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A Conceptual Framework for the Electronic Performance Support Systems within IBM Lotus Notes 6 (LN6) Example

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ABSTRACT

The concept of Electronic Performance Support Systems (EPSS) is containing multimedia or computer based instruction components that improves human performance by providing process simplification, performance information and decision support system. EPSS has become a hot topic for organizational development, human resources, performance technology, training, and educational development professionals. A conceptual framework of EPSS is constructed under five interrelated and interdependent domains for educational implications. The domains of the framework are online collaboration, cost-effectiveness, motivation, service management, and performance empowering. IBM Lotus Notes 6 (LN6) is used as an example application tool to illustrate the power of this framework. The framework describes a set of relevant events based upon deductive analyses for improving our understanding of the EPSS and its implications on education and training. The article is also pointed out that there are some similarities between the EPSS' and the LN6's specific features within this conceptual framework. It can provide some guidelines and benefits to researchers, educators, and designers as well.

Keywords: EPSS, Conceptual Framework, Lotus Notes 6, Training and Education

INTRODUCTION

As a type of Computer-Based Technologies, Electronic Performance Support Systems are a way to deliver instruction to personnel in highly computerized work environments with online references, automated decision support, and just-in-time training that they can access on-demand to meet task-related information requirements (Seels& Glasgow, 1998). According to Gery (1991), Electronic Performance Support Systems (EPSS) is an electronic system that provides integrated, on-demand access to information, advice, learning experiences, and tools to enable a high level of job performance with a minimum of support from other people.

The main characteristics of the EPSS are the ability to quickly access well-structured pieces of information, advise, models, and tutorial assistance at the moment of need as determined by the users in the context of the present performance problem (Scales, 1994; Gery, 1995).

EPSS provides electronic support to learners in achieving a performance objective; a feature in which makes it universally and consistently available on demand any time, any place, regardless of situation, without unnecessary intermediaries involved in the process.

The system can include a range of support mechanisms and software tools, including advisory systems to help in structuring tasks and decision- making, and other interactive capabilities with the alternative support mechanism systems. An EPSS is not a software system that contains a specific set of features and functions.

Rather, it is a matter of modifying and developing software to measurability improves human performance. These improvements can be achieved with a variety of software development and enhancement strategies (Collis & Verwijs, 1995).

EPSS is most effective when supporting routine standardized tasks that can be accurately documented and that require standardized actions. Some advantages of EPSS are listed by Seels & Glasgow (1998) as follow:

- **Standardizing training and performance throughout the organization. When the work force is using the same tools, references, and training materials, consistency is maximized.**
- **Reducing the amount of time spent on off-line training, because workers learn on the job.**
- **Updating information on an immediate and consistent basis.**
- **Reducing errors, because all workers have immediate and constant access to expert support. (p.117)**

A number of studies focused on the practical domains as the solutions of problems and the applications of EPSS in business, management, medicine, and education (Thousand et al., 1994; Marion, 2002).

They also argued that EPSS can be developed to support teaching and learning in different educational settings (Law et al., 1995; Kirkpatrick, 1998). The educational implications of the EPSS are the essential interest point of this study. In this view, Magliocca et al., (1993) and Marion (2000) expressed that EPSS has the following educational impacts:

- **increased participant awareness and openness,**
- **changes in professional and paraprofessional practices,**
- **increase integration,**
- **increased coordination, communication and collaboration,**
- **changes due to parent participant,**
- **consistent user satisfaction and proficiency.**

Discussions on the EPSS environments are focusing on the nature of the training/learning systems and their educational implications in practice (Dorsey et al., 1993; Goodrum et al., 1993; Marion, 2002).

Based on the literature, the following Table 1 showing the main practical domains of EPSS. They are environment, people, guidance, technology, and work practice.

The Table: 1 summarizing some of the general concepts supporting to the EPSS related features and showing how such features tailored the general framework of EPSS environment in practical examples.

