Working with Geographically Dispersed Subject Matter Experts: A Large-Scale Model

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ABSTRACT

The content of this paper aligns with this year's I/ITSEC theme, *LEARN - TRAIN - WIN*. However, the focus is not directly on the Soldier, but rather on the individual responsible for designing and developing the training - defined as what the Soldier will learn and be trained to do, so that winning is achieved by accomplishing the task and/or mission.

The evolution of complex and distributed governmental and business challenges require the implementation of training design and development models that capture and mold the expertise of subject matter experts (SMEs). This paper describes the unique issues, and potential risks, along with solutions to work with a large number of geographically dispersed SMEs (separated from one another due to their respective locations), whose efforts are standardized and synchronized. The focus of this paper is a solution, based on a collaboration model implemented and led by an integration team whose role and responsibility was to allow the SMEs to achieve consensus, efficiency, and standard of quality in both products and processes. The model will be exemplified using a current large-scale military eight-year initiative to design and develop Training Support Packages (TSPs) to prepare Soldiers to use advanced technologies and employment concepts in a blended delivery format of live, virtual, and constructive. Therefore, this paper will provide a detailed examination of the existing education and training development fundamentals by providing a 3-step approach or framework to meet the requirements of this training design and development challenge.

ABOUT THE AUTHORS

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INTRODUCTION

The evolution of complex and distributed governmental and business challenges require the implementation of training design and development models that capture and mold the expertise of subject matter experts (SMEs). A SME is defined as "that individual who exhibits the highest level of expertise in performing a specialized job, task, or skill within the organization". SMEs possess in-depth knowledge of the subject you are attempting to document (http://www.isixsigma.com/dictionary/Subject_Matter_Expert_-_SME-396.htm). This paper describes a collaboration model, the potential risks and a solution to work with a large number of geographically dispersed SMEs (separated from one another due to their respective locations), whose efforts are standardized and synchronized.

This solution is based on the development of a collaboration model implemented and led by an integration team whose role and responsibility is to allow the SMEs to achieve consensus, efficiency, and standard of quality in both products and processes. The model is exemplified using a current large-scale military eight-year initiative to design TSPs to prepare Soldiers to use advanced technologies and employment concepts in a blended delivery format of live, virtual, and constructive training. The Live-Virtual-Constructive training environment combines any of these three approaches to create a common battlefield, on which live units can be represented along with virtual and constructive. These units can interact with one another and conduct a coordinated fight as though they were physically together on the same ground (United States Army Combined Arms Center, http://usacac.army.mil/CAC/functions/constructive.asp). This initiative will be used throughout the paper as the illustrative example to describe the rising challenges and opportunities related to the implementation of a large-scale collaboration model.

During the initial planning and analysis phase of the initiative, the authors designed a 3-step approach, which would facilitate and manage the project. This 3-step approach included: 1) identifying problems, issues or risks; 2) acknowledging the nature of the training design and development team, and 3) resolving or mitigating problems and/or risks via standardization of processes, procedures, and end product content and quality. The steps were not designed to be linear, as much as they were to be taken when situations or circumstances within the training design and development arose (see Figure 1).

Step 1 Identify problems, issues, or risks	**Step 2** Acknowledge nature of the design & development team	**Step 3** Resolve or mitigate problems, issues, or risks

Figure 1. 3-Step Approach

For example, the first step in the process was to identify potential problems, issues, and/or potential risks of this training initiative. Two obvious issues were identified: 1) working with three different organizations, each with their own internal structure and philosophy on training and development thus, resulting in a need for standardization; and 2) having a large number of individuals geographically dispersed, responsible for contributing to or creating the initiative's policies, processes, and products resulting in a need to find a means to work collaboratively from a distance.

