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The Effects of Management Support on the Successful Implementation of Group Decision Support Systems

Thesis directed by Assistant Professor James C. Brancheau

During the Information Age, an increased need for group collaboration and group decision making has developed. Companies have concentrated on the processing and distribution of data, and the increased productivity of the individual user. Now more work is done in groups and companies are looking to meet the decision making needs of groups. Group Decision Support Systems (GDSS) are emerging as a solution for those needs. Most companies have no idea what GDSS is, and if they do, they do not have experience implementing GDSS type technology into their organizations.

One problem is that GDSS has many different definitions and different products within each definition. This has led to confusion over this new technology. To implement a GDSS, an organization must match its need with an appropriate technology and an effective implementation strategy. There are many different types of GDSS. This study looks at a

GDSS with Face-To-Face-Conferencing capabilities (or decision room).

This study identifies those management actions which organizations have found most useful for the successful implementation of a GDSS product. A model for the adoption and assimilation of new Information Technology and previous research in this area is discussed. GDSS terminology and previous research into the use of GDSS is discused. Finally, this research develops management actions necessary for the successful implementation of a GDSS.

A study to validate these management actions is described. This study presents and compares the experience of nine companies, along with the results of an individual survey completed by users of the GDSS. Study results are compared to the model and successful management actions are identified based on the research.

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by

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A thesis submitted to the
Faculty of the Graduate School of the
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DEDICATION

I would like to dedicate this thesis to my wife Renee for her continuous support and encouragement. I also would like to dedicate this work to my children who thought their father was always "at work" and did not get the attention they deserved.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation and gratitude to Jim Brancheau. The guidance I received in this research was very helpful and enlightening. I especially appreciate the insightful suggestions and the encouragement I received to make this thesis something I can be proud of when it is completed. Thanks to my committee members and other faculty whose comments, criticism, and wisdom helped me tremendously in my performance of this research.

CONTENTS

TABLES

Table

FIGURES

Figure

CHAPTER 1

INTRODUCTION

The power of Information Systems is rapidly expanding into non-traditional applications. Some of these applications are targeted at facilitating and increasing communication in the work-place. Many types of new technology are being developed to meet the needs of those applications. One such new technology is Group Decision Support Systems (GDSS).

"Group Decision Support Systems are computer-based systems concerned with group communications and how to improve it [Zigurs, Poole and DeSanctis, 1988, pp 625]." GDSS was conceived to help alleviate unproductive meetings and reduce the money wasted though the loss of employee time and poor or unclear decisions. The ability to organize and keep meetings on track is crucial for productive meetings. GDSS has supported organizations efforts in these areas.

Along with it, comes the need for their successful implementation into organizations. The ability of organizations to recognize key

interacting factors in the implementation of new technologies is vital to their gaining maximum benefits from these technologies.

> In the business world it is an all-too-familiar story where senior management pushes all the right strategic buttons at the top of the organization to initiate a required change, but at the bottom nothing happens. The result is usually frustration in the executive suite, disillusionment on the part of middle management, loss of confidence in the corporate leadership, wasted effort and resources, lost opportunities, staff casualties or even sometimes, organizational casualties. [Leathem, 1989, pp 39]

By not taking appropriate management actions organizations may repeat the mistakes of the past.

This thesis focuses on the management actions that affect the adoption of a new technology. It views GDSS as an emerging technology and identifies critical success factors that pioneering organizations have experienced in implementing GDSS.

Why Research is being Conducted

A recent study conducted at the University of Colorado indicates that most information system managers are not aware of the existence of GDSS [Hillringhaus, 1990]. Her survey of a random sample of information system managers in Fortune 1000 firms revealed 67% of respondents were unaware of the

existence of GDSS. The growth in the demand for information support for meetings has increased the need for GDSS. Because of its projected growth, understanding management actions critical to successful implementation are important information for those who have a vested interest in its success, e.g., Vendors, Sales Representatives, Managers, and Organizations.

> Managers and knowledge workers spend a significant proportion of their time working in groups. Estimates of this proportion range from 60-70% for information system (IS) managers to 30-80% for general managers. Unfortunately, most group meetings are not as productive as they could be. One Fortune 500 company estimated that it lost $71 million each year due to ineffectively managed meetings. [Dennis, 1988, pp 59,]

The need for GDSS is increasing and with that need companies must determine appropriate assimilation and adoption procedures.

The number and types of GDSS are quickly expanding. Confusion has accompanied this increase. Products labeled GDSS have a broad range including electronic mail, electronic blackboards, group writing software, teleconferencing centers, and decision rooms. This has caused uncertainty about what a GDSS is, how organizations can use GDSS, and

how organizations can successfully implement a GDSS into their work environment.

Because of the complexity of introducing new technologies into an organization, research is necessary to improve understanding of the key factors (People, Technology, Organization) involved in implementing new technologies. Such understanding will help improve the introduction of new technologies and provide for the realization of promised benefits.

Purpose of Thesis

The focus of this thesis is on understanding the management actions necessary to introduce GDSS technology. Research in innovation diffusion theory, technology assimilation theory and organizational learning theory taken in context with a model for the adoption and assimilation of new information technology is the basis of this thesis. Potentially effective management actions were examined through an interviews with managers who introduced GDSS technology into their organizations and surveys of employees who participated in the use of GDSS. This provided an initial understanding of management actions which might be important for

successful introduction of GDSS into an organization.

This research will assist managers who are preparing a plan for the introduction of GDSS into their organizations. It will provide tentative guidelines for understanding the changes introduced into an organization when implementing a GDSS. These changes often cause uncertainty about their jobs and the use of a new product. Included in these tentative guidelines are management actions to combat this uncertainty and help managers to deal with employee reactions to the introduction of new technologies. The goal is to assist managers in facilitating appropriate and productive organizational use of GDSS.

Organizations can use the results to determine the best way to analyze new technologies and develop the ability to anticipate employee reaction to the new technologies. Organizational guidelines can then be developed for planning implementation procedures.

Sales representatives and vendors can use the recommendations from this thesis to develop implementation plans and training sessions for their customers. This will increase the goodwill between

vendors and customers, resulting in the purchase of additional copies by satisfied customers. The successful use of their products will create references and fuel favorable reports through the informal channels of communication between companies.

The final contribution of this thesis is to provide a starting point for understanding the introduction of GDSS into organizations and provide further research into the adoption and assimilation of new information technology into organizations.

Organization of Thesis

The organization of this paper is as follows:

* Chapter 2 describes theoretical aspects of this research, covering the relationship between people, technology, and organization. Previous research in organizational change and management support is related to innovation diffusion theory. Management actions potentially related to successful introduction to GDSS technology are identified.

* Chapter 3 describes GDSS and provides definitions, terminology, and presents a description of OptionFinder (the particular GDSS used for

research). Previous research in the area of GDSS is discussed.

* Chapter 4 discusses the research conducted to identify successful management actions. This chapter describes the methodology for this research, including the design of the management interview guide and user survey. Finally the data collection process is discussed.

* Chapter 5 presents the results of the management interviews and user surveys.

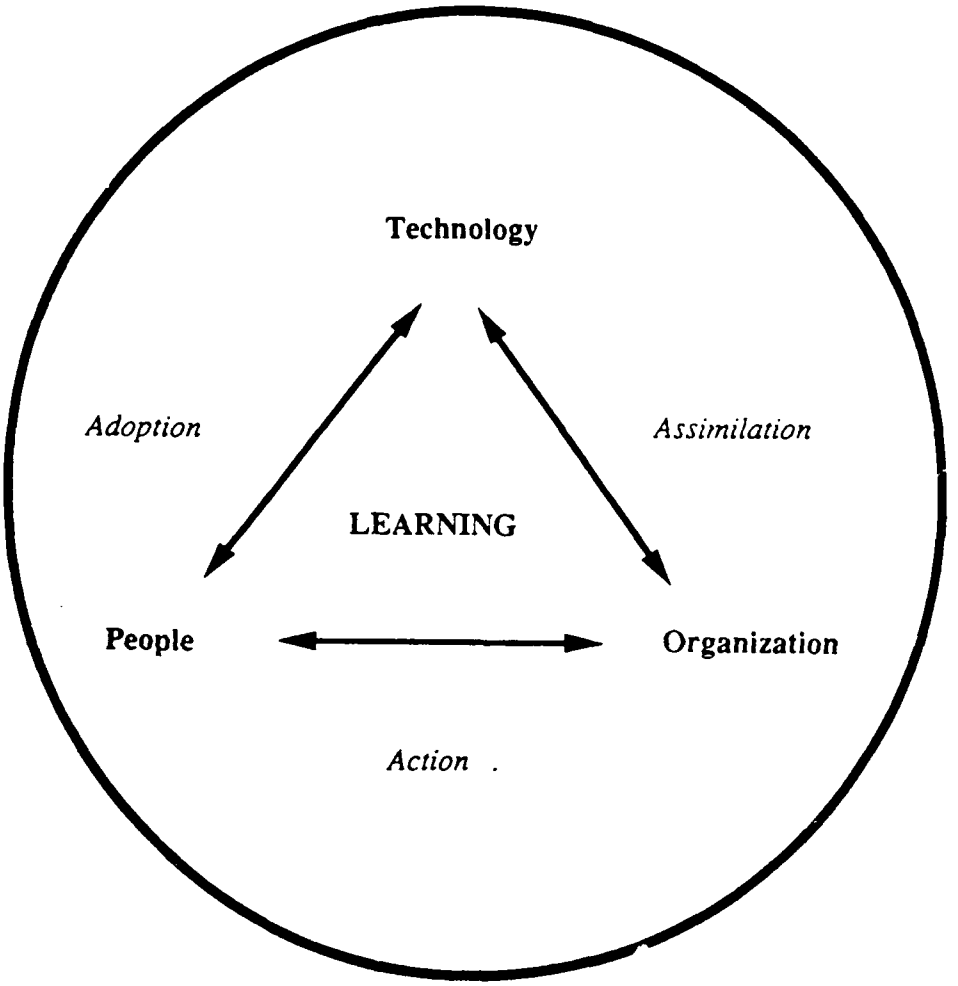
* Chapter 6 discusses and interprets the results of the research in terms of what was learned. Finally this chapter presents the limitations of the research and future directions for research in this area.