Table: 1
General Domains of EPSS and their Features in Practice

General Domains	Features	Examples
Environment	Electronic artificial software system; Virtual training for performance support; On/in the job tool; CBT, CBI, Distance Learning Technologies; Information in the form of databases; Support achieving a performance objective	Some software programs and their application systems or servers (Oracle 9.i Collaboration Suite, Microsoft SharePoint Portal, Lotus Notes 6, Mac OS X and its applications, Cleaver Path and so on); Text, visual, audio, and knowledge databases; Expert systems help problem solving and decision making; Virtual learning/training classrooms.
People	Any individual or group of people	Students, learners, audiences, workers, employees, any user need performance support
Guidance	Advise system, expert systems, directions and help opportunities	Example case studies including on line help and support, e-mail, chat, web, phone and faxes communications or collaborations; Spreadsheet applications, help systems give demonstrations; Assessment systems evaluate skills, and feedback systems
Technology	Computer hardware, software and, mindware; Networking, www, and database systems	Software programs, simulations, multimedia application; Electronic information and management tools, internet and www; An interface that facilitate the use of applications that require a variety of software
Work Practice	Standardized specific tasks and actions; Performance problems and activities for specific subjects, topic, and, jobs; Tracking performance and recording data	Broadcast, reference and discussion applications; Conflict resolutions and problem solving; Satisfy users; Customers' or learners' needs; Enriched learning and training, performance appraisal

Environment, technology, people, guidance, and work practice are the five general interactive domains of the EPSS. Each of the five domains combines a number of sub-terms mostly emphasized as the features of these kinds of environments that are richly explained in the previous studies (e.g. Goodrum, et al, 1993; Schwen et al., 1993; Bayram et al., 1996; Bayram & Crossman, 1997). However the above Table 1 presents the general practical domains and their features, it is not enough to explain all the EPSS processes from the educational and training point of view. There is a need for a visual model to see at a glance the nature of the main process and its sub terms. Also, it would be helpful to make operational definitions of the terms for better explanations and analysis within the system. In this view, Table 1 could be helpful to shape the construction of a conceptual framework within this context. It is also helpful to look at the foundations and the sources of EPSS and their possible practical examples for learning. Sophistication in EPSS technology and a thorough knowledge of human performance may lead to a deeper understanding of the technology-user interface and eventually to the development of a framework capable of

assessing the processes, not the products, of on/in the job training and learning activities. Meanwhile, we do not have a conceptual basis for understanding how and why they occur

The role of frameworks in the EPSS is to provide conceptual and communication tools that can be used to visualize, direct, and manage processes for generating episodes of guided training and learning. It is a fact that there is no study focused on the conceptual framework of the EPSS within a software application example.

There is a need to analyze this type of frameworks for well understanding, satisfied explanations, qualified developments, and future productions of the system. From these reasons, constructed a conceptual framework is an important step for the continuance and the future of the EPSS. Thus, it is time to experts to explore some promising conceptual approaches that might help make sense of the effects of collaboration, social context, work practice, guidance, and performance appraisal in electronic training and learning. Based on the previous studies in literature (e.g. Gery, 1991; Goodrum, et al, 1993; Dorsey et al., 1993; Schwen et al., 1993; Gery, 1995; Bayram et al., 1996; Bayram & Crossman, 1997; Bayram, 2004), The author has synthesized a Pentagon Model showing the general conceptual domains of these kinds of EPSS environments.

In this view, the general perspective of this study is to develop a set of conceptual construct that provide descriptive power for explanation of EPSS and its features for educational and training activities. The essential conceptual domains and their features are presented in an abstract form within the following framework. Presented concrete EPSS examples for specific subject groups in practice or given example EPSS case studies for standardized tasks and actions within any software could be a further step of this study.

THE FRAMEWORK

The conceptual frameworks are based on assumptions about tasks and the order of tasks. Always questions these assumptions. Like all models, the frameworks are not reality, rather they are a way to simplify and make reality visible (Seels and Glasgow, 1998). They are adaptations of the generic studies. This is because a framework must be modified to fit specific situations or locations. Based on the researcher's technical expertise, software knowledge and training applications in practice, Lotus Notes 6 (LN6) specific environment is chosen as an example software to fit such specific situations and localities in this study.

Conceptual frameworks stem theoretical models which are analytic in nature and typically describe the relevant events based upon deductive processes of logic and analysis (Hoover, 1984; Richey, 1986). Thus, the conceptual framework is prescriptive in nature, serves as guides to the solution of specific problems in analytic manner, and has an abstract theoretical basis for understanding how and why EPSS has significant effects in educational applications.