Adding to the complexity of the initiative was acknowledging the nature of the training design and development team, which consisted of forty (40) SMEs, analysts in the initiative, representing three leading defense contractor companies, known as the One Team Partners (OTP). To resolve the issue of standardization, a three-member integration team (IT) was appointed by the Lead System Integrator (LSI) to facilitate the design and implementation of policies, procedures, and processes to accomplish the expected project goals and objectives of their primary customers by synchronizing, integrating, and standardizing the SMEs' work. This second step was the cornerstone for managing the design and development process and required the IT to understand and facilitate a diverse and dispersed group

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of individuals, working collectively and collaboratively.

The third step was to develop synergy (ability and willingness) between the IT and the OTPs (which included the 40 SMEs) to resolve and/or mitigate any problem, issue or risk to ensure the quality (completeness and accuracy) of the end-product), designed to support the instructional and training efforts for Soldiers deployed, awaiting deployment, or conducting combat operations.

The authors of this paper are two members of the three-member IT, serving as the lead instructional designer and lead content SME. This joint effort, during the first three years of an eight-year initiative, has completed or is nearly completed the initial planning and analysis phases using the collaboration model. This phase included mission, job, and task analyses for a major defense acquisition program, FCS, in preparation for the next phase, the design and development of TSPs.

The authors have changed the classic production model from instructional system designers (ISDers) creating tasks via collaboration with SMEs to SMEs producing tasks guided and assisted by ISDers. This production model and its approach have application across a wide array of instructional and training design and development environments (e.g., business/industry, military, and academic).

For example, typically when managing an educational or training initiative, ISDers depend on the SME for their expertise in curriculum content. The ISDers' involvement is critical during the analysis and design phases of a systematic instructional design approach. However, in our illustrative example, the content SMEs were the lead component and instrumental in actively participating in the planning phrase (the design and development of the policies, procedures, and processes) and were primarily responsible for writing the analyses results/findings. The content of the results were then reviewed by OTP ISDers for writing convention format (e.g., use of acronyms, punctuation, spacing and numbering) and instructional design format (e.g., sequencing of steps, alignment of performance steps and substeps with performance measures). To meet this instructional design review requirement, each OTP has a SME ISDer whose responsibility was to guide analysts (OTP SMEs) and to comply with the standards and guidelines related to instructional format and writing conventions.

In addition, there were vertical and horizontal reviews conducted by other content SMEs (e.g., internal and external to the OTP) for accuracy and completeness in terms of breadth and depth of content, in context. The intent of the IT in designing this methodology was to actively involve the SMEs from the onset, not only to capture their expertise, but also to gain and sustain their buy-in and commitment throughout the different phases of the initiative, and to do so primarily from a distance. Therefore, to resolve the second issue of the OTPs collaborating from a distance, the lead IT developed a process using technology (e.g., Web-based application and tools, relational database) to lessen the impact of being geographically dispersed.

Background

The goal of this large-scale collaboration model was to integrate the contributions submitted by multiple sub contractors (known in our illustrative example as the OTPs). To meet this goal, the prime contractor appointed a lead IT with the responsibility to the customer, prime contractor, and the OTPs to synchronize (move along at same rate) and standardize (end-product has the same structure and language) processes and products.

To better understand the underlying framework from which to build a large-scale collaboration model, system design is discussed. System designers envision the entity to be designed as a whole, as one that is designed from the synthesis of the interaction of its parts. Systems design requires both coordination and integration. There is a need to design all parts interactively, therefore simultaneously. This requires coordination. The requirement of designing for interdependency across all systems levels invites integration. In an age of continuous and intensified change, the understanding of the role of systems design in creating our future and the development of competence in systems design are of the highest priority (Banathy, 2000).

Since the overarching component of such an initiative was the integration of work produced by the multiple OTPs, the lead IT adopted a systemic approach to achieve process and product standardization. To understand instructional development, it is helpful to view from within the context in which it functions. An educational or training environment is, in effect, *a system of systems*. By definition, a system (the whole) is a structure that is dependent on the product of the interrelationships of the parts rather than the attributes of any individual part (Ackoff, 1995). Therefore, it is imperative to view an instructional development

initiative within a systems approach context based on general systems theory.