CHAPTER 2

ADOPTION AND ASSIMILATION OF NEW INFORMATION TECHNOLOGY

The organization's ability to implement successfully a new information technology depends in part on the planning process that must take place before the acquisition of a product. Organizations must be able to manage the implementation process for maximum employee acceptance. The most useful products are those used frequently for the correct tasks. Figure 1 [Brancheau 89] provides a model for understanding the adoption and assimilation of new information technology.

This chapter explores the interrelationship of three factors (People, Technology, and Organization) in the adoption and assimilation of new information technology. Assimilation is the process by which an organization acquires and implements technologies to meet business needs and/or requirements. Adoption is the decision process used by the people to learn and use the technology for the appropriate tasks. The action



Brancheau, 1989

Figure 1: A Social Learning Model for the Adoption and Assimilation of Information Technology

process is the ability of organizations to influence the people's decision to learn and use the new technology.

Assimilation Process

The Assimilation process involves an organizational view of the evaluation, purchase, and introduction of new technology into the organization. Part of the introduction phase includes the ability to define and redefine appropriate uses for the new technology. Organizations go through four phases of assimilation. They are 1) identification & initial investment, 2) experimentation & learning, 3) control, and 4) widespread technology transfer [McFarlan, McKenney, and Pyburn, 1983]. These stages relate very closely to Nolan's stages of growth [Gibson and Nolan, 1974].

Investment and experimentation concentrate on the effectiveness of the new technology, and therefore have fewer controls. While fewer controls are desirable at these stages, management must focus attention on the implementation of the new technology. Phase one involves matching business needs with the technology. Management must be able

to recognize problems during phase one, or the use of the new technology can stagnate [McFarlan, McKenney, and Pyburn, 1983].

> "Most companies in stagnation decided to "disinvest" in the system because it increased work and provided few benefits" [McKenney and McFarlan, 1982, pp 114].

Later, this chapter presents several models for identifying ways to match the business need to the technology.

The second phase involves the organization adapting the technology to their needs, including tasks not originally considered.

> If the second phase is managed so as to permit managers to develop and refine their new understanding of this technology, the organization moves to phase 3. Failure to learn from the first applications and to effectively disseminate this learning leads to stagnation [McKenney and McFarlan, 1982, pp 114].

Control and widespread technology transfer phases emphasize efficiency. Therefore some controls should be in place in order to get maximum utilization from the new technology. However, controls that inhibit the transfer and use of the new technology to other groups in the organization can lead to stagnation of the technology.

> Phase 3 typically involves a change in the organization, continued evolution of the uses of technology, and, most important, development of precise controls to guide the design and implementation of systems using these new

> technologies to ensure that later applications are made more cost efficient than the first [McKenney and McFarlan, 1982, pp 114].

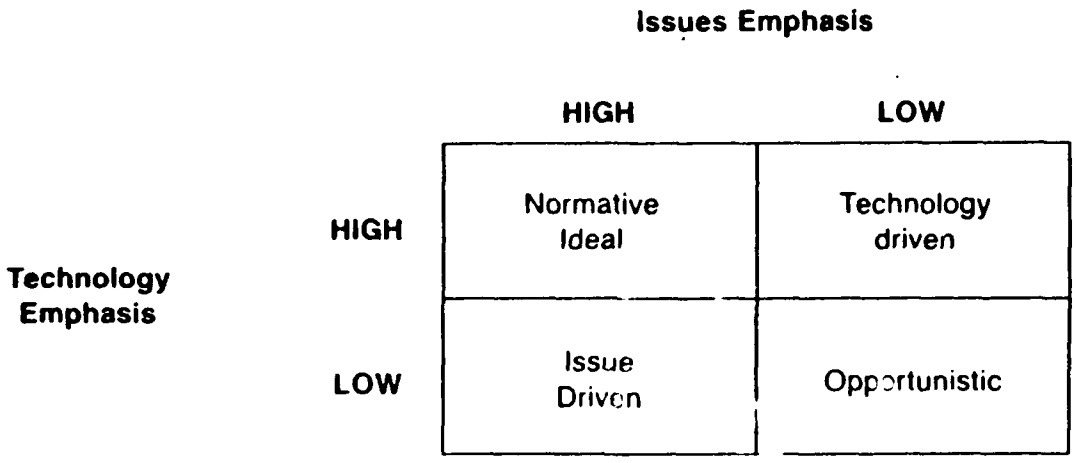
The primary concern of phases three and four is to spread effective technology use and implementation strategies to other parts of the organization.

One management style for all types of technology may not be appropriate. Different technologies will progress at different rates. New technologies will need to be in different phases of assimilation and managed accordingly.

Planning for future use of the new technology should be done in correspondence with each new phase of assimilation [Cash and McLeod, 85]. The new technology must be able to support business needs as well as employee needs.

As shown in Figure 2, four models for new technology adoption were developed based on research on how companies introduce new technologies into their organizations.

> We have found that the way in which an organization approaches each aspect - determining the issues and the applicable information technology - determines to a major extent in the way which the overall ITAA (information technology assessment and adoption) process happens in that organization [Huff and Munroe, 1985, pp 330].



Huff and Munroe, 1985

Figure 2: Four Models of the ITAA Process

The four models are 1) Issue Driven Model (Top-down Approach), 2) Technology Driven Model (Bottom-up Approach) 3) Opportunistic Model (Middle Out Model), and 4) Normative Ideal Model.

In the Issue Driven model, a thorough planning process looks at current organizational issues (prioritizing them), followed by a search of current technology to find solutions to the issues. The technology research conducted is not as thorough as the issue planning process. In some cases important technologies may be overlooked. The model is known as a top down approach because of the prioritization of resources. Management usually appoints a study team to research appropriate technologies. The study team performs analysis on available technologies and identifies possible solutions for the issues. Distinguishing characteristics include heavy expenditures during the planning phase, efficient well focused search for solutions, little need for high level sponsorship, and organizational slack and flexibility not required because of well structured approach.

The Technology Driven model involves the identification of new technologies and fitting them

to problems in the organization. This provides for a thorough review of the available technology, but companies may overlook important organizational issues. The model is known as a bottom-up approach because the technology is identified first (usually in the lower levels of the organization) and then fitted to organizational issues. These organizations generally have individuals who are well versed in new and experimental technologies. These individuals have more interest in technical conferences and maintain larger and more up-to-date libraries. Characteristics of this model include large amount of organizational slack and flexibility, the ability of the employees to gain high level sponsorship for the new technology, less costly due to lower cost on planning, and the ability to develop ideas for technology uses rather than organizational issues.

The Opportunistic model focuses on neither issues nor technology planning.

> Such firms may be pictured as a "sea" of partially developed issues and partially investigated technology options, with neither playing a leading role. Occasionally a matchup between issue and technology occurs [Huff and Munroe, 1985, pp 332].

This model involves more of a learn-as-we-go approach. Firms feel their way through the process a step at a time without using an organized process. The model is known as the middle-out approach due to the matching between issue and technology, then working out the details for each. Characteristics of this model include no need for flexibility and slack, no large expenditures for planning or technological information search, generalist skills are more desirable, the ability to recognize important issues, and matching issues to technology. In all probability most organizations fall into this category.

The Normative Idea model involves comprehensive planning for both issues and technology. Management matches the issues and technology to determine the ability of the technology to meet the information needs raised by the issues. This assessment is used to develop a long range plan for information needs. Characteristics of this model include comprehensive development of both issues and technology, very costly due to planning time involved, low need for sponsorship since the technology was developed by the organization. In the research conducted by Huff

and Munroe (1985), they found no companies using this model.

Organizations need to look at what phase of growth is needed, how well the technology matches the need, and the development of an adoption model that suits the organization. The company should do this process periodically to insure the new technology is accomplishing the goals they purchased it for.

With the goals set, organizations must prepare for changes in the intended uses and goals. The ability of organizations to learn from changes introduced from the use of the new technology is crucial to the technology's assimilation into the organization [Cash and McLeod, 1985]. Cash and McLeod suggest that the organization should simultaneously allow the new technology to improve current practices and lead them into new functions. Organizations need to learn and adjust at all stages of assimilation.

Organizational learning involves more than just the employees learning within the organization. Employees must act as learning agents within the organization. They respond to the changes brought on by the new technology by detecting and correcting

errors in use, then passing on positive aspects of the new technology's use. There are two types of learning involved, 1) Single-loop learning, and 2) Double-loop learning.

> Single-loop learning is like a thermostat that learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it can receive information (the temperature of the room) and take corrective action. Double-loop learning occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies, and objectives [Argyris and Schon, 1978, pp 3].

Hence double-loop learning requires questioning of the original decision made and the norms, policies, and objectives of the organization.

The ability of the organization to learn is often inhibited by accepted employee behavior. In order to introduce change into the organization, employees must be able to question what is being done and develop solutions to errors that exist. This requires the unfreezing of undesirable behavior and refreezing of the desirable behaviors.