Actually, the following framework should not be viewed as the only way retrieve information in the EPSS for such applications. Given the evolving and the environment, there are many ways in which the process could be engaged in the EPSS. In this perspective the following conceptual framework can serve a number of purposes in practice:

- **It visualizes the nature of the EPSS and its training/educational environment, thus allowing those involved to reach consensus on that process.**
- **It provides a tool for managing the process and project.**
- **It allows the users to test concepts by integrating them within a practical model that can be applied.**

- **It sets tasks for the EPSS designers that can be used as criteria for good design.**
- **It can help the instructional designer make decisions about the nature and scope of instruction.**
- **It can be tailored to meet individual needs by providing alternate paths through the course of study and by building in remedial instruction for those who need it.**

In this view, the Figure 1 visualizes a basic conceptual framework showing the specific features of general domains of EPSS for training and educational implications in general.

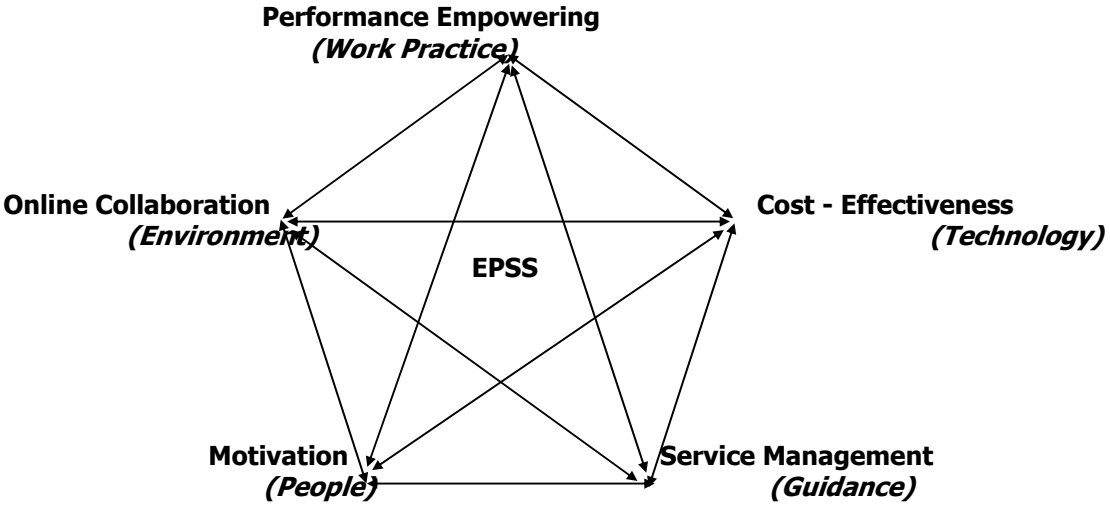

Figure1. A Conceptual Framework of EPSS

Similar to general domains (environment, people, guidance, technology and work practice), the conceptual framework of the EPSS is also classified and explained under the five interrelated and interdependent domains which are:

- **online collaboration,**
- **motivation,**
- **service management,**
- **cost-effectiveness, and,**
- **performance empowering.**

Each interrelated conceptual domain represents a specific practical feature in the interactive application domain. In this view the following Table 2 showing the relationships among the general features (domains) of EPSS, the conceptual framework domains and their features within the Lotus Notes 6 (LN6) examples. The author uses LN6 as an example application tool to illustrate the power of this conceptual framework.

The author's technical knowledge and experience effected such selection. It is possible to do similar analyses by the way of Microsoft SharePoint Portal, Oracle 9.i Collaboration Suite, CleverPath Collaboration Option, Mac OS X v 10.2 and the other types of software systems. Existence system in my job setting and the past training activities guide me in this decision.

The general domains of EPSS (which are explained in literature as mentioned before) give birth to such framework and its new domains. There is a close relationship between each general domain and its correspondence to conceptual domain as seen on Table 2.

