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| 13. ABSTRACT (Maximum 200 words)<br><br>We conducted several activities to begin research and development on a MAU model to support decision making in training. First, we interviewed training Subject Matter Experts (SMEs) from private and public organizations. These structured interviews enabled us to identify common training decision issues. Second, we began to determine what training tools, aids, guides, probes, and tips are needed to address key issues. We examined several aids that exist in both public and private organizations. Third, we reviewed the scientific and practitioner literature to begin to develop the content and structure of information sources included within the product. This included the development of an index of training terms, the review of meta-analyses, and categorization of current literature. We also developed a prototype of a decision making aid that reflects the research and theory found in both practitioner and research literatures and expertise. |                                                             |                                                            |                                                                                                               |                                                                                            |
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**SUMMARY FINAL REPORT - PHASE I SBIR**

**DESCRIPTION OF A RESEARCH-BASED MAU MODEL TO  
SUPPORT TRAINING DECISION MAKING**

**CONTRACT NUMBER F41624-97-C-5021**

**FOR THE PERIOD ENDING 98JAN24**

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## **Summary Report - Phase I SBIR**

### **Description of a Research-Based MAU Model to Support Training Decision Making**

#### **1. Purpose of the Work**

A review of business periodicals as well as discussions with many of our clients reveal several common trends throughout U.S. business, all related to organizations' capacity to handle rapid and continual change. One compelling implication of this constant change is that knowledge and skill requirements are continually changing and escalating. The on-going development of personnel has become more critical and challenging than ever before. While the importance, cost and prevalence of training have increased, so too has the complexity of the training profession. Training professionals are being asked to perform multiple roles and develop multiple competencies. Often, training jobs are not clearly defined; instead, roles are continually evolving. Many professionals are asked to perform as a mix of instructional designer, performance consultant, facilitator, instructor, technologist, program evaluator, and vendor broker.

Overall, the knowledge demands placed on T&D professionals have vastly increased, while the allowable cycle time for applying that knowledge to solve organizational problems has greatly decreased. These professionals need ready access to a wider range of knowledge than ever before. In solving problems, they need to be able to find and apply information from diverse knowledge domains. As their roles evolve, and responsibilities grow, they need to continue to learn and educate themselves. They need to be able to address new demands, and research new topics, quickly and intuitively. Moreover, they need to be able to apply this knowledge to make informed decisions to ensure that their organizations are ready to address changing competency requirements.

Fortunately, emerging developments in information technology have created an opportunity for addressing these needs in a way they could not be addressed before. Historically, human resource systems applications have progressed from data maintenance and processing (EDP), to management reporting (MIS), to decision support (DSS) capabilities. But the needs documented above cannot be addressed through these types of applications alone. There is a need for a *new* type of application that addresses the emerging needs of T&D professionals -- a Knowledge Information System (KIS).

#### **2. Phase I Work**

During Phase I, our research yielded a clearer picture of the parameters and character of the type of application which we are proposing to develop.

A knowledge information system models a business-critical knowledge domain, and enables users to apply that knowledge to address business needs, solve critical problems, and add value to the organization. The current project proposes the development of a knowledge information system for Training & Development professionals. We refer to this system as **KISMET**, for **K**nowledge **I**nformation **S**ystem for *M*anaging *E*ffective *T*raining. Our Phase I research helped us establish five unique features that we believe differentiate a knowledge information system from other system applications.

That is, our Phase I research and development work has helped us understand the dimensions of what we believe is a new kind of application. Below we describe the unique features of a KIS.

Any Knowledge Information System (KIS) should include:

- A logical, intuitive representation of common problems, issues and/or decisions faced by users
- Accessibility to relevant resources that are needed to be able to perform effectively
- The capability to allow users to attack problems and build their knowledge by pursuing any one of several meaningful “thought streams”
- “Smart-links” among related knowledge areas
- A means of incorporating and accessing new and emerging knowledge

Developments in information technology over the last several years now provide the ideal opportunity to develop a fully functional KIS, without the need to use any untested or high-risk technologies. Some of the key developments include:

- the prevalence of tested tools for writing HTML code which enable smart-links throughout the system
- the evolution of programming languages that allow for the easy graphical depiction of various aspects of the knowledge domain, and enable the user to navigate through various thought streams
- advancements in the Internet and world wide web
- the common availability of company networks and intranets which facilitate information sharing and ease of updating

KISMET will be a fully functioning KIS that would address emerging business and training needs for a vast potential market.

During Phase I, we conducted several activities to begin research and development on the proposed product. First, we interviewed training Subject Matter Experts (SMEs) from private and public organizations. Second, we began to determine what training tools, aids, guides, probes and tips are needed to address the key issues. Third, we reviewed the scientific and practitioner literature to begin to develop the content and structure of information sources included within the product. Fourth, we completed a competitive market analysis, included in the detailed report. Fifth, we developed and tested a prototype of the KIS concept.

### **3. Results: the Prototype**

The KISMET prototype is a working, albeit incomplete, model of a KIS for T&D professionals. It runs on platforms using Microsoft's Windows 95 operating system. The model specifications included high user friendliness and speed of response. The content in the prototype is grounded in T&D research and organized to be relevant to practitioners and users.

KISMET will implement a multi-attribute utility approach to decision making. This approach is well accepted by researchers in decision aid theory. Work on applying this technique to the training area has already been completed by ECG and the U.S. Air Force (Alliger, Tannenbaum, and Bennett, 1996).

T&D professionals in both private and public organizations have a need for quick access to a broad range of information, and assistance in making timely, informed decisions. A Knowledge Information System, with the features we have defined, would meet this need. In Phase I, we began to identify and develop the content for such a system, and developed a working prototype.

### **4. Potential Applications**

For any product idea to be viable there must be: a) a clearly defined and sufficiently large market (market focus); b) a clear need for the product within the market (market need); and c) a willingness and capability within the defined market to be able to purchase the product at a price that offsets production costs and allows for reasonable profit (market capability). A market analysis reveals that KISMET meets these criteria.

In addition to its commercial viability, KISMET will have several ancillary benefits. This project should advance science by enhancing our understanding of training decision making, optimal decision making interface designs, and how scientific findings can best be provided to training professionals to best assist them. We anticipate further developments and understanding regarding the use of MAU models. Additionally, the development of KISMET will advance the understanding of knowledge information systems in general -- which we believe may be a significant innovative advancement.