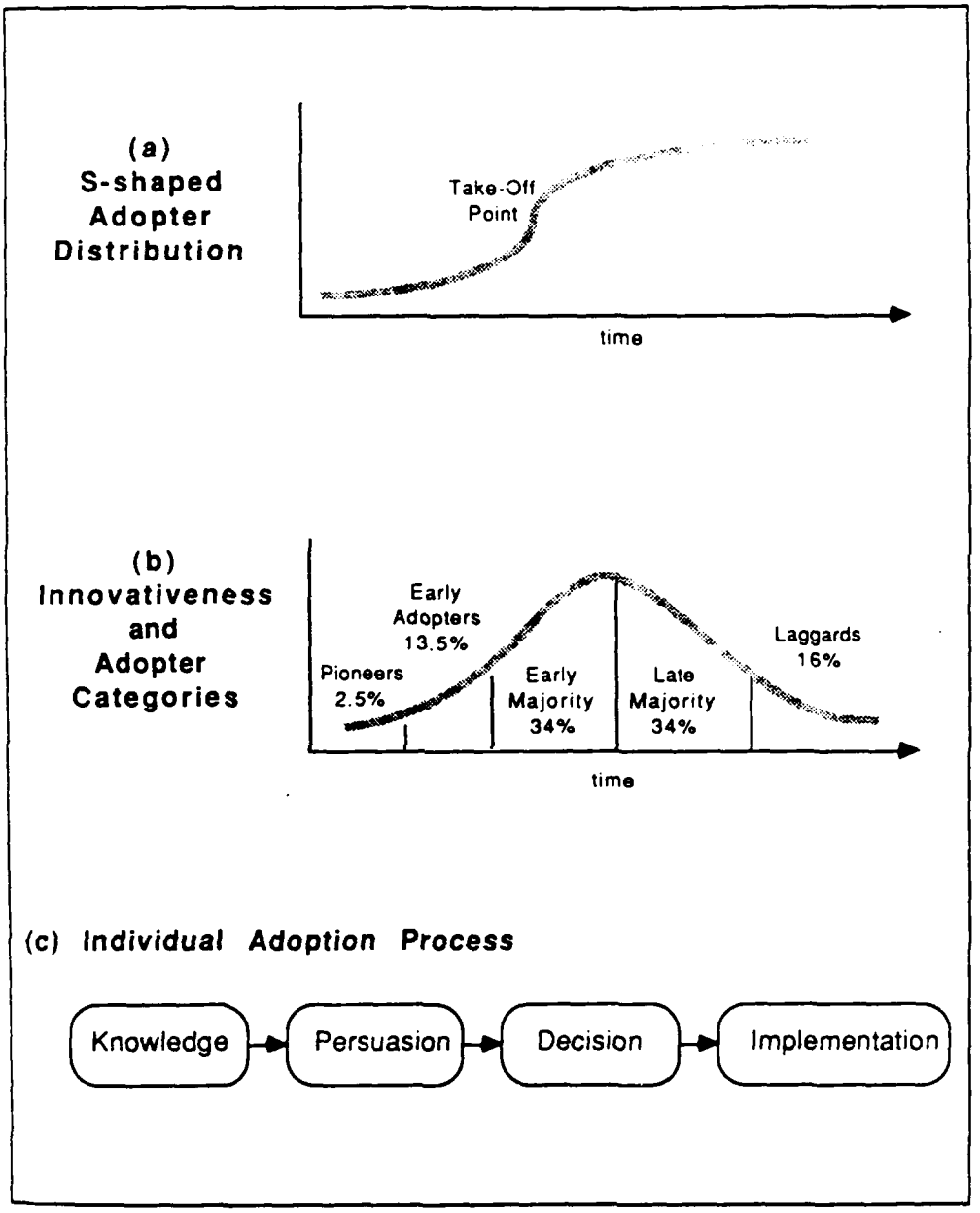
Companies can apply this same action to the use of new technology. While implemented for a particular task, they should encourage employees to find alternative uses for information technologies. This may mean the original use (in some cases) was inappropriate or they must modify the use of the

technology to fit the task. Not all technologies will fit into every organization, in some cases the correct alternative is discontinuance. The goal is to enable the organization to learn from the use of the technology and ensure the assimilation of the technology in appropriate parts of the organization for maximum effectiveness.

Adoption Process

New technology, management, fellow employees, change agents, communication channels, and champions within the organization affect the ability of the employees to learn new tasks. These factors play different roles in the adoption process and result in different rates of adoption. A common name for this process of individual adoption is "Diffusion of Innovations" [Rogers, 1983].

Adopters can be placed in categories based on their rate of adoption. The five categories are innovators, early adopters, early majority, late majority, and laggards. The adoption rate occurs in a bell shaped curve (Figure 3). The early and late majority make up 68% of the adopters and are the central portion of the curve. The total adoption rate for the innovation depicts a S-shaped curve,



Brancheau, 1989

Figure 3: Major Components of Innovation Diffusion Theory

based on the cumulative number of adopters. There are several distinguishing characteristics for each category [Rogers, 1983].

Innovators are more venturesome and are willing to risk occasional setbacks. They require high technological skills to assess possible innovations and deal with high levels of uncertainty about the innovation. They communicate with other innovators frequently, comparing experiences with different technologies. They are generally the gatekeepers for new technology into the organization.

Early adopters are usually the opinion leaders in the organization. They are respected by their peers and have the ability to weed out poor innovations. Other employees look to them when making the adoption decision. They act as a filter for innovations and decrease the uncertainty of adopting the innovation.

The early majority follow closely behind the early adopters. They are less often opinion leaders and are more cautious in their adoption decision. They are eager to adopt and they provide for widespread use of the new technology.

The late majority are skeptical of new technology and will only adopt when a majority have already done so. Peer pressure plays a major role in their adoption decision. They will not adcpt until all uncertainty about the technology is removed.

The laggards are last to adopt. They tend to rely on past experience and interact with others in this category. They tend to be suspicious of innovations and may not adopt until the innovators are already making the innovation obsolete (through a new technology).

While these are convenient categories for a generalization, it should be noted that the lines between categories are blurred. If an innovation proceeds through an organization quickly, most adopters could be in the majority when compared to other organizations.

Potential adopters go through an individual adoption decision process. This process involves choosing between new and old ideas, primarily through the reduction of uncertainty of the new idea.

> The *innovation-decision process* is the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to forming an attitude toward the

> innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision [Rogers, 1983].

This innovation-decision process consists of five stages; 1) Knowledge, 2) Persuasion, 3) Decision, 4) Implementation, and 5) Confirmation. Some researchers combine stages four and five into one stage.

The knowledge stage involves exposure to the innovation and some functions performed by the innovation. This is the initial matchup (by the employee) between needs and technology.

The persuasion stage involves forming a negative or positive attitude about the innovation. This involves the individual seeking out and learning more information about the innovation. Important factors involve who the individual seeks for advise, what types of advice they receive, and how they interpret this advice. At this stage the individual seeks out information on advantages and disadvantages of the adoption. The employee's goal is to reduce the uncertainty with the technology.

The decision stage involves the decision to use (Adoption) or not to use (Rejection) the innovation. Often the individual will give the innovation a trial use to further reduce uncertainty about adopting. If the innovation is not trialable,

then information received during the persuasion stage will have the greatest influence.

The implementation stage involves putting the innovation to use. Individuals are still uncertain about using the innovation at this point. A bad experience at this time may lead to rejection of the innovation. At this stage different uses for the innovation (Re-invention) can be found. Re-invention can lead to a more appropriate match between needs of the organization and functions of the innovation. Re-invention is critical in order for organizational learning to take place.

The confirmation stage involves the individual seeking reinforcement for their decision to use. At this stage they may still reject the innovation (Discontinuance) if evidence points to poor consequences for continued use. Discontinuance can take place in two forms, replacement and disenchantment of the innovation. Replacement occurs when an innovation takes the place of the previously adopted innovation. Disenchantment involves rejection because of the performance of the innovation. This may occur as result of misuse, often due to the lack of knowledge about the innovation or because the innovation (when properly

used) did not perform as billed. The confirmation stage leads to full use of an innovation.

Communication channels (Diffusion networks) play an important role during the innovation-decision process. Two major communication channels are mass media and interpersonal. Mass media channels reach a large audience, provide for widespread exposure for the innovation, but do not give individuals a strong opinion about an innovation.

Interpersonal channels lead to a two way exchange and can lead to a strongly held opinion about an innovation. These channels can be inside or outside the normal organizational communication network. Innovators and early adopters rely more heavily on the outside channels of communication, while later adopters require interpersonal communications during there innovation-decision process. In either case the interpersonal communication channel plays a very important role in the adoption process.

Change agents provide organizations with a mechanism for the adoption of innovations. They are responsible for implementing change within the organization. Change agents generally have

expertise in the type of innovation being introduced. They must select the pertinent information from the large volume available in order to give the user information that is most pertinent. The change agent can have seven roles when introducing an innovation [Rogers, 1983].

1) *Develops need for change.* The change agent informs the user of a needed change in behavior. Pointing out existing problems and assessing the clients' needs to help confront these problems.

2) *Establishes an information-exchange relationship.* The change agent then should develop a trusting relationship with the user. The user's acceptance of the information provided by the change agent is often judged on the perception of the change agent.

3) *Diagnoses their problems.* The change agent must analyze the problem, by seeing the situation through the user's eyes, in order to recommend existing alternatives.

4) *Creates intent to change in the client.* Change agents must motivate the user to seek a change from the possible solutions presented, but it

must be a user centered change. Focus must be on the user's needs.

5) *Translates intent into action.* Change agents can work with opinion leaders to influence the decision process.

6) *Stabilizes adoption and prevents discontinuances.* Positive reinforcement is needed at this stage, if the user's decision is to reach the confirmation stage of adoption.

7) *Achieves a terminal relationship.* The change agent must change the user into their own change agent. The user must become self-reliant and correct undesirable behavior.

Opinion leaders have informal influence over others in the organization. They are not appointed, but have gained fellow employees' respect based on experience. They can be opinion leaders in business or technology issues. Opinion leaders have greater communication channel access and social participation. Change agents generally seek them out to help the diffusion process.

> Opinion leaders are key people in the organization for facilitating or impeding diffusion. They exist formally (by position) and informally (by social status) at each level in the organization. They can help bridge the communication gap between technical and business people [Brancheau and Wetherbe, 1989, pp 25].

The difference between opinion leaders and innovators is very significant. In some cases they may be the same person, but generally opinion leaders are early adopters. An opinion leader has a following among fellow employees, while innovators may not. Opinion leaders communicate with all types of people more frequently than any other adopter category.

The innovation itself has important characteristics associated with it that affect the diffusion process. They are relative advantage, compatibility, complexity, trialability, and observability. Relative advantage is the extent that the innovation is perceived to be better than what it is replacing. The greater the relative advantage the greater the rate of adoption.

The compatibility of the innovation (with respect to the adoptee's values, experience, and need for adoption) will decrease the uncertainty involved in the innovation-decision process and increase the likelihood of adoption. The complexity of an innovation has an inverse relationship with adoption. The more complex the less likely the innovation would be adopted.

Trialability has the same type of relationship as compatibility. Innovations that can be tried on a limited basis have less uncertainty associated with them and are more likely to be adopted. The ability to gain immediate feedback is important in the adoption process. Observability is the degree to which the results can be demonstrated and conveyed to others. Those difficult to observe have increased uncertainty associated with them.

Action Process

The ability of the organization to affect the adoption rate (and thus assimilation) is the action process. The action process encompasses stages of growth for an organization, the handling of the innovation, the implementation process for new systems, and training and support provided for new and existing systems.