Table: 2
The Structure of Conceptual Framework

The Roots: General Domains	Conceptual Domains	The Features in LN6
Environment **(EPSS Training/learning option)**	**Online Collaboration**	**Build a virtual learning community, provide collaboration, cooperation, and effective communication by the way of collaboration mechanisms such as e-mail, mail list, newsgroup, forum, chat, response pad, whiteboard, screen sharing, audio/video conferencing. Provide online databases for performance support and achieving objectives. Have expert systems help just in time problem solving and decision making on/in the job (school) setting.**
People **(Learners/users)**	**Motivation**	**Provide self-regulation, learner control, communicate enthusiasm, effective virtual teams, free of bias and stereotyping, and treated equality by the way of motivated forces and positive motivators such as pride among coworkers (users), collecting credentials, fun experience, joy of learning, no need to travel, independence and flexibility, token gifts etc.**
Guidance **(Help, directions & advise system)**	**Service Management**	**Set self- management, decision making, real world examples and case studies, and self-reliant by the way of technical tools advise or expert systems and factors such as search engines, browsers, navigation, orientation, hypertext links, speed-bandwidth, visual layouts, user controls, feedback, help guide, options, storing data, privacy, security, and safety,**
Technology **(LN6 and its learning space systems)**	**Cost-Effective**	**Provide easy to use and learn, overcome technical hurdles, time consuming, reduce training costs such as travel, facilities, administration, salary, per-class costs, per-learner cost, total cost, and lost time.**
Work Practice **(Performance support& appraisal, specific task training & learning)**	**Performance Empowering**	**Create performance appraisal, customer/user satisfaction, increase team work, conflict resolution and need satisfaction, provide enriched learning and training by the way of specific activities such as webcasts, presentation sequences, drill-and-practice, guided research/analysis scavenger hunts, team design, brainstorming, role-playing scenarios, virtual laboratories, learning games, group critiques, hands-on activities.**

The Table: 2 showing the roots of the conceptual domains within the conceptual framework and their features within the Lotus Notes 6 example for implementing EPSS. As it mentioned before each of the five interactive domains of the conceptual framework combines a number of features. The relationship among the domains is not linear, but synergistic. Each domain contributes to the other domains in practice and to shapes to the other in theory. This descriptive conceptual framework explains a set of descriptions as to which outcomes occur under given conceptual conditions for a given EPSS model for training and educational activities within the LN6 example. In this view, LN6 is used as an example software

application tool to illustrate the power of this conceptual framework and its interactive domains. The presentation of a specific case; including the features, the task problems and the solutions; is the subject of another research coming as a second step of this paper. In this view, online collaboration, motivation, service management, cost-effectiveness and performance empowering domains of the framework are explained within the literature studies and LN6 software example knowledge as follow.

ONLINE COLLABORATION

Online collaboration is a new world sparking with potential for effective learning experiences. In the EPSS, learner or users can use e-mail, discussion groups, chat, virtual response pads, and conferencing to exchange messages as a part of formal learning activities. Online collaboration can energize learners, promote deeper learning, and make learners more self-reliant. In this view, collaborative learning is learning based on interaction with others, learners or instructors. The instructor guides the learners through interactive online learning, such as shared whiteboards, shared application software, electronic hand-raising, chat functionality and audio/video over the network. These advances in technology allow us to reach higher levels of learning than was possible with basic Computer-Based Training (CBT).

Likewise, groupware tools of the EPSS and the LN6 provide collaboration, communication, coordination, and cooperation for education and training in the community (or school); and their collaborative environment improve satisfaction and proficiency during the teaching among the users (or learners) (Diospatonyi, et al., 2000, IBM Lotus Software, 2003). In this view, LN6 to deliver three modes of electronic learning in EPSS environments. They are:

- **Self-directed learning: where learners can register and access learning content in a traditional CBT/ CBI environment.**
- **Collaborative asynchronous learning: where learners and instructors can interact and participate in class activities, at their own schedules and convenience.**
- **Collaborative, live learning: where a real time virtual classroom environment allows instructors to share content with learners quickly and easily.**

LN6 has a number of general features for educational purposes such as text handing, reports, news, information integration, standard database interface, simultaneous user access to flexible databases, multi site access to identical data, and integrated electronic mail (Borthwick, 1993; Liberman & Rich, 1993; Tung, et. al, 2000; Marion, 2002; Haxel, 2002). Applications of LN6 include tracking application, broadcast applications, reference applications, and discussion applications (Perez & Rojas, 2000). Several people (students) in the separate locations (i.e., computer labs) can work on a single document by the way of LN6 applications. Batey and Allen (1994) stated that it allows for collection of information in a central location, making it accessible to a group of users. As a collaborated learning environment, users have immediate access to documents through the full-text searching capability (Bong, 1999; Diospatonyi et al., 2000). Also, online collaboration via telnet or electronic communication is an effective way to improve the educational or training environments (Webster et al., 1993; Honcock, 1997; Lohrke et al., 1999).

