MOVING IN A NEW DIRECTION: TRAINING & SIMULATION TECHNOLOGY CONSORTIUM

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Abstract

The Training and Simulation Technology Consortium (TSTC) is a new model for transferring defense training and simulation technology involving a partnership between the federal government, industry, and a university. Members include three government agencies, four DoD based industries and a major university. These members determined that technology transfer would not occur without commercialization. This involves identifying new customers, understanding customer requirements, matching requirements to defense-based capabilities, and then developing the distribution and sales process. TSTC was established to support this commercialization process through the Advanced Research Projects Agency (ARPA) under the Technology Reinvestment Program (TRP).

This paper reports on the process of forming the consortium, the barriers surmounted, the results of the consortium's efforts and what the future holds for such efforts.

About the Authors

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The Training and Simulation Technology Consortium (TSTC) is a new model for transferring DoD training and simulation technology involving a partnership between the federal government, industry, and a university. Members include: the Naval Air Warfare Center Training Systems Division, the Army Simulation, Training, and Instrumentation Command, National Aeronautical and Space Administration, Loral Federal Systems, Analysis and Technology *Incorporated, Dual Inc., Dynamics Research* Corporation, and the University of Central Florida's Institute for Simulation and Training.

The TSTC members recognized that technology transfer would not occur without commercialization. New customers and markets needed to be located and new relationships had to be formed if defense training and simulation technology was to be applied in civilian sectors, both public and private. This concept was the basis for the TSTC proposal and was submitted to the Advanced Research Projects Agency (ARPA) under the Technology Reinvestment Program. This proposal was selected as one of the funded TRP projects.

This paper reports on the process of forming the consortium, the barriers surmounted, the results of the consortium's efforts and what the future holds for such efforts. The paper will also discuss the commercialization processes developed to date, the services available to the training and simulation industry from the TSTC, major milestones and achievements, and what the future holds for such efforts.

THE NEED FOR A TRAINING AND SIMULATION TECHNOLOGY CONSORTIUM

National Mandate

On February 22, 1993, President Clinton and Vice President Gore unveiled "Technology for America's Economic Growth, A New Direction To Build Economic Strength." This plan calls for:

-strengthening America's industrial competitiveness and creating jobs;

- forging a closer working partnership among industry, federal and state governments, workers, and universities;

- redirecting the focus of our national efforts toward technologies crucial to today's businesses and a growing economy;

- improving the skills offered by American workers by increasing the accessibility of education and training, and

- improving technology for education and training by supporting developments that increase the productivity of learning in schools, a variety of business training facilities and in homes (Clinton, 1993).

The Training and Simulation Technology Consortium, Inc. supports each of the five objectives cited in the President's plan. One of the keys to strengthening America's competitiveness lies in improving human performance. Improvements in human performance can be achieved through education, training, and simulation tools.

The Department of Defense has invested billions of dollars developing substantial expertise in state-of-the-art training and simulation technology. Although this technology has many civilian applications, very little has been transitioned to the civilian sector. Principal barriers to this transition include lack of knowledge about commercial markets on the part of defense contractors, and lack of knowledge about defense technologies on the part of potential customers. The Training and Simulation Technology Consortium, through its varied membership and staff expertise, combines knowledge of commercial markets with knowledge of defense technologies to provide the basis for eliminating many of the barriers to commercialization.