The four stages of growth are Initiation, Expansion, Control, and Maturity [Gibson and Nolan, 1974]. During the initiation stage, management deals with the introduction of the new computer resources. The functional area which intends to use the new technology usually gains responsibility for it, with the intent of placing it in the information

system department when the technology proves itself viable. Sometimes the functional area grows attached to the control of the new technology and does not want to give it up. Management must also deal with the employees' fears of possible replacement by the new system. Management must work to decrease fears and uncertainty that arise with the introduction of new technology.

During the expansion stage management encourages widespread use, they place little emphasis on cost and usage controls. The users reinforce each other's need to use the new technology, and the support staff is only to happy to meet the users increasing demand for more. Management must insure budget overruns don't occur that would kill the project at this time.

During the control stage usage controls are put in place, many times as the result of cost overruns. The focus is on the control and exchange of user experiences on the new system. Management, in some cases, will crack down too hard replacing much of the support staff and severely limiting usage. There are three control steps that can smooth management through this stage. First, centralize the less complex and established

technologies. Second, management must provide guidelines for the use of technology within the established organizational goals. Third, provide system analysts throughout the functional areas to ensure user needs and technology are properly matched.

With the Maturity stage comes the realization of full use. At this point management must prepare to meet the continuing changing user needs. Management must walk a fine line between taking over user applications and providing the support that is needed.

There may be many different technologies in different stages of growth within the organization. Management must manage each technology appropriately to provide for maximum adoption.

> Organizations are usually quick to announce the dollar values and benefits expected from the introduction of major changes, yet it is rare that those benefits and earnings are fully achieved. This is because the impact on the individual employees, the targets who must modify their work performance for the new changes to be successful, is often underestimated [Leathem, 1989, pp 4]

There are many steps management can take to help alleviate the stress and uncertainty placed on the employees during this change.

The two basic ways to introduce change are the hammer approach and the sales approach [Leathem, 1989]. The hammer approach involves full implementation and informing the employees they will use the new technology. The sales approach involves gaining support for the new technology before full implementation. While the hammer approach causes greater anxiety, several management actions can reduce the uncertainty involved. The availability of management support, support services (both formal and informal), training (pre- and post-implementation), and an understanding of the target user (their skills, needs, and attitudes) positively affect the adoption process.

Management support plays different roles for adopter groups [Leonard-Barton and Deschamps, 1988]. Management support comes in two forms. First, the initial message to use the new technology. Second, the positive reinforcement for the use of the technology.

Innovators and early adopters rarely notice the management's initial message to use the technology. The knowledge of the technology is enough (through mass media channels) for most to proceed to experimental use. Important factors for

their initial use are the availability of the technology and positive reinforcement for continued use. Those not receiving positive reinforcement may be more inclined to discontinue use. While those adopting later, will not usually adopt until the initial message to adopt occurs.

This chapter presented a review of the literature within an adoption and assimilation model that helps explain the general processes that take place with the introduction of new technology. The importance of all three factors (People, Technology, and Organization) must be taken into account when planning the introduction of a new technology. Figure 4 presents a summary of the assimilation, adoption, and action processes discussed in this chapter.

Organizations planning the introduction of new technology should anticipate the changes that will take place. The technology will assimilate into the organization, employees will adopt the technology, and management will take actions to introduce the new technology.

Companies should plan for the stages of assimilation and determine the optimum model for matching the technology to the need. Then they must

ASSIMILATION

Four Stages of Assimilation
- Identification & initial investment
- Experimentation & learning
- Control
- Widespread technology transfer

Four Models of Technology Assessment
- Issue Driven
- Technology Driven
- Opportunistic
- Normative Ideal

Organizational Learning
- Single-loop
- Double-loop

ADOPTION

Adopter Categories
- Innovators
- Early adopters
- Early majority
- Late Majority
- Laggards

Adoption Decision Stages
- Knowledge
- Persuasion
- Decision
- Confirmation
- Implementation

Communication Channels

Change Agents

Opinion Leaders

Innovation Characteristics
- Relative advantage
- Compatibility
- Complexity
- Trialability
- Observabiltiy

ACTION

Four Stages of Growth
- Initiation
- Expansion
- Control
- Maturity

Introduction Style
- Hammer
- Sales

Management Support

Figure 4: Overview of Assimilation, Adoption, and Action Processes

assist the learning process of the organization and provide assistance for the employees seeking to adopt.

By looking at the adopter categories and innovation decision stages they can develop actions to help the employees learn the new technology. This process is made easier with the assistance of communication channels, change agents, and opinion leaders. They must also understand the characteristics of the new technology and take appropriate actions.

This knowledge can then be used to plan for growth within the organization and management support needed to accelerate learning. With proper planning, management can remove much of the uncertainty for all parties involved and organizations can begin to reap the benefits of effective technology assimilation. Companies who understand the process of adopting a new technology stand a better chance of success than their competitors.

CHAPTER 3

GDSS as a New Technology

GDSS has come about due to the changing nature of the work environment.

> The growth of interfunctional teams and often cross-organizational teams is leading to further initiatives in the establishment of "groups" and cooperative clusters of both short and long term duration. Integration within and across the organizational boundaries is further stimulating interest in leveraging information technologies to enable and support work of groups and teams [Benbasat and Konsynski, 1988, pp 588].

With these changes in the work environment, the decisions that are made have grown in complexity and number of people involved. This has increased the necessity of conducting productive group meetings and increasing communication for participants in those meetings.

> A GDSS aims to improve the process of group decision making by removing common communication barriers, providing techniques for structuring decision analysis, and systematically directing the pattern, timing, or content of the decision [DeSanctis and Gallupe, 1987, pp 589].

With the help of GDSS groups can increase communication, provide for participation of all members, and focus the conversation on key issues of

the meeting. This is done by matching the technology to the need.

Definition and Terminology

The are many different types of technologies called GDSS. Other labels for these types of technology include groupware, group process support services, computer-assisted communication, coordination technology, computer conferencing, and collaborative support services.

The types of technologies that have been called GDSS (by those wanting an all-encompassing definition) include E-mail, electronic blackboards, microcomputer workstations, voice messaging systems, distributed computer networks, teleconference centers, and videoconference systems.

With the wide range of labels used and types of technology offered, many people are confused as to what is actually available and how to use it.

> A GDSS is broadly defined as any technology which is used to enhance group decision-making in an organization. Like an individual DSS, GDSS is designed to provide tools and support for decision-making. Unlike DSS, however, GDSS also provides for decisions which must be made by more than one person [Straub and Beauclair, 1987, pp 1].

With a broad definition of GDSS any tool used by groups can be called a GDSS.

Several researchers developed different categories of GDSS technology. These categories are based on meetings types. Figure 5 represents the definition of GDSS categories used by this study [Straub and Beauclair, 1987].

GDSS Name	Alias and DeSanctis & Gallupe type	Prominent Features
Interfaced Conference	Computer conference (Types 2 & 4)	Non face-to-face conferencing via the computer at remote and/or local sites; e.g., electronic mail used for group decisions
Face-to face Conference	Decision Room (Type 1)	Conference room with terminals or nodes for participants in group decision
Face-to-face Teleconference	Tele-conference (Type 3)	Conference rooms at remote sites with video and telecommunication links; extended decision room

Figure 5. Aliases and Prominent Features of GDSS Types

This definition is similar to the categories developed by DeSanctis and Gallupe (Figure 5 references these categories), which were based on group size (smaller and larger) and member proximity (face-to-face and dispersed) [DeSanctis and Gallupe, 1987]. Straub and Beauclair combined types 2 and 4 into one category.

Type 1 is a *Decision Room*, consisting of a face-to-face meeting with smaller groups. In this type of meeting group members usually have a specific problem to address, with a set time limit. The room has a common display screen with input devices available to the participants. The group uses the screen to display ideas, votes, and analysis of group preferences.

Type 2 is a *Legislative Session*, consisting of a face-to-face meeting with a larger group. This is similar to a decision room. More participants require a larger meeting room and group members may be required to share input devices.

Type 3 is a *Local Area Decision Network*, consisting of a dispersed meeting with a smaller group. This type of meeting has group members who are usually physically dispersed and use electronic communications. The group uses networks to link them together and meetings may last a couple of days. Group members do not have to be on line at the same time.

Type 4 is a *Computer-Mediated Conference* consisting of a dispersed meeting with a larger group. This type of meeting has group members physically dispersed who need to participate in a

decision making session. This type of meeting is not very common, but may increase with continued improvements in telecommunication networks.

Another classification for GDSS is through the level of support the GDSS provides [DeSanctis and Gallupe, 1987]. A level one system provides for removing communication barriers and improves the decision process by facilitating the information exchange among members. Common technical features are large screens, vote solicitation, anonymous input, and message exchange between members.

A level two system provides for removal of communication barriers, decision modeling, and reduced uncertainty. Common technical features are tools for support analysis, risk analysis, or multiattribute utility methods. A level two system may include group structuring methods that are hard to apply manually.

A level three system includes the addition of intelligent support. This introduces machined induced communication patterns and expert advice in selecting and arranging rules. The system could make changes in communication channels, depending on factors occurring in the discussion, and control the interpersonal exchange of information.

With the emergence of needed uses for GDSS, companies will develop commercial products to meet the needs of all types of meetings. Most available commercial products are based on the needs of the decision room type of GDSS. This study focuses on the decision room as a GDSS, and looks at pioneering firms' experiences with a GDSS product called OptionFinder.

OptionFinder

This study focuses on the GDSS category of Face-To-Face-Conferencing. OptionFinder was chosen as a representative product from this category. It is produced and marketed by Option Technologies Inc. It was first commercially available in 1986. OptionFinder is a type of decision room providing level one type of support for meetings, but does not provide for message exchange between members. OptionFinder is one specific example of GDSS technology.

OptionFinder was designed to help improve meeting management effectiveness. Its goal is to improve meeting results and reduce meeting time.

OptionFinder is a vote collection and analysis tool. It can connect up to 120

participants using a lap-top computer. Participants use a ten button keypad to input their votes. The system connects to a large screen or overhead display so all participants can view the results of a vote. A facilitator runs the meeting through OptionFinder. Figure 6 shows the typical meeting process using OptionFinder.

Features of OptionFinder are: adds structure to the meeting by separating brainstorming from consensus building; reduces communication barriers so the quiet ones talk more and the expressive ones less; focuses attention of the participants on the key ideas under discussion during the meeting; draws out critical information, clarifying the issues under discussion; produces a clarity of outcome; and minimizes the rehash of old discussion, allowing participants to move on to new topics.

