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EVALUATION OF INTRANET-BASED
END-USER TRAINING

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Abstract

End-user training is a critical factor in the success of information systems. With rising demand for end-user training, organizations are seeking new and innovative approaches for providing low-cost and effective training. Recently, intranet technology has received wide acclaim in the business press as a powerful and cost-effective method for providing *anytime-anyplace* training. Most of these claims, however, are anecdotal in nature. We have used a case study research method to evaluate intranet-based training in an organization. This study relies on extensive collection and analysis of both qualitative and quantitative data to study two research issues: (1) the role of intranet technology in all phases of the training process and (2) effectiveness of intranet-based training. This research expands our understanding of a new and innovative strategy for training end-users. The results of this study will provide a foundation for conducting further research on the role and effectiveness of intranets in providing end-user training. It will also provide guidelines to IS and training managers in evaluating the appropriateness of intranet technology for training end-users.

1. INTRODUCTION

Several research studies have demonstrated the critical role of end-user training in the success of information systems (IS) (Nelson and Cheney 1987). The demand for end-user training is expected to grow rapidly as business organizations increasingly rely on information technologies (IT) to compete in an information age. A recent survey of HRD executives by the American Society for Training and Development (ASTD 1998) identified IT training as one of the fastest growing segments of the technical training field. Organizations spent between 5% and 25% of their total training and development budget on IT training and expected this share to increase in future years. The tremendous pace of change in IT was reported to pose the biggest challenge in providing quality and timely training. Measuring the effectiveness of IT training was another challenge faced by organizations. Identifying low cost and effective training strategies that can keep up with technological changes is a major concern of training executives.

Ease of use, cross platform compatibility, organization-wide access, and the ability to handle multimedia data are some of the features that make the intranet a powerful and popular technology for information dissemination and communication within the organization (Bernard 1996). Recently it has caught the attention of innovative corporate trainers as a technology for providing training (Violino 1998). While intranet-based training has received wide acclaim in the business press as a powerful and cost-effective method for providing *anytime-anyplace* training, most of these reports are anecdotal in nature. Very little research data is available to systematically evaluate the use of intranet technology in providing effective training. The goal of this research is to fill this gap in the evaluation of intranet-based training. This is a critical research issue considering the growing importance of providing low cost and effective end-user training. We have specifically addressed the following research issues in this study:

- The role of intranets in end-user training.
- Effectiveness of intranet-based end-user training.

The remainder of this paper is organized into four sections. Section 2 reviews the research on end-user training to put the current study in perspective and to provide a theoretical foundation for this study. Section 3 elaborates on the research issues addressed in this research. The research methodology is described in section 4. Section 5 concludes by reporting the current status and the plan for completing this research.

2. REVIEW OF END-USER TRAINING RESEARCH

Comparing alternative training strategies to identify an effective training method is a major research theme in the IS discipline. While lecture-based training was found to be superior to self-study in enhancing learning (Davis and Davis 1990), no significant difference was found between instruction-based and exploration-based training strategies (Davis and Bostrom 1993). Behavior modeling, which combined lectures with hands-on experience, resulted in superior knowledge retention and transfer of learning compared to other training methods (Compeau and Higgins 1995; Simon et al. 1996). Studies investigating how people learn and its impact on training design found that learning style of a trainee affected his/her response to a training program (Bostrom, Olfman and Sein 1990). Trainees who developed a conceptual mental model performed better than those who formed a procedural mental model (Santhanam and Sein 1994). Learning together using a codiscovery strategy helped trainees form better mental model of the system and resulted in improved understanding (Lim, Ward and Benbasat 1997). A study comparing the effectiveness of concept-based training material with that of procedure-based material found no significant difference (Olfman and Mandviwalla 1994). These studies demonstrate that there is no one superior training method for all situations. The trainer must select an appropriate strategy based on the training context (Leidner and Jarvenpaa 1995).

Research studies have found a positive relationship between end-user training and information system acceptance. Training enhances the user's ability to use an IS and leads to higher system acceptance (Nelson and Cheney 1987). Identification of cost effective training strategies (Fitzgerald and Cater-Steel 1995) and analysis of training needs to enhance training effectiveness (Nelson, Whitener and Philcox 1995) are some of the other important research issues investigated by end-user training researchers.

This study complements the end-user training research literature by systematically evaluating the role of an emerging information technology, namely intranets, in training end-users in an organization. We have taken a comprehensive view of training by studying the role of intranets in various phases of end-user training including design, implementation, delivery, evaluation, and administration of training. We have analyzed the experiences of a wide cross section of end-users, from several functional areas and belonging to several levels in the organizational hierarchy, in learning to use Enterprise Resource Planning (ERP) System software. Thus, this study provides insights into intranet-based end-user training for a complex software system in a real-life situation.

3. RESEARCH ISSUES

The following research issues have been addressed:

- The role of intranets in various phases of training.
- Evaluation of the effectiveness of intranet-based training.

