

# TRAINING IS THE KEY TO IMPLEMENTING A GROUP DECISION SUPPORT SYSTEM

**Dr. Heidi R. Perreault**

Southwest Missouri State University  
College of Business Administration  
901 S. National  
Springfield, Missouri 65804-0094  
(417) 836-5616

***ABSTRACT:** Group decision support systems (GDSS) are software packages that provide support and structure to the group decision making process. GDSS technology is often referred to as groupware. Groupware provides members of a work group with the ability to share documents, to communicate easily with one another, and to use decision support aids such as PERT charts and budget allocation models. Middleware is a new term used to describe high-end GDSS products. They add interfacing capabilities to the communication and decision support aids found in traditional groupware products. GDSS products are being introduced into an increasing number of organizations. Training in the use of a system is a crucial step in getting workers to accept and adopt a GDSS as a means for making decisions. The training should include the principles of group dynamics and the use of decision support aids as well as instruction on the intricacies of the specific GDSS product.*

***KEYWORDS:** Group Decision Support Systems, Groupware, Work Group Computing.*

## INTRODUCTION

The term personal computer is quickly becoming a misnomer. A PC is no longer a "personal" tool. It is a networked workstation. Although PC users have had access to networks for a limited time, the use of networks is changing. In a traditional networking situation, users accessed a data base and used the information to solve a problem. The network allowed multiple users to have access to the same information base. Today, networks allow members of a work group to solve, interactively, business-related problems. Consequently, the reason for networking PCs has shifted from information access to group interaction and joint sharing of information. Software products designed to facilitate this group process are called Group Decision Support Systems (GDSS).

Group Decision Support Systems provide structure to the group decision making process. The goal is to improve the group process by removing communication barriers, providing decision making tools, and adding structure to group meetings. A formidable task facing those wishing to incorporate a GDSS is the uncertainty potential users feel about the technology. Unsuccessful attempts to implement GDSS are typically due to an unwillingness on the part of workers to devote time to learn the system, a lack of understanding as to the purpose of GDSS technology, or a lack of top management support. (1)

For a GDSS to be successful, the organization must provide workers with an orientation to the software and to the purpose of Group Decision Support Systems. Since GDSS alters the way

individuals interact within a group, a period of adjustment and resistance is normal. For group members to accept this new procedure, they need to be committed to the collaboration process as well as have support from top management. (2)

Students within a collegiate school of business will benefit from an introduction to the technology since they can expect to encounter GDSS and to be assigned to group projects upon entering the workforce. Instruction, whether designed for workers or students, should focus on the purpose and use of a GDSS.

## AN OVERVIEW OF GDSS TECHNOLOGY

Groupware products have evolved from the simple transfer of documents (electronic mail) to a joint sharing of

documents. A typical example of a groupware product is the revision of a joint document. Some groupware products limit access to a document to one member at a time. Others offer real-time, simultaneous interaction that allows multiple users access to a single document at the same time.

As one group member alters the document, the other members see the original document plus the proposed changes on their computer screen. Or, as one member alters one segment of the document, another member(s) works on a different segment. Documents can include text, image files, graphics, and in some cases video and sound. Depending on the software, members may communicate with one another through the software (using the keyboard) until agreement is reached, or they may use the telephone to speak to one another while viewing the document and the proposed changes on their computer screen.

As users become more comfortable with the editing and sharing capabilities of the software, productivity gains can be expected. For example, Burroughs Welcome, a pharmaceutical manufacturer, uses groupware to produce detailed research reports. The company has experienced as much as a 50 percent drop in time needed to process a report since implementing groupware. (3)

A second popular use of groupware is to support group planning sessions. Some organizations have designed a decision center where group members meet. Each

member enters information at a computer console and views the combined work on a shared overhead screen. This process works well with brainstorming sessions. Group members input information without concern for group member status or possible conflict since the input remains anonymous.

Burr-Brown, a manufacturer and distributor of electronics parts, uses this approach for its annual strategic planning meetings. The benefits cited are increased involvement and a more effective planning process. (4)

Decision support aids such as budget allocation models, probability assessment models, statistical methods, and PERT charts are included in some groupware products. Such added features allow group members to study the anticipated impact of a decision by inputting variables into a financial model. For example, if one of the options being considered was an increase in sales force, the resulting impact on sales and profit over a set time period could be calculated. The decision support aids assist groups in the decision-making process by reducing uncertainty.