The facilitator can have the participants vote on as many as fifty-two items. These items can be generated through a brainstorming session (using OptionFinder) during the meeting or entered into OptionFinder before the start of the meeting. Votes are taken through either a forced-choice paired comparison or one of three different types of scales (Likert, discrete, or nominal). The facilitator can

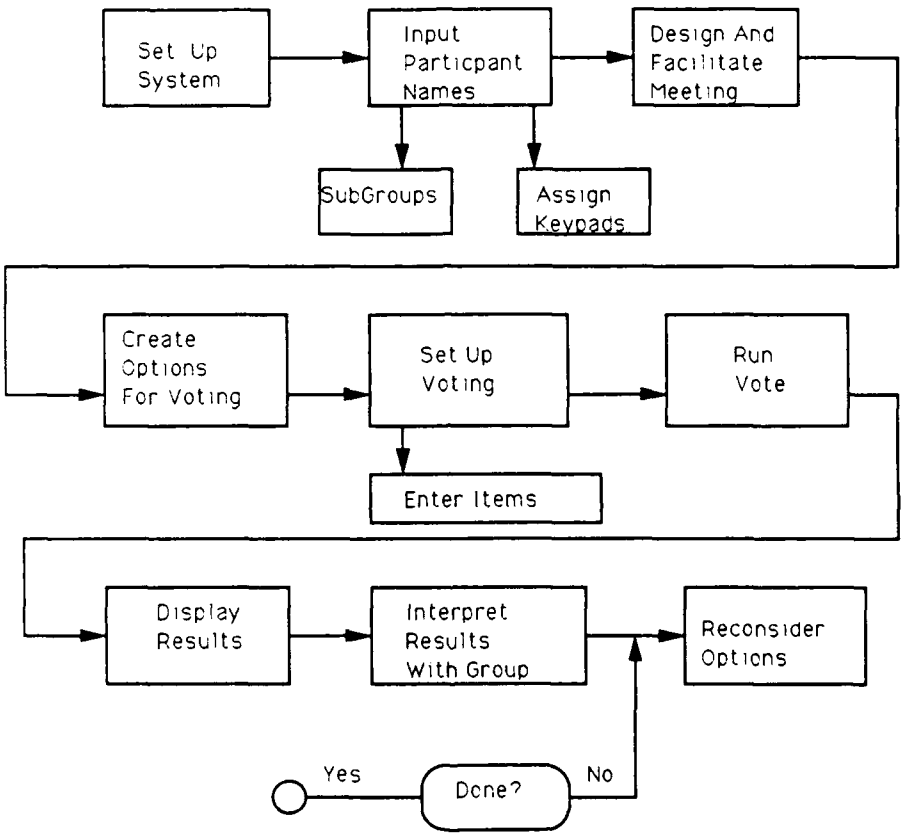


Figure 5: OptionFinder Meeting Process

divide the participants into subgroups and monitor the vote of the subgroups.

The meeting facilitator can display the results of a vote as the average of the votes of the whole group on all voting items, an anonymous scatter of the individual votes on each voting item, or a comparison of different subgroups represented by the meeting participants on each voting item. The group then discusses the results of the votes and the facilitator can generate new voting items.

The results of the meeting can be saved and copies distributed to all participants. The participants can then perform further analysis of the results and this provides all participants with a record of actions taken as a result of the meeting. Suggested meeting uses include assessing future events, meeting customer needs, job evaluation process, and conducting focus group research.

Existing Research

Most existing research revolves around the actual use of GDSS. The focus is on how GDSS improves meetings and interaction of group members.

This chapter reviews research examining the current use and impacts of GDSS on meetings.

One recent study examined organizational uses of GDSS, how GDSS has met the needs of organizations, and how each organization uses GDSS [Straub and Beauclair, 1987]. This study involved a random survey of 2000 DPMA (Data Processing Management Association) members, members at what companies currently use the three categories of GDSS defined in the preceding section and those companies planning to implement such systems. The study found three out of ten respondents using or planning to use one of three categories of GDSS. The studies response rate was very low, with only 135 organizations responding (response rate of seven percent). Only forty-five of the two thousand companies (2.25% of companies surveyed) reported using GDSS technology.

Respondents cited using Interfaced Conferencing most frequently (19%), followed by Decision Rooms (10%) and then Teleconferencing (4%). Twenty-one percent of the respondents used more than one type of GDSS, with no respondents using all three types.

For companies using Interfaced Conferencing the most popular uses (as a percentage of use) were for aggregation of data (65%) and statistical support (44%). Most popular uses reported for Decision Rooms were Strategic Planning (86%), Brainstorming (57%), and Forecasting (43%). Most popular uses cited for Teleconferencing were strategic planning (80%), Brainstorming (60%), and Teambuilding (60%).

Eleven percent of the respondents reported they will implement a system within the next four years. Eight percent of the non-user respondents reported plans to implement a Decision Room and seven percent an Interfaced Conference system in the next four years.

The study showed most organizations had no plans to introduce an Teleconferencing system, primarily due to the cost of these systems.

As a rule, research in GDSS focuses on studies involving decision rooms (category 2) versus no computer support. These studies are on groups of four or less and involved problem solving tasks. Table 1 presents a summary of the studies done to date [Dennis et al., 1988].

GDSS receives mixed reviews from the studies. Research has found decision quality to be evenly split between improved and no effect. One study shows GDSS has no effect on consensus, while

Table 1. Experimental GDSS Research: Decision Rooms

GDSS DECISION ROOMS VS. NO COMPUTER SUPPORT						
Studies	Decision Quality	Consensus	Time to Decision	Participation	Satisfaction w/Process	w/Outcome
Steeb and Johnston, 1981	GDSS better		GDSS takes longer	no report	increased w/GDSS	increased w/GDSS
Lewis, 1982	GDSS better			GDSS reduces individual dominance	no effect	
Ruble, 1984	no effect					
Gallupe et al.,	GDSS better		GDSS takes longer	no effect	reduced by GDSS	reduced by GDSS
Beauclair, effect 1987	no effect		no effect	no effect		no
Watson, et al., 1988	GDSS worse than manual better than nothing	no effect			reduced by GDSS	
Zigurs, 1987	GDSS better			more even distribution of influence		
A.Easton, 1988	no effect		no effect	no effect	no effect	GDSS more satisfied
G.Easton, 1988	no effect	less likely in GDSS	faster in FTF	more equal in GDSS	no effect	
Jarvenpaa, et al., 1988	EBB first, workstation 2nd and conv. last			no effect	no effect	

another shows consensus is less likely with GDSS. Two studies show decision time is longer using GDSS. The studies were evenly split cn participation, with three stating no effect and three stating more even distribution. The studies were diverse on satisfaction, half showing GDSS had no effect and the rest split between better and worse.
In A. Easton's (1988) study, structured approaches (computer support or none) led to better quality decisions, had equally distributed participation, took longer, and had higher user satisfaction with outcomes and processes. In Jarvenpaa's (1988) study EBB stands for electronic blackboard, workstation is a GDSS with networked workstations, and conv. stands for no computer support.

A study comparing four recent GDSS experiments found the design of most systems and research design are very different [George, 1988]. While all studies dealt with the GDSS category of decision rooms, studies were different in the software support provided by the decision room and how the researches designed the experiments.

The study suggests that GDSS is a general class of software support tools. Trying to draw conclusions from the comparison of experiences from

different studies and systems may not be useful. Researchers in GDSS need to identify the similarities of their research (and GDSS capabilities) to research already accomplished.

"Group Support Systems in Practice; Experience at IBM" is a study assessing the uses of a group support system in an operational setting [Nunamaker et al., 1989]. This study differed from most studies in that it was accomplished in an operational setting. The study looked at user acceptance, reaction to the group support system, and outcome of the process (in terms of user effectiveness, efficiency, and satisfaction).

For effectiveness, the study looked at quality of session and quality of outcome. The researchers looked at user log files (for evenness of participation) and surveyed the users on how they felt about the system. They compared the participation with traditional group dynamics and found equal participation among users. The follow up surveys found users (management and non-management) felt the system helped effectiveness.

For efficiency of the system, the researchers compared man-hours spent with projected man-hours spent. Managers predicted the projected

man-hours based on previous experience with similar projects. They found an average man-hour savings of sixty-one percent at a manufacturing site and an average man-hour savings of fifty-five percent at an administrative site. They also asked the users (during post-session questionnaires) about system efficiency. Seventy-two percent of the participants thought the system was efficient.

For user satisfaction with the system, the researchers used utilization rates, post-session questionnaires, and user interviews. The system has a three week waiting period for meetings, and the company plans on installing more systems in other company sites. A problem reported by the users is the inability to get the system when they want. This was deemed a measure of satisfaction. The user surveys showed a seventy-eight percent rate of user satisfaction. The user interviews also showed strong user satisfaction.

This study differed from most studies in that the results of use were all positive. A limitation was the inability to compare results with pre-implementation data. Estimates given were all based on experience, making conclusions somewhat uncertain.

A study [Watson et al., 1989] examining organizational support provided by organizations for Decision Support Systems has implications for GDSS support (due to the similarities).

> One aspect of the late stages of technology assimilation is the institution of formal structures and procedures for managing technology. Providing support for the use of this technology is an important part of this evolution [Watson et al., 1989, pp 101].

Questionnaires were mailed to 300 companies, with fifty five responding.

The study found twenty-nine companies offering both formal and informal support. Only five companies offer no support (formal or informal). On average, companies offering formal support offered DSS support a year earlier than companies not offering formal support. Companies offering both types of support offered DSS support one and a half years earlier than companies not offering both types of support.

The most frequently reported support services were: providing hardware, software and data; prompting the use of DSS; providing DSS consulting services; and providing technical support. The most frequently requested services were: planning, organizing, staffing, directing, and

controlling DSS activities; building DSS for users; and operating DSS for decision makers.

Most respondents reported DSS support provided was moderately or highly effective. The finance department is the heaviest user of DSS support followed by the marketing department. The engineering department requests the least amount of support for DSS.

The study makes the following generalizations of DSS support provided: DSS is primarily an end-user computing activity, DSS support began in the late seventies and spread in the eighties, DSS support units tend to be small and well educated with considerable work experience, and DSS support is offered in many locations.

GDSS appears to be ten years behind DSS in technology assimilation. The appearance of formal support for GDSS may be an important step in its assimilation.