General systems theory (Gharajedaghi, 1999; Rothwell & Kazanas, 1992) is based on the belief that for significant and long-term change or opportunity to become institutionalized, it is imperative to recognize and manage the organization as a system. A system, composed of the performance of interrelated subsystems, forms a unified whole which is more than the sum of its individual parts. The application of general systems theory develops performance and instructional strategies in a systematic manner and includes the following: identifying specific requirements, designing an optimum solution, developing an intervention, and comparing results to plans (Branson & Gilbert, 1997).

General systems theory characterizes systems in terms of being either open or closed. The biggest impediment in creating an open system is often communication, either in misinterpretation or the interruptions in the process, which causes voids in the cascading upward or downward flow of inputs and outputs. This was critical in our initiative because we had individuals who were geographically dispersed and yet required to collaborate from a distance. Communication and collaboration were critical elements in order for processes to function effectively and efficiently. The lead IT had to recognize when inputs, outputs, and continuous feedback were not flowing constantly or consistently within a system, or else it would have resulted in a closed system filled with breakdowns, lost effort, or black hole voids. Black holes are spots within the system (e.g., corporate universe) that seem to exert, or change projects, an effect that is similar to the effect of black holes on matter in space. Management's change rhetoric is pulled, as if by gravity, into bureaucratic layers and structures, wherein it forever vanished without trace or effect (Conner, 1998, p. 251). These voids, over time, would have resulted in a system suffering from entropy because of information not passing from one level to the next, vertically or horizontally.

The entropic effect occurs when the system's goals are no longer the focal point of the inputs, outputs, and feedback. These effects will eventually render the system to become a closed system and with time, dysfunctional. Keeping the system healthy and functioning at a level in which its goals are being met by means of actively contributing inputs, outputs, and continuous feedback is referred to as maintaining an open system. A system in which all subsystems share a common goal must be receptive to inputs and outputs in making its goal a reality (Rothwell & Kazanas, 1998). In order to create and sustain an open system the IT, from the onset, actively engaged the partners by formally requesting input and feedback as the initiative policies, procedures, and processes were being designed and developed.

Further, in order for an instructional development environment to be successful, it must function as an open system; a system that openly receives inputs from the environment (e.g., resources and sources: stakeholders/partners, research and development, and expertise, standards, guidelines). Instructional development systems or models are then transformed through systematic design functions within the system (e.g., planning, analysis, design, development, delivery/ implementation, and evaluation). Subsequently, the system provides outputs to the environment (e.g., evaluation and accountability measures of results – outcomes and/or products achieved). Similarly, open systems continuously receive feedback from stakeholders/partners indicating how well these functions have been carried out. To survive, an open system must gain advantages (e.g., return-on-investment) from its transactions with the environment (Rothwell & Kazanas, 1992, p. 10) (see Figure 2).

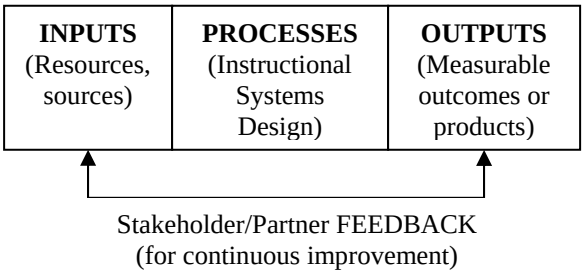

Figure 2. Components of an open system instructional development environment (adapted from Rothwell & Kazanas, 1992).