Specific Need: GameShell

A specific example of the need to provide a resource to assist defense based companies in commercializing military simulation and training technology, and in fact an impetus for the creation of the Training and Simulation Technology Consortium, was the attempt to market a software product developed through a Cooperative Research and Development Agreement (CRADA) between the Naval Air Warfare Center Training Systems Division (NAWCTSD) and Dynamics Research Corporation (DRC). NAWCTSD and DRC jointly developed a software tool which enables instructors to enter test questions in a database and quickly generate educational testing games. Transitioning the software to military users was relatively easy. A message describing the software was released and software was provided in response to requests. Commercial distribution of the software was not so simple. DRC was confronted with the issues of locating markets, advertising, pricing, packaging, marketing, distribution, and customer support. The product, GAMESHELL, was the first commercial education or training venture for the company. DRC did not have a commercial marketing group. They did have an employee who had worked in the vocational education market and knew of some software distributors. DRC approached these vocational education product distributors, who agreed to sell the product. These distributors reviewed the product and suggested a price. On this basis, DRC invested in a commercial formulation and packaging of the product. Initially, there were no commercial sales. Soon, DRC recognized the need for expert market research and contracted with a marketing consultant. As a result, DRC restructured the pricing, produced some promotional material, and began sales of the product.

In looking back, it was apparent that the product was launched without the benefit of sufficient market research to properly identify the best customer group and to determine the correct pricing strategy. Because DRC was organized to operate in the defense contracting environment in which a product is developed and delivered to a predefined customer, they were unprepared to address a mass market. The commercial world operates quite differently from DoD. Prices are set by the market place, and a product must be sold to many customers to generate a return on an investment.

Addressing the Needs: Responding to the Technology Reinvestment Program

The expertise and technology which supports military training is viewed by many to represent the state-of-the-art. During the same time period that DRC was marketing GAMESHELL, federal policy officials were examining how best to transfer defense training and simulation technology to civilian applications. It seemed that much of the technology developed for military training could be applied to other areas such as public education and commercial training with tremendous gains in human performance. In fact, the defense simulation and training industry and military agencies were cited in President Clinton's and Vice President Gore's Economic Plan as a national resource to be tapped for refueling the nation's economy (Clinton, 1993). Yet the problem of disseminating this technology through commercialization remained. With defense downsizing, few companies have the resources to acquire the commercialization expertise needed to modify and market the technology in new customer segments. Further, in many cases, companies have a limited number of products and little expertise with commercial applications. Determining the products with commercial potential, identifying markets, deciding how much to invest in commercialization, selecting best techniques for product distribution and marketing -- all require expertise in a wide range of commercialization capabilities.

With the announcement of the Technology Reinvestment Program came the promise for funding assistance in defense conversion and the opportunity to create a new way to deploy federally funded technology. NAWCTSD, with the Army Simulation, Training, and Instrumentation Command and NASA Kennedy Space Center as government partners, teamed with Loral Federal Systems (then IBM Federal Systems), DRC, Analysis & Technology, Dual, Inc, and the University of Central Florida to submit a proposal which would establish a Training and Simulation Technology Consortium to support the commercialization of defense simulation and training technology and consulting expertise. As described in the proposal, the consortium will provide market research expertise to identify potential customers for the DoD technology, matching available DoD technology to the customer requirements thereby applying the technology for commercial uses. Also, the consortium was designed to serve as a resource for those seeking simulation and training technology and expertise by providing information on specific technologies and expertise available in the DoD. The Training and Simulation Technology Consortium was developed to assist both defense suppliers in finding new markets and work with non-defense customers to locate defense simulation and training technology. The consortium will do this by:

- Determining markets which could best use the DoD developed technology;

- Identifying the sources of the technology from among the DoD suppliers;

- Providing a focal point for access to the technology for potential customers in civilian markets;

- Providing DoD industry with product commercialization and consulting services;

- Conducting on-going market research to maintain an up-to-date customer group;

- Becoming a self-supporting organization within three years through membership, marketing or product royalty fees;

ESTABLISHING THE CONSORTIUM

Between the time of proposal submission (23 July 93) and the date that the Consortium learned that their proposal was selected for funding (24 Nov 93), the team members continued to meet to discuss how to implement the proposed concept. With the announcement of the award, efforts became even more intense. The proposal called for the consortium to organize as a not-for-profit corporation with a Management Board comprised of consortium members. The proposal stated that the corporation was to be headed by a salaried executive director, who serves at the pleasure of the management board. (Moving in a New Direction: Training and Simulation Technology Consortium, 1993.) This board was to be comprised of voting members from each organization forming the consortium. The Executive Director would work with a small staff of five professionals and administrative specialists including a Marketing Coordinator, Technology Coordinator, Consulting Coordinator, Administrative Assistant, and Secretary/ Receptionist, plus several consulting experts.

