pace with sophisticated new technology, such as computer software, specialist tools, and enterprise resource planning systems.

Poor Quality Training Is Worse Than No Training
Experience suggests that when training and development fail to match participants' expectations, the effects are likely to be de-motivating, and, therefore, potentially harmful to the organizations they represent.

Performance Simulation significantly improves knowledge and skill retention...

...and increases job performance.

Source: The National Training Laboratory

Source: Anderson Consulting Client Benchmark Study (1997)

Figure 1.0 Performance simulation significantly improves knowledge and skill retention – and increases job performance.

of one large U.S. telecom company, these customer service representatives would normally spend up to two days a month off-site learning about new products. This enforced absence was reflected in declining customer service ratings. With an intranet-based performance simulation program that employees could access through their computers to simulate the inquiries they were likely to receive from customers, 1,500 customer service representatives were able to be trained on-site and be updated continually about new products. This improvement was reflected in customer service ratings.

A high complexity/low volume situation is defined as an environment in which key individuals' decisions could have a major impact on the organization. This is often the case with employees in the financial services industry. While individuals who work in areas with seemingly unlimited risks, such as trading, have often been regarded as having intuitive gifts, this notion has become increasingly challenged as a result of highly publicized cases such as that of derivatives equities traders' activities that resulted in unfavorable consequences. Companies are beginning to recognize that although intuition may play a role, improved decision-making can in fact be taught.

In the case of one leading financial institution, Andersen Consulting devised a program to improve risk management by creating a simulated environment in which employees could develop their skills without monetary loss or legal repercussions in the event of failure. Employees using this performance simulation are presented with a complex but realistic business goal, and they use real-life inputs to complete the task. They are able to interact with people and objects found in their everyday working lives. Support systems are built into the simulation to offer guidelines as they perform a series of tasks designed to achieve their desired goal.

Each performance simulation is created and customized to meet a particular company's needs. There are three phases to building a performance simulation: conceptual design, development, and implementation. The conceptual design phase generally takes six to eight weeks and results in a conceptual design report, a business case, a development plan, and a prototype. A conceptual design report contains the simulation objectives, prerequisites, tasks, topics, story line, and technology specifications and requirements. During this phase, subject matter experts are interviewed, war stories are gathered, desired behaviors are identified, and key messages are developed. The development phase takes

four to eight months and results in detailed design specifications, pilot results, a tested performance simulation application, and a rollout plan. How long the implementation phase takes depends on the scope and specifics of the organization.

The Impact on Supply Chain Management

In today's supply chain environment, costs typically account for greater than 50% of revenue, percent cost of goods sold improvements more than double percent operating income increases, and 50% of savings is dependent on human performance. In addition, as many as 60% of supply chain initiatives are not implemented as planned because the people and organizational aspects of the initiative are ignored. Improved forms of training warrant companies' increased attention.

Supply chain planning is one area that can significantly benefit from improved decision-making capabilities. The success of any planning initiative depends upon the decision-makers' ability to harness the full power of the planning tools to make better business decisions. Examples of supply chain areas where this is important are forecasting demand, capacity analysis, inventory management, schedule sequencing, labor planning, material planning, load building, and route optimization.

Performance simulation can help an organization to optimize its supply chain by improving the performance of those individuals who manage these planning

areas. The following example powerfully illustrates how the rich learning environment can rapidly build expertise.

Supply Chain Planning Performance Simulation

An Andersen Consulting supply chain planning performance simulation kicks off with an introductory video by the CEO or other senior executive, highlighting the benefits this experience brings to both the learner and the company. Providing such a consistent message engages and excites the learner by providing reinforcement from a high-level executive.

Two segments typically follow the introduction: (1) Build Knowledge, and (2) Simulate Optimization. In the Build Knowledge segment, learners build a base-level understanding of supply chains, demand, master, production, and transportation planning, and, importantly, the interdependencies of these topics. Access to practice exercises, stories, a glossary, and the completion of a final test are among the many ways in which the learner is able to improve the retention of the new subject matter.

In the Simulate Optimization segment, learners enter a simulated supply chain environment in which to test the impact of critical business decisions in a specific area. An example of the inventory management area page is shown in Figure 2.0. The screen includes the following:

- A timeline that depicts the learner's progress
- An inventory dashboard that shows the metrics the learner is being measured against and the target ranges
- An inbox that provides product overviews, flash memos, guidance from key stakeholders
- Information on forecasted demand
- Actual orders
- Frozen schedules
- A worksheet to schedule receipts and plan order releases for future periods

The learner can now practice making inventory management decisions in a risk-free environment. The hands-on and rapid learning pace of the simulator accelerates their time to competency.

A typical inventory management simulation might be as follows: the learner begins by checking a memo with inventory targets for one of the products that requires inventory management decisions. The student has learned that the lead-time is two weeks, safety stock is 100, and the order quantity is 50 and will need to factor this into his or her thinking. The learner can then gather important information such as actual orders or feedback from various people, even suppliers. As would happen on the job, other parties have perspectives and insights into the learner's work, and provide guidance that is consistent with the desired vision, culture, and behaviors of the organization. Here, the learner gets a suggestion from her operations manager to review the inventory concepts to gather more information.

After reviewing these concepts, the learner feels ready to continue with the task. On the worksheet, the forecasted demand and actual orders for each period are provided and on-hand inventory is calculated. The learner is accountable to enter scheduled receipts and planned-order releases. The learner needs to keep the information from the inventory targets memo in mind, as well as the metrics shown on the dashboard. After the learner enters scheduled receipts and planned-order releases, the inputs are processed and evaluated. A large demand model runs in the background and determines the impact of the learner's actions on the on-hand inventory and dashboard metrics. In the beginning, the learners usually do well in some areas and not well in others. This process continues from planning period to planning period.

In planning period three, feedback from a teammate advises the learner to take action because safety stock fell below target levels and actual orders differed from forecasted demand, which potentially could result in a shortage. The type of feedback a learner receives will vary depending on her experience and inputs.

After the learner considers this input, she moves up the second set of releases and receipts by two weeks because inventory fell below safety stock. The demand model once again evaluates the impact of the learner's

actions on the on-hand inventory and dashboard metrics. Note that this description of a typical experience gives an illusion of a linear sequence; in an actual simulation this is not the case. In this game-like environment, the learner "wins" if she reaches and maintains the target levels for the four metrics over a specific period of time (usually one year). If the learner "loses," she will have to start from the beginning again. Given the number of periods and items the learner has to enter, it is virtually impossible for the learner to "cheat" her way through the simulation. Other supply chain planning area simulations work much the same way. For example, when forecasting demand, a learner is provided with "last year this month," "promotion," and "point-of-sale data/actuals" information. She must consider this information and forecast the demand. As the learner forecasts demand, the demand model once again runs behind the scenes and the impact the learner's actions had on inventory accuracy is reflected. The emphasis in this particular simulation is on taking the trade and promotion calendar plans (for example, advertising, direct mail samples, end-of-aisle displays, coupons, customer volume discounts, consumer mail-in rebates, etc.) into account. The learner repeats this process until he or she has mastered forecasting demand over the specified periods.

Conclusion

The explosion of innovations in supply chain technologies and the arrival of the Internet is creating incredible opportunities for the companies who master them to build significant competitive advantage and shareholder value. But with this opportunity comes a difficult challenge. The complexity and speed of acclimation required to stay ahead can stretch the ability of the workforce to learn the necessary skills and understand new ideas. At best, this limitation can mean reduced returns on investments; at worst it can cause complete failure. Under these circumstances, it is clear that performance simulation has a key role to play in the most crucial supply chain change programs.