As Gery (1991) pointed out that EPSS have different kinds of databases such as text, visual, and audio. Text databases have online reference, contains content in various structural forms such as procedures, policy and product information, concepts, glossaries, and stored images of text. Visual databases have libraries of pictures, schematics, diagrams, graphics, maps, and full-motion video. Audio databases have libraries of sounds, voice sequences, and music.

All these databases will be technically stored and organized using hypertext tools, online documentation software, database management systems, and so on. In this view, LN6' online collaborative environment provides all kinds of databases (text, audio or visual) to the user (students) for educational and training activities.

On the other hand, environments for all learners need to be emotionally secure and physically safe. Magliocca and others (1993) pointed out that:

- **secure relationships enhance collaborative online learning, and training**
- **accurate, understandable information enhances the learning environment, and**
- **autonomy and decision making abilities via online performance support increased learning.**

During the LN6 applications, the mature personal relationships and accurate, understandable online information can also enhance the feeling of safety in this kinds of learning and training environments (Computer Security, 1996). Within this type of secure learning environment, there is an opportunity to learn from each other with LN discussion applications (IBM Lotus Software, 2003). With online collaboration, learners "feel more empowered". They are daring and confrontational regarding the expression of ideas (Kubala, 1998, p.73).

MOTIVATION

Motivation is often overlooked and underrated as an important learning factor. There are a number of strategies, such as:

- **make the presentations meaningful,**
- **use positive reinforcement,**
- **provide feedback,**
- **pace of learning,**
- **provide practice and so on,**

Trainers (users or students) can use to create a productive motivating environment. Human productivity is a function of both one's ability and one's motivation to perform (Keller and Litchfield, 2002). In the Performance Factors Model, Keller (1992) describes three interrelated factors that influence human performance: motivation, capability, and opportunity. Opportunity is represented by role match, resources, guidance, and training (i.e., EPSS provides guidance and training with its unlimited online resources). Capability is represented by abilities, knowledge, and skills (i.e., as a solution of a problem draw a graphic on the screen and share it with a classmate by the mail then discuss the possible future collaborations for productivity). Motivation is represented by personal characteristics (such as internal curiosity, values, and expectancy for success) and environment influences (such as job complexity, leadership style, and role definition).

As an example of EPSS, in the LN6 learning environments users gain satisfaction through three sources in which provide pleasant, enjoyable, and successful experiences. In this way, natural consequences are intrinsically satisfying to the learner. They are achieved through opportunities to solve real world problems presented as case studies or simulations in the collaborative LN programs. In this view, LN6 can also serve to the users (i.e., students) to take any kinds of creative online exam providing discussions, information exchange, or cooperation in the work (school) setting. In this way, users can share their information or answers or they can use example case studies in order to design their possible solutions to

the problems in an effective and efficient way. Also, extrinsic motivators such as praise or reward also provide positive consequences. From Keller's point of view, it can be said that the EPSS environments arouse users' attention level and sustain it effectively. Analogies in the LN6 program also make it relevance to the learners, and increase program instrumentality. Learners feel confidence because they satisfy their expectancies; and intrinsic or extrinsic motivations increase their satisfaction.

Learning control also can assist learners in development of self-regulation by providing the opportunity to discover and refine strategies in the EPSS environment. Schnackenberg & Sullivan (2000) suggested special considerations for learner control strategies that allow learners to select contextual properties of lessons according to individual learning styles, preferences, and interests. From the learner control point of view, Borthwick (1993) and Chandler (2000) pointed out the importance of self-efficacy and self-regulation in the LN environment. Self- regulation and learner control options increase users motivation in these kinds of EPSS learning environments. Learner autonomy is essentially a matter of the learner's psychological relation to the process and content of learning in LN6 (IBM Lotus Software, 2003). It combines a wide variety of behaviors as a capacity for detachment, critical reflection, decision-making, and independent action (Joo et al, 2000).