In our illustrative example, the instructional development structure has multiple tiers of partners functioning in change roles. To better understand the roles, responsibilities, and interrelationships it is important to understand their definitions. The change roles are based on role assignments for change projects as defined by Conner (1992). "Working relationships can be highly complex and convoluted, with people playing more than one role and frequently shifting roles once a change is under way" (Conner, 1992; p. 105). The role assignments are defined as (Conner, 1992; pp. 106-107):

- *Sponsor*: an individual or group who has the power to sanction or legitimize change. A sponsor decides

which changes will happen, communicates the new priorities to the organization, and provides the proper reinforcement to assure success. Sponsorship takes far more than ideas and rhetoric; it requires the ability and willingness to apply and to enable the meaningful rewards and pressure that produce and enable desired results to be made on time and within budget.

- *Initial Sponsor*: an individual or group who has the power to break from the status quo and sanction a significant change (e.g., primary customer - military or government agency). An initial sponsor is usually higher in the hierarchy than those who must perform the duties of sustaining sponsors. The initiating sponsor must be able to enlist the support of sustaining sponsors down in the organization, or the change is certain to fail.
- *Sustaining Sponsor*: one who supports and follows through with the sponsor commitment and allocation of resources for his/her arena of influence. A sustaining sponsor has enough proximity to local targets, those individuals or groups who must actually change, to maintain focus and motivation on the change goals (e.g., prime contractor). Sustaining sponsors minimize logistic, economic, and political gaps that exist between layers of the organization and produce the appropriate structure of rewards and punishments that promote achievement.
- *Advocate:* an individual or group who wants to achieve a change but lacks the power to sanction it. However, advocates are influential and valued for their advice and recommendations given to the sponsor and others (e.g., dependent on the situation this role can be filled by the OTP project managers, the lead IT, or the SMEs themselves).
- *Change Agent*: an individual or group who is responsible for implementing the change (e.g., IT, project managers). Agent success depends on the ability to diagnose potential problems, develop a plan to deal with these issues, and execute the change effectively.
- *Change Target*: an individual or group who must change (SMEs – content/technical and instructional analysts, designers, developers). To increase the likelihood of success, they must be educated to understand the changes they are expected to accommodate, and they must be involved appropriately in the implementation process.

In our illustrative example, the *initial sponsor* is the military or government agency (a.k.a., primary customer) who has the ultimate/final authority and responsibility to accept/reject the end-product. The *sustaining sponsor* is the government contractor (a.k.a., prime contractor) who has the authority and responsibility to accept/reject the end-product). The *change agents* are the OTP project managers (a.k.a., subcontractors) and the lead IT that has managerial roles and responsibilities to comply with standards and guidelines when submitting the end-product for approval/acceptance. The *change targets* who are the content SMEs, OTP instructional designers, and training developers who follow the policies, procedures, and processes for creating the end-product (see Figure 3).

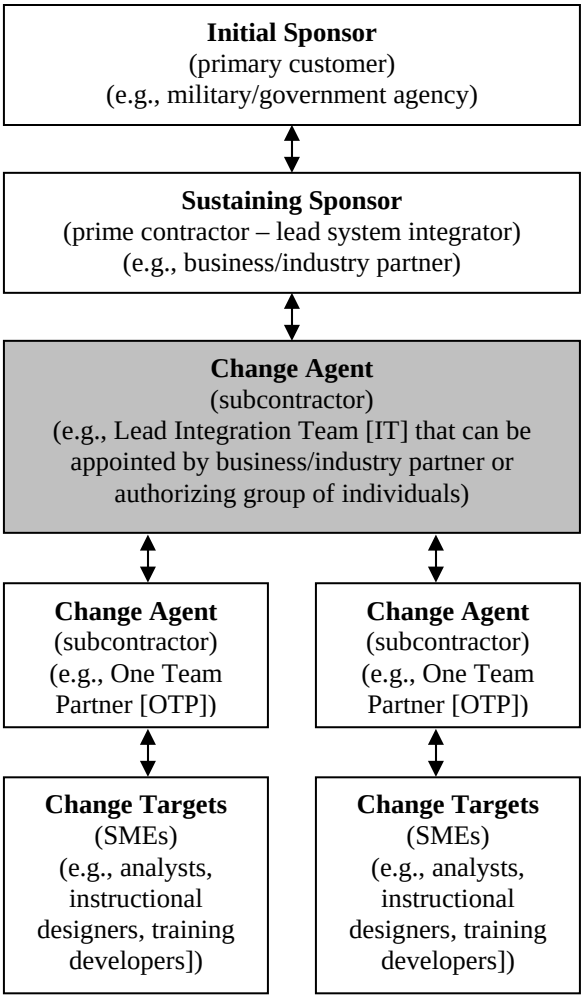

Figure 3. Chain of responsibility and authority within in a change management role-based organization.