The initial tasks confronting the original team were to:

- actually form the consortium (both the corporation and the relationships of the members);

- hire the staff;

- prepare for and negotiate with ARPA;

- and define ways for organizations to become members of the Consortium.

Organizational Structure

An issue surfaced with the University of Central Florida concerning their role. The proposal stated that the consortium would contract with the Business Development Group in the College of Business Administration at the University of Central Florida (UCF) for human resource management services to include recruitment, selection, training, development, supervision, and benefits coordination. UCF would also serve as the fiscal agent. This was the proposed approach because legal counsel raised the issue of whether ARPA would provide funding to a new entity such as the TSTC or if there were advantages in allowing UCF to administer the funds. Two factors caused the members to change the initial approach. First, ARPA had no objections to contracting with a new entity provided that appropriate procedures were followed, including use of a commercial accounting firm for audit purposes. Second, the members found that by establishing a separate entity, they could more closely approach the structure of a small, entrepreneurial firm and reduce administrative costs.

This decision did create some additional tasks in establishing the TSTC, Inc. The members had to locate a commercial audit firm, find a bank, establish an accounting system, and locate personnel support, including a way for providing employee benefits. These tasks were performed by subcommittees comprised of the initial team members and representatives from their organizations. The budget was also revised by a subcommittee to reflect these changes.

An innovative approach to the personnel support issue was to form an agreement with an employee leasing firm in a co-management role to act as TSTC's personnel and payroll department. Administaff was selected because they offer competitive employee benefit packages, equal employment opportunity assistance, management training, and aid in screening and hiring employees. By adopting this approach, the members were able to minimize overhead costs while providing extremely competitive employee benefits.

Legal Issues

Loral Federal Systems and NAWC-TSD provided legal counsel to help formulate the by-laws of the consortium.

Devising and getting approval for the legal structure of the TSTC was made easier by involving a law firm familiar with the procedures of a consortium. The TSTC was incorporated in Florida as a not-for-profit

corporation in April 1994. Legal issues confronted by the members included anti-trust legislation, liability, and conflict of interest concerns. The new Executive Director's experience solved many of these issues. The anti-trust issue of competitors coming together to work collectively became a simple one to address. Legislation supporting the Technology Reinvestment Program and cooperative agreements with ARPA exempts companies from anti-trust legislation. The issue of liability concerns for the Board of Directors was addressed by the purchase of insurance for the Board Members. The third issue of conflict of interest has been somewhat more difficult to address. The issue arises because the TSTC member companies bid for government contracts awarded by the TSTC federal members. Current Department of Defense conflict of interest regulations restrict DoD employees from serving as Board of Director members in an official capacity. The potential conflict occurs when it is perceived that government officials may help companies compete for government contracts by becoming involved in the management of the corporation.

Under the present arrangements, the government members are members of the Consortium and are linked to the TSTC, Inc. through a document called a memorandum of participative cooperation. The government members serve as advisors to the TSTC, Inc.'s Board of Directors by participating on a committee. Unlike Board Members, they will not vote on issues presented to the Board for approval or resolution.

A charter and by-laws were written for the operation of the TSTC, Inc. These documents outline the purpose of the corporation and provide rules for its operations. These documents were submitted, along with Articles of Incorporation, to establish the TSTC, Inc., as a not-for-profit corporation under Florida law. Included in these documents are the in-kind contributions provided by the Charter members of the consortium. These documents were reviewed by all members and signed by all corporate members.