Another feature found in some high-end groupware products is communication structure. The software monitors how the group interacts by incorporating Automated Parliamentary Procedure or Robert's Rules of Order (5) which provides a means for controlling conflict. For example, a member polls the system when wishing to provide input. The system decides who will be given "the floor" and sets time limits for

speakers. The goal is to provide a means for a group to make the necessary decisions with minimum conflict and with as few distractions as possible.

Middleware is a term used to describe the newest GDSS products on the market such as Lotus Development Corp.'s Notes and Collaborative Technologies Corp.'s VisionQuest. These products include the communication ease and decision support tools available to groupware users and adds more communications support.

Middleware facilitates communication among multiple operating systems platforms. The software uses protocol translation to provide the necessary interface between a network and an application package or between multiple network servers.

Middleware allows group members access to information stored on networks outside the network supporting the middleware package. For example, a group member could "pull in" information from other projects that is stored in different data base files. The middleware product, which stores information about the configuration of the participating PCs, LANs, and gateways, acts as an interface between the differing protocols. The translation is invisible to the participating group members.

### A TRAINING PLAN FOR INTRODUCING GDSS

One way to judge the success of a GDSS is to record the time required to solve a problem prior to and after implementing the system. In a joint project, IBM and the University of Arizona documented a 56 percent savings in work hours for experienced users. (6) Furthermore, users perceived the system in a more positive manner as they gained experience. Additional findings indicated that participants stayed focused on the task and that fewer meetings were required.

The key aspect of the documented results may be the term "experienced user." Novice computer users or those who do not typically work in a group setting fail to use the technology to full potential. They are

**Figure A: GROUPWARE PRODUCTS**

<u>Groupware Product</u>	<u>Software Company</u>
Notes	Lotus Development
VisionQuest	Collaborative Technologies
Aspects	Group Technology
Timbuktu	Farallon Computing
Carbon Copy	Microcom
New Wave	Hewlett-Packard
Higgins	Enable Software
Coordinator	Action Technologies
NetWarE	Novell
Meeting Maker	ON Technology
ForComment	Access Technology

less willing to invest the time necessary to learn to use the technology, less likely to participate fully in the decision-making process itself, and less willing to accept technology as a means to improve the decision-making process. (7)

The amount of training depends on the background of the trainees and the level of GDSS available.

### **Setting the stage**

Prior to any training on using a group decision support system, trainees need exposure to the principles of group dynamics and at least a minimal proficiency in using application software packages.

Group dynamic exercises appropriate for college students and business professionals can be obtained from a collegiate-level organizational communication textbook. The exercises emphasize the need for all members to work together to solve a problem. They provide practice in establishing a group commitment, managing conflict, setting priorities, and obtaining closure. A commitment and understanding of the

group process is necessary before proceeding to training on GDSS technology.

Exposure to whatever application software packages the GDSS supports is important. Typically the user must be able to use word processing, spreadsheet, and data base management software. The trainee also will need exposure to operating in a networked environment. A basic computer literacy textbook will provide exercises or an on-line training package may be used for individualized learning.

### **Providing groupware training**

The most elementary level of groupware is electronic mail. Since GDSS users should have had some exposure to e-mail, a single exercise allowing trainees to use the GDSS software to share information should be sufficient.

First, provide a demonstration of how the electronic mail function works and detailed instructions on accessing the electronic mail system, creating a message, sending a message, and reading an incoming message. The less experience the trainees

have had using computers and networks, the more hands-on training time required. One goal of the early exercises is to overcome any initial discomfort with the technology. Trainees who are rushed may become confused, frustrated, and defensive. It is important to keep the training at a comfortable pace and to keep the technical jargon to a minimum.

After an introduction to the electronic mail function, trainees can be assigned a small case requiring three or more individuals' input. The case describes a simple problem, and each group member is given one piece of information necessary to solve the problem. The electronic mail system allows group members to share their piece of information with the other group members.

### **CASE 1: THE SALES MEETING**

**The Problem:** Several dates, time, locations, and topics have been discussed relative to the upcoming sales meeting. The problem is to find the correct date, time, location, and topic for the meeting. Each group member is given the correct information for one of the variables.

**Directions:** One member of the group is selected to start the communication. He/she sends a message to each member of the work group requesting information on the sales meeting. After each member responds, a message containing complete details on the sales meeting is shared.