As noted by Conner (1992), as with any change initiative, this large-scale model had individuals with roles and responsibilities that are multi-disciplined (having more than one area of expertise) and multi-functional (having to perform more than one role) (p. 105). For example, a project manager may have the following roles/responsibilities: 1) as a change agent leads/supervises the work of his respective team within the OTP organization/structure, 2) as an advocate for individual analysts within his respective team, and 3) as a change agent who performs as approver of product that moves along the tiers of internal review/approval for submission to the external review team (i.e., the lead IT).

To oversee the instructional development (ID) initiative described herein, the lead IT adopted a systematic model for working with SMEs. ID models provide communication tools for determining appropriate outcomes, collecting data, analyzing data, generating learning strategies, selecting or constructing media, conducting assessment, and implementing and revising results (Gustafson & Branch, 2002, p. 2). The core elements/phases of any ID model are *analyze, design, develop, implement,* and *evaluate* (ADDIE) – each element informs the other as development takes place and revisions continue throughout the process via ongoing planning at the onset of each phase and formative evaluations conducted during each phase.

The ADDIE ID Model is well documented and widely used in military, business/industry, and academic training/education programs. However, the lead IT modified the ADDIE ID Model that appeared in Gustafson and Branch (2002, p. 3) to incorporate the upfront strategic planning phase and technology components.

For example, the ID Model adopted by the lead IT includes the following modifications and operational definitions: 1) upfront strategic planning (SP) – the phase where ADDIE is employed for the initiative or project as a whole, consisting of interrelated parts and 2) technology components that are comprised of tools and applications (T) to manage (e.g., relational database/repository, report generator, search engine); produce (e.g., standardized tools to create documents); and communicate (e.g., availability and accessibility of online collaborative meeting/classroom environment) aspects of development process/product, thus the new acronym SP/T-ADDIE (see Figure 4).

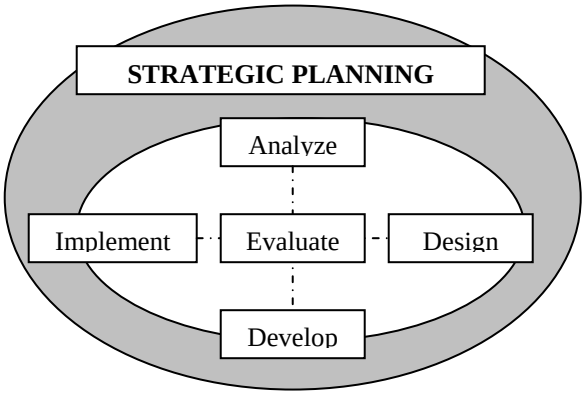

Figure 4. Core elements of instructional development: SP/T-ADDIE Model

A critical task of the lead IT was to establish business rules (i.e., guidelines for developing consensus-building). Kaufman, Herman, and Watters (1996) present an educational strategic planning framework with a focus on the primary client and beneficiary of what is planned and delivered. This framework or model embraces a systems approach and illustrates the interrelationships among three major clusters 1) scoping, 2) planning, and 3) implementation and continuous improvement.

The *scoping* cluster begins the guiding star or ideal vision, defined as the kind of world we would want for tomorrow's performer, and then selects what the educational system commits to deliver. This delivery selection identifies the needs and mission objectives (e.g., what is and what should be and how to close the gap between the two).