The potential utility of an EPSS within LN6 situation will depend upon the characteristics of both user population and the learning tasks that are to be performed within the learning or training applications. The learners or users need to achieve high levels of proficiency very rapidly. Similarly in the context of task characteristics, situations (Lotus Notes 6) in which the use of an EPSS can be advantageous include: infrequently performed tasks; tasks involving large amount of information; tasks involving multiple steps; applications or procedures that involve extensive functionality, and tasks requiring diverse knowledge.

SERVICE MANAGEMENT

EPSS service management require observing user (learner) activities and informing users about the appropriate of their actions within software (e.g., error messages or conditions and related instructions) or track user activity to determine whether and when assistance or information is needed. These monitoring systems can be rule-based or simple tracking mechanisms that observe actions and prompt users based on context, activity, time factors, and so on. On the other hand, successful instructional management strategies (i.e., the combination of learner control, self regulation, and motivation) are necessary for the effective use and design of instruction, the effective utilization and preparation of instruction in a service provide learners with great benefits in managing online instruction. Such management strategies is also important to develop self-management and learner control skills in a training or learning environment like as LN6.

As an important issue of service management, decision- making is one of the main points for improving effective communication and the information learning process in these kinds of EPSS organizations or services. Cassidy and Kurfman (1977) contend that decision -making is the making of reasoned choices from among several alternatives in a service. Reasoned choices are based on judgments which are consistent with the decision-maker's values. In their model, they distinguish three stages:

- **identifying decision occasions and alternatives;**
- **examining and evaluating decision alternatives, and**
- **deciding and reflecting on the decision.**

While the decision-making process incorporates aspects of the scientific method, it focuses on the choices made by people involved in the learning or training process. Scales (1994) suggested that educators and instructional developers need to create participatory activities which teach learners how to act upon their decisions in an organization. He also recommended role- playing, simulation, games and case studies as successful techniques of teaching decision-making. In this view, research studies using LN emphasizes the role of the decision making in education and training. Tung et al., (2000) argued that LN environment provide examples and creative alternatives solution models to the problems for reflecting on the decisions of its users.

LN6 is also the leading provider of any kinds of Information Technology Service Management solutions - including systems, software, consulting and training. LN6 comprehensive education solutions can help user or learners develop the knowledge and skills necessary to implement an integrated IT management solution. In this view, it is possible to combine world-class knowledge of network, system and application management, a broad portfolio of training and education life cycle methodology to deliver the right solution for any learning needs. Service management options of the LN (or EPSS) database environments give the managers an important keystone role to a successful change process (Lohrke, et al., 1999). In these environments, managers broaden their roles to include the facilitation of team-building activities, and the discovery of new ways of supervising and measuring learners' performance (Dorsey, et al., 1993).

A number of studies focus on the LN as the practical example of the EPSS' environments. From these perspectives, Bates & Allen (1994); Liberman & Rich (1993); and Ortiz, et al., (1999) discuss the applications of the LN in the database management systems, library automation, information networks, and public relationships. They describe the transformation of the Lotus Development Corporation's corporate library from a paper-based information service to a virtual library using LN as the underlying development platform. Because of its structural nature, LN6 (or EPSS) environment provides a vehicle for understanding how knowledge is transformed by the social relationships (or by the way of chat, e-mail, teleconference, videoconference activities) and conflicts within the evolving team (Haxel, 2002). Cognitive changes emerge out of the dynamics of teamwork that represent "new learning." the result of the process of collaboration and sharing in the interdisciplinary team.

COST-EFFECTIVENESS

Cost-effectiveness features of EPSS could be explained from different point of views such as systems, organizations, design and technology, learning and users. EPSS as a computer based systems contains functions for collaboration, coordination, and communication of group in an organization (Ellis, et al., 1993; Skyrme, 1997). From the *systems* perspective, organizational understanding is required to accomplish successful changes in required skills, knowledge, attitudes, abilities, and associated performance which will work in an organizational context of different strategy, structure, power, networks, and systems of a specific environment.