Hiring of Employees

The staff hiring process was handled by a subcommittee of the consortium, with oversight by all members. Advertisements were placed in the Wall Street Journal and The Orlando Sentinel for all positions. Over 600 resumes were received for all positions. The team determined that it was best to hire the director, and then allow that individual to hire the remaining staff. Mr. Michael Walter was hired as the executive director. He began working immediately, even prior to receipt of ARPA funds, to complete the final organizational tasks and to operate the Consortium. In addition to the Director, four other positions were filled.

Working with ARPA

The arrangement being used under the Technology Reinvestment Program to fund the TSTC is a modified Cooperative Agreement. Under a Cooperative Agreement, costs are shared between the "contractor" and the government. Many aspects of the TRP are unlike other forms of government contracting. The Contracting Officer's Technical Representative, or ARPA Executive Agent, for this effort is the NASA Consortium representative, Priscilla Elfrey. The guidance she received for this effort is to pursue new, innovative business practices in the contracting process. She took advantage of the advisory committee and several legal, and accounting consultants that helped guide the TSTC, Inc., to insure that the objectives outlined in the proposal are met. She helped the team organize and assemble the information needed to negotiate a contract with ARPA's agent, NASA. Therefore, little information was missing for the actual negotiations. The TSTC, Inc. was advanced some funding under a modified cooperative agreement to begin operations, while a final agreement was prepared.

Membership Procedures

A committee was formed to determine how companies and other organizations could join the TSTC. The original members all made significant in-kind contributions as part of the requirement for the ARPA award. They also contributed significantly in the proposal development process. Therefore, a strategy for membership was needed that would acknowledge this initial contribution, yet allow for expansion of the Consortium. The committee identified several categories of membership based on the level of contribution. Members joining can receive various levels of assistance, and contribute to TSTC operations in accordance with their membership status.

BEGINNING OPERATIONS

Even before the Executive Director was hired, the Consortium began to work together to identify new applications for Defense Simulation and Training Technology. One of the team members, Bill Jorgensen from DRC, acted as the interim Executive Director of the Consortium. He represented the consortium during meetings with the Los Angeles County Sheriff's Department, the California Commission on Peace

Officers Standards and Training, and AGC Corporation by outlining the capabilities of defense simulation and training technologies. As a result of this visit, the TSTC has organized a panel for I/ITSEC on law enforcement training requirements.

As outlined in the proposal, the consortium will perform tasks in two equally important, general categories: technology commercialization and consulting services. In the area of commercialization, the TSTC will perform two tasks. In the first task, the consortium will endeavor to identify and catalog the major defense training and simulation technologies. Market research will be performed to identify viable marketplaces and to gain insight into the needs of civilian target customer sets. Analysis then will be performed to identify and recommend defense training applications or technologies which can be modified to serve the needs of the new customer. Lastly, research will be performed to identify cost-effective distribution strategies. Work is underway to support this task. Consortium staff are becoming familiar with existing databases of defense simulation and training technology. They have also examined the commercial training market, and the state and local government markets and are developing a customer database, which will help bring new members to TSTC and new non-DoD customers for TSTC members.

The second task was to test the commercialization process on a known product. A specific training and simulation technology or product was identified and the analysis necessary to plan and implement its commercialization was performed. Market research helped identify potential marketplaces, analysis of the technology/product determined appropriate recommended modifications, potential sources of venture capital will be identified to assist in the commercialization effort, and potential product distribution channels will be identified.

In the area of consulting services, the TSTC will perform two tasks. The first will seek to confirm the goals and plans of the consortium for providing training and simulation consulting. The TSTC will identify and catalog the resources available within its membership with specialized training and simulation expertise. Market research will be performed to verify and better understand the target customer markets and their needs. Research will be performed to identify and implement appropriate, cost-effective access and delivery mechanisms for these consulting services. Again, work is currently in progress towards completion of this task. Member companies and government agencies have briefed the TSTC, Inc. staff on their capabilities and supplied them with documentation of their expertise.