The *planning* cluster includes the strategic plan devised by examining the strengths, weaknesses, opportunities, and threats of the implementation and identifying the long and short-term milestones (e.g., measure of incremental successes).

The *implementation and continuous improvement* cluster includes tactical and operational planning (e.g., how to get from here to there), securing resources, diffusing the initiative, and conducting formative evaluations for continuous improvement of the initiative policies, processes, and procedures. For the purpose of continuous improvement, criteria must be developed to measure the effectiveness and efficiency of the initiative. This was accomplished via the technical and management plans adopted by the OTPs, IT, and primary contractor.

Kaufman's strategic planning and decision-making model (1998) focuses on making societal contributions in addition to meeting its own requirements for contribution and survival, thus the three levels of focus 1) micro (e.g., individual), 2) macro (e.g., organizational), and 3) mega (e.g., societal). In our illustrative example, the true outcome or mega contribution to society is the development of a well-trained Soldier that has the skills, knowledge, and abilities to protect home and abroad, resulting in the saving of lives and property.

As stated previously, an important element to working with SMEs is the ability to develop and manage collaboration and decision-making. Therefore, the lead IT developed two main components: *Real time* (collaborative online learning/consensus-building environment) and *relational database/repository* (capabilities to manage document development; review with multi-tiered feedback; store documents in various states of development; search document whole or parts; and generate reports and automated notifications).

As with any implementation effort, there are inevitably issues, controversies, and/or problems. The lead IT had numerous opportunities to manage these with a focus on minimal disruption or cost to the program overall, much in part due to the collaborative effort of the OTPs and the primary contractor (sustaining sponsor). The following paragraphs discuss specific issues or problems and the resolutions to manage, minimize, or eliminate them.

Use of Technology Tools and Applications Issue

A major issue when working with SMEs was to determine the most effective and efficient use of technology tools and applications (e.g., finding a suitable/customizable database and management system, taking advantage of the reviewing features of word processing program [e.g., Microsoft® Word]). In order to provide a seamless environment to its end-users, the initiative required modifications of an existing relational database to meet the requirements of the implementation effort. Once the technology was in place, there was the matter of developing workable templates to capture the required data to produce the end-product. This was accomplished via collaboration with the system technicians and analysts (i.e., those who would capture the data from multiple sources and entering data into the system). Then the issue of offline word processing for exchanging specific comments and edits on draft documents (e.g., track change features using MS® Word or features within the relational database) became an issue to those unfamiliar with the features and techniques to work through the reviewing procedures. Resolution of the issue was accomplished by the IT, OTP instructional designers, task leads, and analysts via formal training and direct one-on-one help/guidance. This training was delivered in a blended format, which constituted a combination of face-to-face live sessions and virtual online sessions, based on time and location constraints.

Real-time Online Collaborative Environment Issue

To meet the challenge of working at a distance, the lead IT selected to work within a real-time online collaborative environment (e.g., Elluminate Live® [two way text and audio conferencing using application sharing features], Altess VISi Meeting [two-way text with audio bridge via AT&T with application sharing features], online service providers with live voice and text messaging capabilities). This mode of communication, relatively new to many of the partners, resulted in a training solution designed by the instructional designers representing the OTPs and IT. The real-time online collaboration minimized the requirement for travel, while greatly reducing associated costs (e.g., food and lodging, telephone charges, time away from office/work settings). However, the greatest value was in the ability to work at a moment's notice in an environment that closely resembled a live face-to-face setting. The key was having the facilitation skills and expertise to coordinate and conduct such meetings/training sessions. The lead IT was fortunate to have key personnel with these knowledge and skill sets and years of experience working within collaborative online environments, both in education and training contexts. The greatest controversy was a security issue when using such an environment when contracted by a military or government agency. There are license agreements and access issues; however, in our illustrative example the military had access to a proprietary online environment that had many of the same features as available commercial systems.