Most research to date finds mixed reviews of the benefits of GDSS. This may be due to the limitations of the research as opposed to the lack of positive effects of using GDSS. The review of prior research reveals five common limitations in

traditional classroom research involving GDSS [Jarvenpaa, 1988].

First, most research focuses on small groups, typically three or four people. Significant impacts may only occur in the use in large groups.

> Because large groups experience more dramatic communication difficulties, group decision support systems may have a more positive impact in large groups [DeSanctis and Gallupe, 1987, pp 598].

Second, past studies used participants who were naive users of the computer. Unfamiliarity of keyboard input may have hampered productivity, experienced users would spend more time on the task and less on the computer.

Third, most studies were single-meeting experiences. This did not allow for learning of the system, which may allow members to realize the benefits of computer technology and how to use the technology.

Fourth, the tasks used in experiments may have been poorly matched with the computer technology used. This can lead to the underutilization of the technology used. The needs of the meeting must match the capabilities of the computer technology.

Fifth, studies have looked at decision rooms as a whole, not at the components of the system. The assessment of the individual components may more accurately asses their usefulness.

Research in GDSS is difficult due to the limited number of products available. Research done in experimental settings appear to have some limitations. With more systems becoming commercially available, future research may validate the benefits of using GDSS.

CHAPTER 4

DESCRIPTION OF METHODOLOGY

This chapter describes the research strategy used to examine factors affecting the successful implementation of a GDSS into an organization. Next, development of the survey instruments and selection of research participants are discussed. Finally this chapter describes the data collection process employed in the research.

Research Design

Factors affecting the successful adoption of GDSS were developed by reviewing articles associated with adoption and assimilation of new information technology and research involving GDSS and the implementation of all types of decision support systems. The study set out to look at the assimilation of GDSS organizations, the management actions taken to introduce GDSS to the employees, and the results of these actions. The research examined only one category of GDSS (Face-To-Face-Conferencing), and only one product within that

category (due to the limited number of products available on the market). This increased the control over the study and allowed a direct comparison of management actions employed by different organizations.

Design of Survey Instruments

The study was designed in two parts. First, a personal interview guide was developed. This was designed with the intention of interviewing a member of management responsible for bringing the OptionFinder into the organization. This was followed by the design of a user survey for the employees who had used OptionFinder in the organization.

The management interview guide (see Appendix B) was developed to gather four types of information. First, the acquisition decision of OptionFinder was probed. This was done by looking at critical incidents, OptionFinder features, and people involved in the decision to purchase.

Second, the process of implementing OptionFinder into the organization was explored. This was done by examining how the OptionFinder was introduced (trial use - whole organization) and the

types of training and support services provided during implementation. Data on the effectiveness of training and support services was also collected.

Third, the data on usage of OptionFinder within the organization was requested. This included number of employees currently using OptionFinder, along with a prediction of future usage. Also requested was the amount of involvement by the information systems organization with OptionFinder and data on how meetings were impacted. Finally, information on problems that had occurred along with what would be done differently was requested.

The user survey (see Appendix D) was designed to collect data on the user's perspective of the implementation process and compare results of management and user views of OptionFinder. The user survey looked at three types of information. First, information on job function, time with company, and when the user first used OptionFinder in the organization was requested. The data on the users current adoption position was also requested, including factors influential in the use of OptionFinder.

Second, data on the types of support services that was provided and used was requested Then the users were asked to rate the usefulness of support and training services offered, what additional services they wanted from management, and how strongly had management encouraged the use of OptionFinder.

Finally, information on how meetings had been affected by the use of OptionFinder and what types of tasks OptionFinder is used for was requested.

Collection of Data

This study focused on the implementation of a Face-To-Face-Conferencing GDSS. A specific product (OptionFinder) was chosen from this category of GDSS. Participants of the study were chosen because of their acquisition of this product. Information on this project was mailed to fourteen companies who expressed interest in participating. Nine of these companies ultimately participated. The collection of data occurred during the first half of 1990.

Participants ranged in size from small consulting firms (seven employees), to divisions in

large corporations (over two thousand employees). Those organizations who had expressed an interest in participating in the research received an executive summary (Appendix A) of the project, a copy of the management interview guide (Appendix B), and four copies of the user survey (Appendix D) with an attached cover letter (Appendix C). The cover letter gave survey participants instructions and a brief explanation of the survey.

An interview was held over the phone with the person responsible for bringing OptionFinder into the organization or someone in management who participated in the introduction of OptionFinder into the organization. The management interview guide was used as an outline for the collection of data. Information was collected on all questions. with additional questions asked in several areas.

After the phone interview, the management representative was asked to distribute the user surveys to members in the organization who had used OptionFinder. Four surveys were provided for distribution, with some companies distributing less then four due to the limited number of people who had used the OptionFinder.

The following chapter presents information gathered from the management interview and the user surveys. Data from the completed user surveys is summarized and presented in Appendix E through H. Chapter 6 presents the interpretation of the information gathered from the research project.

CHAPTER 5

RESULTS OF STUDY

This chapter presents the results of the management interviews and user surveys. It describes the experience of each company, comparing results of the management interviews to user surveys. For each company the discussion includes critical incidents leading to the acquisition of OptionFinder, people influential in using OptionFinder, the training and support services offered, use within the company, meeting impacts, and problems encountered. This is followed by a discussion of what each company would do differently given the chance to start over.

COMPANY A

COMPANY A is a health care organization in the Midwest. The primary business function is providing health care to the public. The company consists of corporate headquarters and fifteen hospitals scattered throughout the Midwest. Members of headquarters planning and marketing staff introduced OptionFinder

into the organization. The management interview guide was conducted with a manager at corporate headquarter. Three users returned their surveys. The company purchased OptionFinder three years ago.

History. The company was looking for technology to replace a process they were doing manually. They planned to use OptionFinder for strategic planning meetings. Corporate marketing would go to the hospitals and conduct planning sessions with each hospital. This required surveying people at the hospital and presenting the results of those surveys. The manual process was very time consuming and raised questions that headquarters was manipulating the numbers in the process. The company saw OptionFinder as a way to speed up this process.

They learned about OptionFinder from a consulting firm. They felt that OptionFinder fit their management style (participative.) The company had used OptionFinder before (through the consulting firm, COMPANY C of this study) and decided to purchase OptionFinder.

Important features influencing the decision to purchase include the immediate feedback of results, the ability to view the vote and compare votes of

subgroups, and additional strategies surfaced from the increased participation. A side benefit from the use was participants nc longer felt headquarters was manipulating the votes to get the desired results. People participating felt that machines could not lie. Management felt using OptionFinder added excitement to the meetings.

Management introduced OptionFinder into all hospitals for a trial use, each hospital was then free to use as determined locally. Those who liked using OptionFinder requested further use. Currently four hospitals use heavily, three medium, and two light. The other six hospitals do not use it at all. A couple of hospitals now use OptionFinder without help from headquarters. The information systems organization has no involvement in the use of OptionFinder.

Training and Support Services. Option Technologies Inc. provided training to one person in the company, then that person experimented with the use of OptionFinder and acted as department expert. The company did not employ any formal training or support services. However, management does facilitate meetings on an as requested basis. Hands-on experimentation was the main way to gain experience.

OptionFinder use within the company was optional. In one hospital, a Catholic nun was a champion and promoted the use of OptionFinder.

Use. Currently about fifty percent of the hospitals use OptionFinder about once a month. Use of OptionFinder is sporadic, increasing when planning sessions occur. Management expects use to remain the same through the next year.

Meeting Impacts. OptionFinder has speeded up the voting process, and provides for increased confidence in the results. Closure on meetings items is reached faster enabling participants to move on to new items. This has resulted in less time spent in meetings.

Problems. Initially, they were over enthusiastic with the technology, and tried using OptionFinder in all meetings. They had problems with the keypads and cables, extra care was needed to ensure proper setup. Currently they don't feel they use OptionFinder to full capacity. If they had the time, they would devote more time to the use of OptionFinder. Setup is time consuming and the system provides a cluttered appearance. A neater appearance and easier setup would improve acceptance of OptionFinder.

User Survey Results. Appendix E contains the details of the survey responses for COMPANY A. Three people completed a user survey, including the management interviewee. All three were in the implementation or confirmation stages of use.

The management respondent reported a recommendation from a friend as the most important factor in using OptionFinder. Other respondents reported company promoted use and recommendation from co-worker as the most important factors.

The most important types of training were hands-on experimentation, on-the-job training and use of the department expert. The ability to learn focused on hands-on experimentation and the sharing of results from using OptionFinder.

Input of all attendees and focus on issues were the most positive meeting impacts, followed by ability to reach consensus. They used OptionFinder most frequently for strategic planning session, strategy development, consumer research, and group planning meetings. The users did not request any additional support services.

COMPANY B

COMPANY B is an information systems provider in the Midwest. The management interview was conducted with the manager of service quality research. The vice president of research and development introduced OptionFinder into the company. Two users returned their surveys. The company purchased OptionFinder one year ago.

History. Members of the company had worked with one of the co-founders of Option Technologies Inc. on several projects and saw OptionFinder in use. Company B purchased OptionFinder to help conduct focus group research. The company felt this would enable them to gain a unique marketing edge, separating themselves from their competitors. They also wanted to take some of the mystery out of focus groups and felt OptionFinder helped determine the reasons behind a participants decision. They have now expanded use to include strategic planning sessions.

Important features influencing the decision to purchase OptionFinder include the ability to immediately display results to participants and customize voting parameters (i.e. items scale). Also important was the ability to setup OptionFinder before

the meeting in order to reduce actual meeting time of all the participants.

The initial introduction of OptionFinder was into one business area. Then they tested OptionFinder in other areas for specific situations. The primary objective was to familiarize people with OptionFinder and show that it is an enhancement to the current way of conducting meetings. Top management has started using OptionFinder. The information systems organization has no involvement in the use of OptionFinder.

Training and Support Services. Initially two people attended a users meeting to learn about OptionFinder. At this meeting too much was going on to learn the system effectively (too many people, not enough time). Trial runs were setup to familiarize themselves on use of the equipment. The most effective way to learn OptionFinder was through hands-on experimentation. Employees would also take OptionFinder home (or to their office) for a couple days to learn the features. Cheat sheets were developed as an aid in using OptionFinder. Facilitators will usually conduct a trial run before each meeting and someone familiar with OptionFinder's

features will act as a consultant. It usually takes employees about three trial runs to gain confidence on using the system, then management encourages the them to use OptionFinder without help. They felt the learning process is a little nerve racking.