After the problem has been solved, discuss reasons for using electronic mail, and stress the ease of communication. Undoubtedly some participants will note that they could have met in a group and solved the problem faster without the use of the computer. However, emphasize that for future problems, they can use the electronic mail to share information without the need for a face-to-face meeting.

If the system incorporates software that allows group members to view documents as changes are made, a second session will be useful. The new case is similar to the first in that each member of the group has one piece of information. The added feature is the need to create a

**Figure B: TRAINING OUTLINE**

#### **GDSS Training**

##### **I. Setting the Stage**

- A. Principles of Group Dynamics
- B. Introduction to Application Software
  - 1. Word Processing
  - 2. Spreadsheet
  - 3. Data Base
- C. Working in a Networked Environment

##### **II. Providing Groupware Training**

- A. Sharing Data through Electronic Mail
- B. Using Decision Support Tools
  - 1. Introduction to tools available
  - 2. Hands-on exercises using tools

##### **III. Incorporating Middleware Training**

- A. Explaining the Advantages of Integration
- B. Pulling Files from Multiple Platforms

joint document. Each student again provides the needed information but she/he can view the draft as revisions and additions are made by other group members. Since electronic mail does not greatly alter the group process, lengthy training sessions are not required.

Higher-level groupware products include decision support tools as well as electronic mail capabilities. If the trainees have a background in using decision support tools, the training can begin with how to access the desired tool from the network. Otherwise, it will be necessary to cover the purpose and use of whatever support tools are available. Prior to introducing the computerized version of the decision-support tools, use paper and pencil exercises.

Select an easy to understand support tool for the first exercise. A PERT chart would be appropriate. Start by explaining the purpose of the chart as an evaluation and review technique. Next, have the students developing a PERT chart for a simple project. (Activities of this type can be found in collegiate-level information systems planning textbooks.)

After the trainees understand the purpose of a PERT chart or whatever decision support tool was selected for the introductory lesson, they are ready to incorporate the support tool into a group exercise. The first exercise should contain a minimum number of variables and the group size limited to four students.

Allow the students to talk to one another during the first exercise but then advance the training to a simulation requiring all communication between group members to take place using electronic mail. Keep the focus on how the system provides support for a decision and eases the communication process.

A more complicated (realistic) situation can be incorporated into a later simulation/exercise. The number of exercises needed will depend on the experience of the trainees and the number of decision support tools to be introduced. A case per tool should be sufficient.

## CASE 2: CORPORATE PLANNING

**The Setting:** Group members are corporate executives in a planning session. A suggestion to expand the existing sales force has been brought forward. **Requirements:** Develop a database containing market data.

**Problem:** Determine the likely outcome of increasing the current sales force.

**People need to be convinced that the benefits of a GDSS make it worth the effort to learn the system.**

**Directions:** The group members are to use the financial model tool as a basis for their decision. (Once the user has selected a support tool, most GDSS will ask for information through a query approach.) Each member provides the necessary information based on her/his judgment of anticipated growth.

After the system averages the responses of each member, a financial evaluation is developed. Each member's input will be displayed. Group members discuss the reasons for their responses and come to a decision.

**Note:** The instructor may want to repeat the exercise having one group member enter very conservative figures (i.e.; expected growth). This will allow the group members to see how the system's response will vary depending on the input of members. It is important for group members to understand the resulting financial evaluation is an average of their responses.

### Incorporating middleware training

Middleware provides the protocol translation or interface to allow the sharing of files. The amount of training required will depend on the computer expertise of the students and on the middleware

package. Some packages provide a "seamless integration" but others are not

user friendly and require hours of training. The complexity of the GDSS technology is an issue that organizations need to examine when purchasing software.

At a minimum, provide a training session requiring group members to pull information from existing data bases. For training purposes, it may be easier to create "dummy" files. The purpose of the training is to illustrate the ability of the middleware product to integrate data from multiple networks. Without the interfacing capability of the software, users would need to recreate existing files. Middleware allows users to communicate through multiple operating systems platforms.

## CONCLUSIONS

Group decision support systems have the capability to improve the decision making process. They provide a means for communicating, access to decision support aids, and structure for the decision making process. Jim Lisiak, systems analyst at Chevron Information, notes that the downside of groupware is getting people who need it "to buy into it". (8) People need to be convinced that the benefits of a GDSS make it worth the effort to learn the system.