Nature of the Subject Matter Experts Issue

A common issue when working with SMEs is the nature of the SMEs. Nature is defined as the characteristics of SME as they relate to solutions, processes, and product design and/or development (e.g., their knowledge and skill set, breadth and depth of experience, their role within the program – analyst, managerial, supervisory). The areas of SME expertise

are often focused on specific function (e.g., knowledge and skill set, experience), frequently overlap, and were interrelated with other SME expertise.

So what does all of this tell about the nature of SMEs? It is probable that all SMEs are, or at some point in their career development when they were acquiring the subject matter expertise were, highly motivated, self-directed, determined individuals willing to spend countless hours engaging in effortful practice. It is likely that by focusing their efforts on acquiring domain specific skills, they systematically excluded themselves from engaging in other activities, at least for some period of time.

It is particularly interesting to consider the role that SMEs are given within a project team. Typically, ID projects are structured such that the SMEs contribute to solutions, processes, and product design by providing their content knowledge to trained ISDers. In our illustrative example, the SMEs were the driving force behind the effort and were therefore in key roles such as analysts, managers, and supervisors, going beyond their domain specific expertise. That is, the SMEs were serving as a project or team lead and had to make decisions and act from a perspective other than that of their domain knowledge. When you have such a vast number of SMEs with varying areas of specialization working together, lines of communication are of the utmost importance from the onset of the project for efficiency and effectiveness.

To deal with this issue of working with SMEs it was imperative to adopt a systemic and systematic approach where the interrelationships are known, understood, and embraced as strengths for problem solving and decision-making and not viewed as obstacles or challenges to the ID process. For example, in the initiative there were seven task leads (TLs), representing the OTPs. Their role was to follow the lead of the project manager and to oversee the work of the analyst. They served at times as a change agent, a change target, and advocate, depending on the situation or context of the problem or issue. The lead IT had to establish business rules that would guide the process for reaching consensus (e.g., accepting a common definition of approved terms and illustrative examples). Their collaboration and recommendation was then reviewed by the OTP project managers and the IT.

The goal was to get beyond an arbitrary decision or policy and adopt, based on active participation/decision-making process and procedure. It was the experience of the lead IT that this approach not only strengthens acceptance/adoption, but also better ensured sustained buy-in and commitment because of the active involvement of the partners in the decision-making process. The key was to develop a continuous and open feedback loop, once again embracing a systemic and systematic approach to planning and decision-making.

Standardization and Compliance Issue

To carry out a large-scale initiative it was important to understand the power of standardization for outcomes/products and the compliance with standards and guidelines for processes and products. Compliance was resolved by creating an internal and external review process of product drafts and final versions. The business rules that governed the internal review process were determined by each of the OTPs, knowing that the external review would be dependent on certain criteria being met at the internal level. As it was the responsibility of the lead IT to approve the end product that was then forwarded to the prime contractor, it was imperative that the end product appear as if it were written by one partner, not three separate partners (OTP SMEs) – standardization enabled that to be accomplished.

Another important issue that emerged during implementation was the value of having a pressure-release - a means or process in which senior level managers had the ability to influence process and product via business rule set. An analogy would be a court of appeals. This capability provided the analyst an avenue to gain support/advocacy from senior management. This support resulted in changes in business rules and content review results, as evident by the end product beginning delivered to the client before the scheduled deadline and accepted as quality content and completeness.

Collaborative Issues

Jensen (2002, cited in Warner, Letsky, & Cowen, 2003) addressed collaborative challenges, issues that can hinder or prohibit successful implementation if not address in a timely and organized/planned manner. Jensen went on to cite the following major factors influencing military collaborative teams:

- Increasing problem complexity – team effort needed
- Integrated Technology / Communications – technology widening accessibility of contributors

- Problems addressed at international level – coalitions required
- Defense Transformation to agile and coalition operations
- Information overload condition

The lead IT revised this list of collaborative challenges based on its experience as noted below.