For organizations, EPSS requires a sophisticated combination of hardware components, information databases, and compatible computer technology, all of which is expensive. A large number of business and industry training departments have found these networks to be cost effective when a significant number of users are required to be trained. Several companies have private networks installed that report cost savings even when the sizable initial investment can be accommodated (Lohrke, et al., 1999). The most time-and labor-intensive part of working with LN or EPSS database is the *design* process and *technological*

development. Once a database is developed and added to the network server, it is easy for additional users to add the icon to their desktops. Also, it is worth nothing that access to sensitive information (e.g., learner evaluations, strategic planning documents) can be restricted to specific users. From these perspectives, designing program for training is expected to achieve effective and efficient change in human performance. New technological developments and design alternatives both permit and require a change in performance and achievement during the electronic learning. Fast, inexpensive, large memory and networked hardware is available. It permits new ways of software and sophisticated user interfaces.

In the Lotus systems, design issues are structuring development and integration. Data communication networks, mass storage devices, and new software development technologies are giving birth to new mind-sets (IBM Lotus Software, 2003). With the mass customization and intelligent workstations, the ability to tailor products and services to individual users' expectations and needs in a time frame is virtually immediate within EPSS (Gery, 1991; Gery, 1995). From this point of view, LN6 environments combine these training issues for interactive electronic learning, performance support; and performance empowerment.

New learning and information access are developing for decision support models and empowering of human performance in the training programs via new design alternatives. They are important in that they effectively represent a new type of system interface that requires less knowledge and skill on the part of the *users* in order to perform complex, multi-variable tasks. For example, research on organizations that have proven successful training programs list management's active support as a key element for the success of any program (Thomas, 1987). Active support requires modeling, holding employees accountable for training and evaluating them, attending and participating in training programs, and reinforcing new behaviors on the school. Lotus Notes provides such active support to its users (students). It also is focuses on learning through guided experience to enhance meta-cognitive skills for learning processing. Goodyear (1995) offered some instructional strategies and methods (such as, coaching, reflection, scaffolding and modeling) for cognitive apprenticeship during problem solving and effective decision making in general. These strategies are used in the LN program by the designers for improving cost effective EPSS learning environments (Tung et al., 2000; Borthwick, 1993). From the above point of view, it can be said that designing the strategies and methods also provide effective training in the LN6 program environments. They permit automated, interactive design and representation of complex data, complex and interrelated processes, and the link to entities (functions, users, departments, etc.) via a set of structural design representation and sophisticated cost effective programs (Lohrke, et al., 1999).

LN6, as a tool of EPSS applications, is effective and efficient for reducing time and increasing the level of training quality. The ability to combine support and education with the actual task will allow new levels of productivity in learners of varying levels of skill (Goodyear, 1995). From these perspectives, LN collaborative environments require linkages among and between functional counter pacts such as training, documentation, expert system developers, and subject matter experts within an organization (IBM Lotus Software, 2003). With its cost- effective feature, LN6 environments can offer instructional technology, organizational development, and performance appraisal for behavioral change, effective instruction, learning, and performance empowering in education.

PERFORMANCE EMPOWERING

Performance empowering is the process of identifying, measuring and developing human performance or success in the organization (Chandler, 2000). For this reason, Bielawski and

Lewand (1990) devote considerable attention to understanding and selecting alternative development tools for performance appraisal. They are more effective and economical than the traditional training methods. On-the-job Training, off-the- job Training, and Computer-Based Training are among the examples methods. Their approach focuses on four points of learning environments:

- **the applications environments or what you are building,**
- **the development environment or technological considerations,**
- **the user environment or the user interface, and**
- **the run-time environment or the delivery environment.**

Improving Human Performance is the core of the performance appraisal and empowerment. According to Collis and Verwijs (1995), becoming empowered means learning how to influence and interact with the challenges of one's life in such a way as to maximize performance. From this perspective, training has become a tool of organizational development rather than the reverse. Organizational development is a long -range effort to improve an organization's problem solving and renewal process, particularly through a more effective and collaborative management of organization culture (Ellies et al., 1993; and Mayer, 1998).