Another key to the acceptance of GDSS technology is top management support. Boeing Aerospace found workers were willing to learn and use groupware once they realized that top management and supervisors were going to use the system to share information. (2) Representatives from top management, therefore, should be included in the training sessions.

Organizations such as IBM, Xerox, Texaco Refining, NBC, and Frito-Lay have adopted GDSS. As these systems are introduced, training is needed for the full potential of the system to be realized. Although each GDSS differs, training will provide users with an important advantage—they will understand the potential of the system and they will be less resistant to using the technology.



## REFERENCES

1. Erickson, T. (1989). Interfaces for cooperative work: an eclectic look at CSCW'88. *SIGCHI Bulletin*, 21(1), 56-64.
2. Gillin, P. (1990, November 5). Group(ware) therapy: tips for success. *Computerworld*, pp. 109-111.
3. Opper, S. (1988, December). Making the right moves with groupware. *Personal Computing*, pp. 134-140.
4. Mockler, R. & Dologite, R. (1991). Using computer software to improve group decision-making. *Long Range Planning*, 24(4), 44-57.
5. DeSanctis, G. & Gallupe, B. (1987). A foundation for the study of group decision support systems. *Management Science*, 33, 589-609.
6. Nunamaker, J., Vogel, D., Heminger, A., Martz, B., Grohowski, R., & McGoff, C. (1989). Experiences at IBM with group support systems: a field study. *Decision Support Systems*, 5, 183-196.
7. Forman, J. (1987). Computer-mediated group writing in the workplace. *Computers and Composition*, 5(1), 20-30.
8. Janson, J. (1991, October 14). Groupware can pay for itself in productivity, *PC Week*, pp. 41, 510.

## AUTHOR'S BIOGRAPHY

*Dr. Heidi Perreault, who received her doctorate from Oklahoma State University, is an Associate Professor in the Administrative Office Systems Department at Southwest Missouri State University. She is the Executive Director for the Office Systems Research Association and serves on the Publication Committee of Delta Pi Epsilon.*

*Dr. Perreault teaches courses in business communication and office systems management. Her current research interests include groupware, multimedia, and voice messaging.*

# DPMA EDUCATION FOUNDATION INVITES COMMENTS

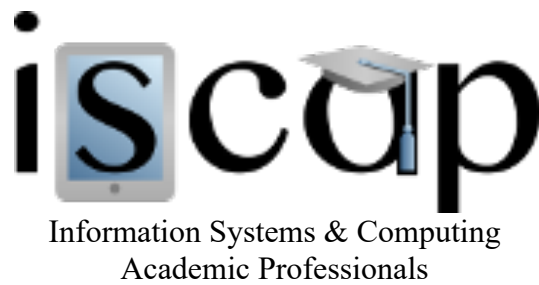
The DPMA Education Foundation (EF) is interested in receiving comments from educators, or business people, on the desirability of pursuing the development of a Common Body of Knowledge (CBK) for Management of Information Systems (MIS).

Various MIS curriculums (i.e., the DPMA 4-year CIS '90, etc.) have developed around CBKs. But, there has never been an all inclusive CBK for the field of MIS. The question being asked is: What would be the value of an all inclusive CBK for MIS; and, are there colleges, or businesses, that would support its development.

EF's purpose in sampling the opinion of JISE readers is to help guide discussions on the topic of the relevance of a defined comprehensive CBK for MIS.

Please send your comments (no later than April 15, 1993) to:

Mr. Bob Hoadley  
City of Raleigh, Data Processing Department  
222 West Hargett Street (27601-1341)  
P.O. Box 590  
Raleigh, NC 27602-0590



### **STATEMENT OF PEER REVIEW INTEGRITY**

All papers published in the Journal of Information Systems Education have undergone rigorous peer review. This includes an initial editor screening and double-blind refereeing by three or more expert referees.

Copyright ©1993 by the Information Systems & Computing Academic Professionals, Inc. (ISCAP). Permission to make digital or hard copies of all or part of this journal for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial use. All copies must bear this notice and full citation. Permission from the Editor is required to post to servers, redistribute to lists, or utilize in a for-profit or commercial use. Permission requests should be sent to the Editor-in-Chief, Journal of Information Systems Education, [editor@jise.org](mailto:editor@jise.org).

ISSN 1055-3096