- Increasing problem and task complexity – team effort needed (e.g., resource reallocation: moving SMEs other roles/responsibility beyond the scope the original work order)
- Integrated Technology / Communications – technology widening accessibility of contributors and archiving and collection of end-products
- Problems addressed at a multiple tier level (e.g., ISDers, TLs, IT, PMs) – where coalitions are required. For example, the PMs agreed to conduct a specific task analysis outside the scope of the contracted work, formed a coalition as to how they would attack the problem, and then presented a proposed solution to the prime contractor for approval/acceptance.
- Information overload condition. As with any adult learner, the learning curve is steep when experiencing new knowledge and skills. The lead IT developed training for the OTPs based on the theoretical framework of Ausubel's meaningful reception learning and schema theory (Ausubel, et al., 1978), where a learner transfers previous learning to new information. For example, the lead IT designed the delivery of new information via illustrative examples so that the learner could relate to the information based on their prior experience, or learning. In addition, situated cognition theory, or situated learning, served as a theoretical framework. Situation learning is defined as occurring when declarative knowledge ("knowing that") and procedural knowledge ("knowing how") are integrated within a single framework (Driscoll, 2005, p. 154). Through constant feedback and training within the context of the situation and the community of learners that the partners formed, the information load was manageable and productive.
- Content SMEs must be balanced with ISD analyst SMEs. It was understood that the content was typically outside the expertise of the ISD SME, and therefore he / she was not expected to have the knowledge and skill set to write instruction; however, we found the greatest value when they worked in tandem with the instructional SMEs – to integrate or combine the expertise of both to make the whole.

Future Trends

The use of online collaborative learning/training environments is gaining greater popularity in academic and business/industry settings. Military and government agencies are seeing the value and benefit, in terms of cost and effectiveness in training programs, as well. Hofmann (2004) states, "like every innovation, learning technologies are a mixed blessing. They allow us to present content in many different formats and deliver that content to widely dispersed audiences at a relatively low cost" (p.1). In the illustrative example, the lead IT took the online learning environment and used it for that purpose, as well as to serve as a meeting and consensus-building forum for its OTPs. As more individuals learn the features of the online collaborative environment (its tools and applications) and best practices for using those features, these types of environments will become a rich resource for many groups and organizations.

Conclusion

This large-scale model was used to conduct the Leader and Battle Staff (LBS) task analysis and produce more than 450 task analysis reports (TARs) which included Task, Descriptions, Conditions, Standards and Performance Steps and Measures for the Army's Future Force equipped with FCS. This is the first time LBS TARs have been produced before the receipt of operational hardware and software for a major Defense Acquisition Program.

How do stakeholders or partners deliver successful large-scale ID initiatives? Everett Rogers in his book, *Diffusions of Innovations* (1995), defined diffusion as "the process by which an innovation is *communicated* through certain *channels* over *time* among the members of a *social system*" (p. 10). This concept is the backbone of implementation.

Rogers further defines an *innovation* as "an idea, practice, or object that is perceived as new by an individual" (p.11). The concept of lead integrator and learning communities of geographically dispersed SMEs was proposed as an innovated form of ID. Systems thinkers may suggest an elaboration to Rogers' definition of *innovation* "what is perceived new by an individual" to include "a group, organization, and system as a whole (Russo-Converso, 2001)."

Inevitable to the implementation of this type of model is the diffusion of innovation. Critical to successful implementation is the understanding that problem/tasks are: increasingly more complex; technology is ever-changing; SMEs have a greater diversity in their experience, knowledge, and skill sets; and learning communities are geographically dispersed and hindered if limited to one/common or shared location (same place, same time) – unless done virtually (any place, any time or in a blended delivery format). A most significant opportunity for those implementing large scale ID initiatives is to use a collaborative model, such as the one described herein, thus breaking through the barriers of geographical locating and capturing of a combined level of expertise only made possible by employing a variety of SMEs collaborating via virtual environments.

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