Training is a complex process involving several tasks that can be grouped into a set of distinct but interdependent phases (Mayo and DuBois 1987; Olfman and Mandviwalla 1994). These are requirement analysis, design, implementation, delivery, and evaluation (Figure 1). The trainee population is identified and their training needs are determined during the analysis phase. Training goals are developed in this phase. The training plan is created in the design phase. Training strategy and course contents are determined and test items are developed to meet the training goals. The implementation phase involves implementing the training and test materials using a suitable medium, and training the trainers, wherever appropriate. Several alternative media are available for training implementation. Traditionally, paper has been used for delivering course and test material. Lately, electronic media, such as CD-ROM and intranet servers are gaining popularity because of several advantages offered by these media. The trainees are trained in the delivery phase. Finally, the effectiveness of the training program is evaluated. The feedback loop (shown using dashed arrows in Figure 1) indicates interchange of information between different phases.
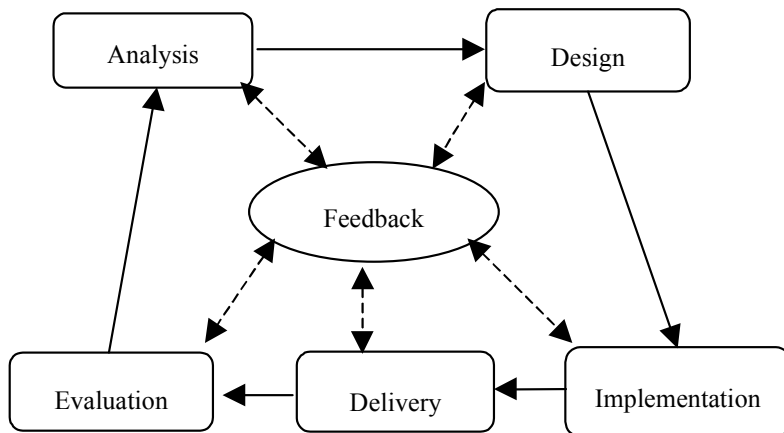
Figure 1. Training Phases

Intranet technology has a number of features that are useful in most phases of end-user training. Requirements analysis, which involves identifying training requirements, is least likely to directly benefit from the use of intranet technology. The versatility of intranets in implementing a wide range of training strategies makes it easy to adapt the training design to meet the trainee's requirements. Based on the locus of control, training strategies may vary from trainer-centric in one extreme to trainee-centric on the other. The trainer controls the pace of learning in a trainer-centric strategy. Traditional lecture-based training is an example of this strategy. It is useful when the trainee has very little or no familiarity with the topic. Computer aided instruction, an example of a trainee-centric strategy, offers the trainee total control over the pace of learning. An intranet-based training program can be implemented using either of these methods as well as variations of these, such as behavior modeling (Simon et al. 1996). Selecting an appropriate training strategy for a given task can enhance training effectiveness.

The rapid changes in IT make content modification and enhancement a continuous process in the implementation phase to keep the training material up-to-date. This task is easily done when the training material is stored in an intranet web-server, as compared to a paper-based medium or CD-ROM. An intranet-based training program can also supplement its own training material by providing access to relevant information on the WWW, a rich source of information on IT.

The global reach of intranets enables the training program to be made available to employees in remote locations of a company. This results in substantial savings related to travel time and cost. This facility of an intranet can be exploited to create a continuous on-demand training program in an organization.

Evaluation is an important phase in training as it provides feedback with regard to the effectiveness of the program. Intranet-based tools are available to evaluate the reaction of the trainee to the program and to test his/her learning.

The second research issue deals with measuring the effectiveness of intranet-based training. We will use the widely accepted model developed by Kirkpatrick (1998) to evaluate training at four levels. The first level measures the reaction of the trainee to the training program. The second level involves evaluating the effectiveness of the program in enhancing the knowledge and skill of the trainee. This is usually measured by administering a test to the trainee at the end of the program. A training program should result in improved performance of the trainee in his/her job. Measuring the transfer of learning to job constitutes the third level of evaluation. Finally, the impact of the training program on achieving organizational goals and objectives is measured in the fourth level of training evaluation. In addition to measuring training effectiveness at these four levels, we also plan to assess the cost of implementing an intranet-based training program. This will provide useful guidelines in evaluating the cost-effectiveness of such training.

4. RESEARCH METHOD

We have used a case study research method in this research (Yin 1984). This method allows the researcher to study various aspects of a phenomenon in its natural setting and enables extensive data collection from different sources. This was considered appropriate because of the novelty of intranet-based training and the exploratory nature of our research. We opted for a single-site design in order to be able to provide a deeper level of analysis (Nelson, Whitener and Philcox 1995). The data collection plan involved using multiple methods to collect both qualitative and quantitative data from various sources.

Focused interviews were conducted with the IT training group, including training designers, content developers, trainers, the technology support team, and the training manager to understand the role of the intranet in IT training. Reports, memos, and other

documentation about the training development and implementation processes were analyzed to cross-reference the data gathered from these interviews. Trainees' reactions to the training program, learning, and transfer of skill were assessed through questionnaire surveys. Selected trainees were interviewed to evaluate the effectiveness of the training program. Interviews with department managers and supervisors provided further evidence about transfer of skill of the trainees. The impact of the training program on organizational goals was assessed through structured interviews with department managers. This data collection plan allowed verification of the findings through triangulation.

5. CURRENT STATUS AND PLAN FOR COMPLETION

The case study site is a leading manufacturer and distributor of telecommunications equipment with worldwide operations. Its head office is located in a southern state. It employed about 1,200 employees and had a sales turnover of approximately $300 million in 1998. This company had decided to replace its legacy information systems by an ERP system from BAAN. This transition required extensive training for almost all employees in the organization on the ERP system. The transition team considered various alternative training strategies and elected to use in-house intranet-based training because of its flexibility and cost effectiveness. A cross-functional training team was set up to design and deliver training programs for the end-users. A total of 1,000 employees were trained on using BAAN and related software prior to the roll out of the ERP system. Currently we are in the final phase of data collection. The project will be concluded before the conference and the results will be presented at the meeting.

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