Educators concerned about the empowerment of learners have seen that a restructuring of schools may be necessary if empowerment of learners is to be realized (Heinich, 1973; Reigeluth, 1993). Learner should be seen as producers of knowledge and teachers as managers of learning experiences (Murphy, 1991; Watkins & Lusi, 1989). Learners should be at the heart of restructured educational processes. These processes help all learners learn how to learn and should empower learners now and for the rest of their lives (Bereiter, 1995). However, how the learners become empowered? How do they learn how to respond to the challenges of their lives in a manner to maximize performance? In order for them to become empowered, educators have to intervene. Educators should understand the development process of learners and know how to be established an EPSS learning environment that will maximize a learner's capabilities. Keller (1992) takes the view that human performance is influenced by three major factors: motivation, capability, and opportunity. More specifically in educational settings, Keller and Litchfield (2002) states that learner control, self-regulated learning, and continuing motivation will be required to ensure that instruction is effective and that learners are successful. With their technical, informational and motivational opportunities, LN6 electronic information environments can provide performance empowerment and on-line collaborative support in education and training.

Performance empowerment would necessarily involve a consideration of learner control in EPSS environment. Learner control is widely believed to be highly desirable feature of any kinds of interactive learning environments because it allows learning to be highly individualized to each learner's needs (Schnackenberg and Sullivan, 2000). Likewise, Lotus Notes lets learners make decisions with respect to their learning. Each learner's control of instruction is inherently appealing to learners, since it is assumed that learners will be more motivated if they are allowed some control over their own learning in the Notes environment as a result it provides empowerment. It also provides leveraging of human resources, because it is:

- **a communication tool,**
- **handling large amount of data,**
- **increasing teamwork,**
- **focus on user or customer needs,**

- **resolving conflicts between customer requirements, and**
- **providing customer satisfaction (IBM Lotus Software, 2003).**

From these perspective, Lotus Notes electronic environment provides performance empowering human group performance by its online collaborated feature in the EPSS context.

CONCLUSION

Frameworks are the products of man's thinking while they do not exist in nature as atoms; they supply models within which concepts and linkages or relationships between them. They do not represent the process exactly as they occur in reality. Framework as a representation of reality presented with a degree of structure and order. Hoover (1984) and Richey (1986) stated that conceptual frameworks are coming from the theoretical models that are analytic in nature and typically describe the relevant events based upon deductive processes of logic and analysis. Based on the main practical domains of EPSS, a new conceptual framework is constructed for the EPSS using LN6. Within the conceptual framework, the implications of the EPSS are classified and explained under the five interrelated domains which are online collaboration, motivation, cost-effectiveness, service management, and, performance empowering. The conceptual framework is prescriptive in nature, serves as guides to the solution of specific problems in analytic manner, and has a theoretical basis for understanding how and why EPSS has significant effects in education and training. The benefits of this study could be listed as:

- **Share the knowledge with the educators and researchers**
- **Increase the common interest to the topic and provide future collaboration options**
- **Visualize the abstract nature of the EPSS for better understanding**
- **Clarify design issues and features of EPSS and help the ISD designers for future development**
- **Show the nurture of its practical domains and explain the characteristics of its conceptual domains**
- **Give some example applications for the EPSS learning environment and clarify the EPSS specific features within a software example**
- **Provide conceptual standardization for terminology to the future studies.**

Both the literature review and the researcher's observation data show that there are some similarities between the EPSS' and the LN6's specific features as mentioned above. Within this context the learning environments of the EPSS and the LN6 are matched at the same point for training and educational purposes. They are interrelated and interdependent of each other in these interchangeable learning contexts. The names of the domains (online collaboration, motivation, performance empowering, service management, and cost-effectiveness) are selected from the literature review and explained within the LN6 example studies. LN6 has many features that could be put to service for implementing EPSS, but technology itself does not provide support it. Someone needs to develop an organization that empowers users (employees, trainees or learners) with EPSS design information systems that provide appropriate support, and manage users in a way that they use EPSS.

In this context, the study is explained the nature of the EPSS training and educational implications within the conceptual framework. However it has an abstract structure, it can provide some guidelines to the researchers, educators and designers as well. Experience in applying the conceptual framework methods for EPSS analysis is needed for validation. In this view, research is needed to better understand and assess the role of conceptual

framework of the EPSS within the LN6 or another software example environment in improving training-learning process as well as user outcomes.

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