Use. Company B uses OptionFinder about once a month ranging from two weeks straight to none for two months. They are hoping for increased usage. About fifty to sixty-five percent of employees have participated in a meeting using OptionFinder, with less than ten percent having facilitated a meeting. They expect the percentage of participants to remain the same and hope the number of facilitators will increase to fifteen percent.

Meeting Impacts. They feel OptionFinder has a positive impact on meetings and helped the prioritization process. Priorities of participants are more clear, people were more hesitant to talk than push a button. The displaying of results seems to give people the permission to disagree, resulting in increased discussion. This helps the person running the meeting gain everyone's opinion.

Problems. They had technical problems with the equipment (lap-top, cables, keyboards). During

meetings facilitators will get stuck and not know how to do what they wanted. In one case a facilitator wrote over the database they had just developed. Paired comparisons votes took a long time if there were a lot of choices.

More training is needed in file maintenance of the system, the ability to link files, and the partitioning of files. The information systems organization does not provide support for OptionFinder. A technology support division provides support to their division, but only supports the mainframe through personnel computers.

User Survey Results. Appendix E contains the details of the survey responses for COMPANY B. Two people completed a user survey, both in the implementation stage. The most important factor in their decision to use OptionFinder was company promoted use. Equally important for one respondent was company required use, while the other respondent cited recommendation from a friend.

The most important type of training was hands-on experimentation, followed by in-house training. Respondent two also reported instruction from outside

specialist, vendor training, and on-the-job training as being very important.

Input of all attendees was the most important meeting impact. Respondent two also cited focus on issues, reach consensus, and teamwork. They used OptionFinder most frequently for conducting customer focus groups, importance and satisfaction ratings, prioritization of issues, and reaching consensus. The users would like more information on creative ways to use OptionFinder.

COMPANY C

COMPANY C is a marketing research company on the West coast. The company employs ten people, with four employees conducting research. Only those conducting research worked with OptionFinder. The management interview was conducted with the vice president of the company. Two users returned their surveys. The company purchased OptionFinder three years ago.

History. As a market research company they deal primarily with focus groups and were looking for a way to get additional benefits. The owner of the

company wanted something to differentiate them from other companies doing the same work and used OptionFinder as a selling point to potential clients. In conducting focus groups, some participants would dominate the discussion, COMPANY C saw OptionFinder as a way to even out the discussion. The outputs were more "powerful" as a result of the increased discussion. Clients were fascinated with the outputs and this increased the satisfaction among clients.

The owner of the company found out about OptionFinder through one of the co-owners of Option Technologies Inc. The ability to prioritize items using paired comparison was an important feature in the decision to purchase OptionFinder. Other important features included the availability of instant feedback, the ability to partition the participants into subgroups, and the ability to combine the voting records from different sessions. Company C introduced OptionFinder into the whole organization at once. There is no person responsible for information systems in the organization.

Training and Support Services. The co-owner of Option Technologies Inc. provided initial training consisting of four people at a half day training

session. This was followed by hands-on experimentation and on-the-job training. On-the-job training and transfer of knowledge to others proved the most successful way to learn. The half day of training in the classroom was not sufficient to learn OptionFinder.

Use. One of the four people could not figure out how to use OptionFinder and left the company. Only two people now use OptionFinder, with a third person learning about it. OptionFinder is used about 200 times a year, this is the expected maximum usage. The owner of the company is the champion of the technology and has strongly encouraged the use of OptionFinder.

Meeting Impact. OptionFinder has helped probe the reasons behind the decisions made by research participants. The ability to prioritize and display results immediately provided additional information behind the participants decision. The output from OptionFinder is a classic graph used in marketing communications, providing a graphic representation of where changes are needed.

Problems. Most difficulties were the result of the setup process. The system is awkward to set up and becomes more difficult as the number of participants rise. There has been some hardware problems. The

ability to troubleshoot the system would enhance OptionFinder.

User Survey Results. Appendix E contains the details of the survey responses for COMPANY C. Two people completed the user survey. The management interviewee was one of those completing a survey and the owner of the company the other. Both were in the confirmation stage of use.

The most important factor in the decision to use OptionFinder was increased productivity. The management respondent also cited recommendation from co-worker, company promoted use, and required to use. The owner responded recommendation from friend and read about product as important factors in the decision to use.

The most useful types of training were hands-on experimentation and on-the-job training, followed by the access to the help line. The management respondent also reported department expert, while the owner reported in-house training.

Input of all attendees was the most important impact on meetings. The owner of the company reported all items (Structure, Communication, Focus on Issues, Input of all attendees, Reach Consensus, Clarify

Outcome, Productivity, Teamwork, Implementation of results, Meeting Quality, Job Satisfaction, and Deal with Conflict) as having a very important meeting impact. While the management respondent rated job satisfaction, structure, reach consensus, and deal with conflict as not being impacted by the use of OptionFinder.

They used OptionFinder most frequently for enhancing focus group research and planning sessions. They did not request any additional support services.

COMPANY D

COMPANY D is a division in an electric appliance producer in the Midwest. The interview was conducted with a manager in the human resources department. Two users returned their surveys. The company purchased OptionFinder one year ago.

History. The company was familiar with several GDSS type products and had used another product with participants in focus groups. They thought OptionFinder was versatile alternative and could have uses for many different types of situations. Using OptionFinder was an extension of the job.

Major reasons for using OptionFinder were the need to conduct requirements planning, customer needs analysis, employee needs analysis, and employee action planning and problem solving. Important features for the purchase of OptionFinder were opportunity mapping and the ability to conduct votes on two dimensions.

Company D originally introduced OptionFinder into the marketing organization of the division only. Developing advertising material and advertising strategy were the originally uses of OptionFinder. The internal advertising marketing council is the primary user of OptionFinder. The information systems organization had no involvement in the introduction of OptionFinder. They now use it for developing systems requirements and the interviewee felt it has helped them a lot. He also felt that the information systems organization needs more knowledge about OptionFinder and should be the main user.

Training and Support Services. The interviewee was the main user and learned through experience with the system. Formal training is provided in facilitation and research. He conducts facilitator training within the organization and facilitates most of the meetings. They also create and design protocol

for OptionFinder sessions and found this type of training to be very effective. People wanting to use OptionFinder will bring a meeting plan to them, if OptionFinder is appropriate for the meeting they develop an OptionFinder session. In some cases they will recommend a different product. There are three people in the organization that provide these services.

Use. They try to educate people on the use of OptionFinder, allowing those who want to try it to do so while discouraging inappropriate use. A few people have over recommended use of OptionFinder and have done as much harm as good. Use is sporadic, anywhere from once a week to once every two months. About twenty percent of the employees have used OptionFinder. They expect use to be the same a year from now.

Meeting Impact. OptionFinder has added diversity to the meetings. It allows the participants to reach an understanding of what is important. The result of the vote and immediate display of the vote provides for quality discussion and decision making.

Problems. Some employees used OptionFinder inappropriately. Inappropriate uses were as a yes/no tool and for voting on to many items. The facilitator guide could use a cautions section for inappropriate

applications of OptionFinder. A competitor created a training program for appropriate uses of their product, they felt a similar training program would be useful for OptionFinder. They did find it very easy to learn from their mistakes.

User Survey Results. Appendix E contains the details of survey responses for COMPANY D. Two people completed the user survey. One was in the implementation stage, while the other had completed a trial use.

The most important factors in use were recommendation from a co-worker and company promoted use. One respondent felt increased productivity was very important, while the other respondent felt it was not important.

On-the-job training was the most useful type of training reported, with one respondent saying hands-on experimentation was important.

Input of all attendees and the ability to reach consensus were important meeting impacts reported. One respondent felt OptionFinder had little or no impact on meetings. They used OptionFinder most frequently for qualifying and identifying critical success factors and

ranking features of products. The users did not request any additional support services.

COMPANY E

COMPANY E is a human resources consulting company, specializing in research and custom design training programs, in the Midwest. They also sell OptionFinder. The interview was conducted with an assistant to the president of the company. Three users returned their surveys. The company purchased OptionFinder three years ago.

History. The president of the company had worked with the co-owner of Option Technologies Inc. and learned about OptionFinder from them. The president of the company is very innovative and liked the uniqueness of OptionFinder, she felt it was an additional tool to use in her business. They have clients come to them to use the product with the company providing facilitation services.

An important feature in OptionFinder is the ability to provide anonymity to participants in the decision making process. The productivity of the meetings and the decision speed are also very important features when using OptionFinder. In the trial use

they felt OptionFinder helped take the tension out of the decision making process and improved the decision making ability and increased team building for their clients.

The introduction of OptionFinder consisted of a demonstration to all employees in the organization and trial use during an annual planning session. Since the organization was small (under ten employees), OptionFinder was used throughout the whole organization and incorporated into the services provided to clients. The company has no information systems organization. They do have a person who is responsible for information systems and is considered the expert in using OptionFinder.

Training and Support Services. Training was through the use of OptionFinder and transfer of information learned to other employees. All employees become familiar with the use of OptionFinder and now have an in-house training program. The resident expert provides support as needed. The company provides training and support services to clients who use and purchase OptionFinder through them. The president of the company has strongly encouraged use.

Use. Within the company OptionFinder is used four times a year, by sixty percent of the employees. They are expecting a slight increase in usage and the percentage of employees who use OptionFinder to reach eighty percent. Clients of the company also use OptionFinder.

Meeting Impacts. Meetings have become more lively and participants more active in the decision process. Meeting productivity has increased and meeting outputs are readily available to all participants.

Problems. Key pad buttons do not always register votes (they are not sensitive to the touch). Setup is time consuming. Ideally they would set up OptionFinder on a permanent basis, reducing preparation time and making it readily accessible. Lack of space is a problem.

User Survey Results. Appendix E contains the details of the survey responses for COMPANY E. Three people completed the user survey, with two people in the confirmation stage and one person (information systems expert) in the implementation stage.

The most important factor in the use of OptionFinder was increased productivity.

Recommendation from a co-worker was second most important, with recommendation from a friend rated third.

All respondents rated hands-on experimentation as a very useful training method, close behind was access to a help line. Third in importance was a combination of on-the-job training and in-house training. Management has strongly encouraged the use of OptionFinder.