The second task in this area targets a worthy, public sector customer (e.g. Florida School Year 2000) and provides consulting services to support that customer's specific training objectives. TSTC, Inc., is currently supporting School Year 2000 by serving as a "red team" reviewer for efforts, and by locating defense simulation and training software which might apply to their training requirements.

Several opportunities to apply certain DoD technologies and training applications are being pursued:

Nurse Job Aid--TSTC is working with the Orlando Regional Medical Center to develop a job aid for new registered nurses to assist them in delivering quality nursing care.

Association Training--TSTC is developing a partnership with Convention Planning Services, Inc. to provide training analysis and design expertise to major trade associations such as the American Dental Association, the American Medical Association and others.

Noise Suppression Technology--TSTC is working with Analysis & Technology and others to commercialize a noise suppression technology for the public telephone component industry.

Secure Wireless Technology--TSTC is working with TSTC members on commercialization of encrypted wireless technology for location based entertainment and resort industry uses.

Evaluating the Performance of the TSTC

Quarterly progress reports will be provided to ARPA which will describe actions taken to achieve success.

The measures of the TSTC's success will be in the areas of:

- number of commercialization projects;

- number of consulting hours provided for customers,

- increase in formerly defense dependent companies' non-DoD business base,

- gains in performance achieved by non-DoD customers through use of these products.

The ultimate measure of performance is the ability of the TSTC, Inc. to achieve self-sufficiency--to operate without federal funds. To become self-sufficient, the TSTC, Inc. must help the defense simulation and training industry commercialize their expertise and products. The TSTC is responsible for finding customers who are willing to invest in the modification or development of products from the DoD provider. This will result in commitment by the customer, financial gain for the provider, and revenue for TSTC to become self sufficient.

A Look at the Future

American's tax dollars have been invested heavily in training and simulation technologies for our highly skilled military services. This capability in defense systems, technology and know-how are valuable resources, which have great potential to provide training and education to America's students and workers.

The TSTC was established to foster job creation by helping its members commercialize their capabilities and to increase productivity in the civilian sector through use of the defense technology. TSTC connects its members with potential customers to whom solutions can be sold with the involvement and participation of the customer. The eventual product or service can then be productized for a broader market consisting of similar customers looking for the same or similar products.

Fundamentally, TSTC exists to commercialize products or services leading to incorporation of DoD products into the non-DoD markets. The approach of the TSTC is to leverage the tremendous technology investment of the DoD using start-up funding from ARPA, matched by participating corporations, and create commercial markets for DoD products. This approach recognizes the critical need to identify markets, communicate with potential customers, determine their needs, and re-engineer the DoD products to meet those needs. Using an aggressive commercialization and consulting approach for existing DoD products, the consortium will enable corporations to successfully deliver these products to a new market place.

If successful, the TSTC will realize the following benefits:

- DoD investments in training and simulation technology will be leveraged for maximum return by making this technology available and affordable for non-DoD users,

- applications will be tailored to meet customer needs and budgets to ensure that the best training or simulation solution is provided, thereby increasing productivity in the work place,

- opportunities for dual use development will be identified and pursued by industry and government.

The ultimate goal of the Training and Simulation Consortium is to enable delivery of well designed simulation and training products to new markets through well planned and managed market research, matching products to market needs, and productizations (re-engineering to meet market demands) of the products.

The consortium is poised to take the next logical steps to bridge the current gap between DoD developed technology and potential new markets by providing a national focal point for effective training and simulation technology transfer.

References:

Clinton, President William J., and Vice President Albert Gore, "Technology for America's Economic Growth: A New Direction to Build Economic Strength," February 22, 1993

"Moving in a New Direction: Training and Simulation Technology Consortium", Proposal submitted to Advanced Research Projects Agency under the Technology Reinvestment Program, June 23, 1993