All respondents rated input of attendees as a very important meeting impact, followed closely by focus on the issues. Grouped as third most important were structure, communication, and improved productivity. They used OptionFinder most frequently for research, group input, strategic planning, and organizational change (the process with OptionFinder technology shifts mental concepts). The users did not request any additional support services.

COMPANY F

COMPANY F is an information services provider in the Midwest. The human resources division brought OptionFinder into the company. The management interview was conducted with a representative of the

human resources division. One user returned their survey. The company purchased OptionFinder one year ago.

History. The company was looking for a product to streamline the decision making process. A member of the human resources division had used OptionFinder at an executive demonstration and reviewed the material provided at the demonstration. They decided to run a trial session to evaluate OptionFinder on its team building benefits.

Team building was the major reason for the use of OptionFinder. OptionFinder improved the decision making process, resulting in cost savings for the company. The feature considered most important was anonymity of decision making. OptionFinder was originally used with the human resources division and then by members of other divisions working with human resources. The information systems organization does not know of the existence of OptionFinder.

Training and Support Services. Initial training consisted of a two day session conducted by their OptionFinder dealer. No formal training or support services are offered. Training consist of hands-on experience and information passed to other

people learning to use OptionFinder. Five people in the training/organizational development section are in OptionFinder training and are the champions of OptionFinder.

Use. Company F uses OptionFinder once a quarter and two percent of the employees have used it. The goal is to use OptionFinder three times a quarter and have ten percent of the employees use it. OptionFinder use is promoted from the training/organizational development section, very little promotion has occurred outside this section.

Meeting Impact. The company has not been using OptionFinder for meetings, its used mostly for department training, team building sessions, and other special purposes. OptionFinder was used at a all day meetings (see problems). They need more marketing of OptionFinder to increase use and identify meeting impacts.

Problems. For the all day meeting, thirty managers in the company were taken to a off-site location to use OptionFinder. A problem occurred with the portable computer and the meeting was held without using OptionFinder. They feel equipment needs to be tested before each use. The availability of dedicated

space and equipme t for OptionFinder would be helpful. They would like more information on different applications of OptionFinder.

User Survey Results. Appendix E contains the details of the survey response for COMPANY F. One person completed a survey and is in the implementation stage of use. Important factors in their use were recommendation from a friend, recommendation from a co-worker, and increased productivity.

Very effective types of training were hands-on experimentation, instruction from outside specialist, on-the-job training, and vendor training. Very important meeting impacts were structure, communication, focus on issues, input of all attendees, reach consensus, clarify outcome, and productivity. They used OptionFinder most frequently for teambuilding and goal identification. The users did not request any additional support services.

COMPANY G

COMPANY G is a member of the electronics industry from the West. The management interview was conducted with a member of the human resources division. The human resources division introduced

OptionFinder into a personnel research section of their division. Two users returned their surveys. The company purchased OptionFinder one and a half years ago.

History. The personnel research section consists of five people who look at long range research and new technologies. The found OptionFinder was as useful tool for gathering data for their project. A consulting firm recommended OptionFinder to Company G. The first use involved an attitude survey of the employees, determining what they liked and did not like about the company, and was used as initial data to develop more detailed surveys. OptionFinder is currently used for the rating/ranking of personnel on performance and potential, brain storming sessions, and comparing cost versus impact of recommended actions.

The ability to survey large numbers of people quickly was an important feature in the decision to use OptionFinder. Other important features include improved decision making ability and the fact meetings were easy to design. The information systems organization has no involvement in the use of OptionFinder.

Company G introduced OptionFinder on a trial basis to a group of senior managers at an off-site location. They used OptionFinder to sort through strategic plans and a couple managers requested further use of OptionFinder.

Training and Support Services. A consulting firm provided initial training, consisting of fourteen hours over two days. The consulting firm also prepared planning forms to develop meetings. The employees were able to check out equipment and experiment with OptionFinder. OptionFinder manuals were reviewed on an as-needed basis and a workbook was designed to train other people. The human resources division is trying to train people from other locations in the company, this has not been very successful.

Hands-on experimentation while transferring information learned to other group members is the most effective type of training. The facilitator guide developed within the division is also an effective training tool and tells people what to do when using OptionFinder. Human resources facilitates most of the meetings. While training others has failed, the facilitation of meetings has been successful. They feel part of the problem is with OptionFinder. The

mathematics on the consensus chart are "weird". Instead of using standard deviation, OptionFinder uses sum of the differences from the range of the scores. This causes problems when trying to train people on the uses of OptionFinder.

Use. Current usage is twice a month by about five percent of the people. They would like usage to double, but usage is declining. Management has not encouraged the use of OptionFinder to this point. They are planning to advertise it in the management newsletter to try to stimulate use. The technical services section thought about using OptionFinder as a customer services tool, to check the quality of services and what types of services are valuable. They sent a manual to technical services, but no one followed up on the request.

Meeting Impacts. They have used the data from the meetings to set goals. They conduct research on the population to determine issues and trends. This is used as input to strategic goals.

Problems. Keyboard pads would not always register. People would want to rush into the voting process instead of concentrating on the issues. They

were then unclear of what they had voted on and what it meant.

They would like to set up the system on a permanent basis. Most uses are on short notice, it would be more convenient with a room already set up. Connecting terminals is very time consuming, they would like it better if terminals operated on radio frequencies. They feel management needs to be better informed on the uses of OptionFinder. The main problem is lack of knowledge about the system.

User Survey Results. Appendix E contains the details of the survey responses for COMPANY G. Two people completed a user survey, both were in the implementation stage of use.

Hands-on experimentation was the most useful type of training with respondent 1 rating on-the-job training and in-house training as useful. They rated effectiveness of support as low.

Input of all attendees is a very important meeting impact, closely followed by focus on the issues and reach consensus. They used OptionFinder most frequently for group decision making of many related issues, focus groups, and data gathering. The users would like more training and well written manuals.

COMPANY H

COMPANY H is a manufacturer of business forms located in the Midwest. The management interview was conducted with a member of the marketing division. No user surveys were returned. The company purchased OptionFinder two years ago.

History. A member of management saw OptionFinder used and was impressed with its use and benefits. They had just completed a strategic planning session that was very complicated and OptionFinder looked like a solution. They had looked at other software and felt OptionFinder was easier to use.

An important feature was the ability to make quick changes at the last minute. You can restart a vote and add more people very easily. They currently use OptionFinder for mostly training purposes.

When OptionFinder was initially introduced no specific results were in mind. They thought this was a neat product and tried to see where it would fit. Facilitators are generally instructors in front of classes. The information systems organization is aware of OptionFinder but does not provide support for it.

Training and Support Services. Initial training was a sales demo consisting of a one day session for the entire staff. This had to many people to be effective. Training is mostly ad hoc, relying mostly on experience. They help users set up meetings and gain an understanding of how the system works. Most learning takes place by reading manuals and practice.

Use. Current use is once a month by one percent of the employees. They would like to see this double in the next year.

Meeting Impact. Meetings are streamlined, faster, and more productive. OptionFinder has added an element of fun to meetings and helped lessen tensions. When a meeting took a completely different turn causing a re-vote on a different, they were able to do this quickly using OptionFinder.

Problems. Keyboard pads do not always register a vote. People would try voting to soon and then want to restart the vote because they did not understand what they were voting on. They need more people aware of OptionFinder and its uses.

User Survey Results. No users returned a survey.

COMPANY I

COMPANY I is a communications company located on the East coast. The management interview was conducted with the manager of sales effectiveness. No user surveys were returned. The company purchased OptionFinder three years ago.

History. The company had a business need that they thought OptionFinder could satisfy. They developed a business plan to prove to management that OptionFinder was needed for a specific business function. That function disappeared in a reorganization and use of OptionFinder was discontinued. They have some use in focus groups now.

They bought OptionFinder because they felt it was the best software in that category and was portable. Immediate reading from the group decision and the ability to print out results were major features that influenced the decision to buy. One division used OptionFinder and then introduced into other divisions. The information systems department is not involved with OptionFinder. There was no encouragement from management to use OptionFinder or champions within the organization.

Training and Support Services. They attended a three day training session on how to use OptionFinder. This was followed by hands-on experimentation with learning through trial and error. They called Option Technologies Inc. if problems occurred.

Use. They initially used OptionFinder every couple of weeks. They now use OptionFinder once every four months and expect use to stay the same.

Meeting Impacts. They felt OptionFinder helped produce good conclusions.

Problems. No problems reported. They would not buy the OptionFinder again (not enough use). No other organizations ever used. Used occasionally for data collection on focus groups.

User Survey Results. No users returned a survey.

CHAPTER 6

SUMMARY OF RESULTS

This chapter provides an interpretation of the results of the study. It also discusses the limitations of the research and provides direction for further research in this area.

Interpretation of Results

The results of the study suggest that management actions contributed to the use of OptionFinder in the organizations studied. This section discusses management actions taken by companies to introduce OptionFinder into their organization. Guidelines developed based on this discussion appear to contribute to the successful introduction of GDSS technology into an organization. This section then discuses the following; important factors in the respondents decision to use OptionFinder, how management introduced OptionFinder to the employees, types of training found to be most successful, positive

meeting impacts, and problems associated with using OptionFinder.

Depending on the size of the company, most companies initially introduced OptionFinder to a limited number of employees. Small companies introduced OptionFinder to the whole organization at once. In both situations, this enabled a small group of employees to learn and transfer their knowledge to others in the organization.

COMPANY B, COMPANY C, COMPANY D, and COMPANY E, have had the most success introducing OptionFinder into their organizations. Success was measured as companies who have over fifty percent of employees using the system or the number of users is expected to increase. The other companies cite various reasons for lack of use within their organization. Table 2 presents positive factors affecting the assimilation of OptionFinder into an organization (* = yes).

Companies who had champions promoting the use of OptionFinder had better success in the assimilation of OptionFinder into their organizations. The location of the champion within the organization also played a key role. Companies with champions buried deep within the organization

Table 2: Factors Affecting Assimilation of OptionFinder

	A	B	C	D	E	F	G	H	I
* Champion involved with introduction into organization		*	*	*	*	*			
* Management promotes the use of OptionFinder		*	*	*	*				
* Users allowed flexibility to learn OptionFinder		*	*		*		*	*	*
* Company helped facilitate learning		*	*	*			*	*	
* Meeting impacts show the relative advantage of the technology	*	*	*	*	*			*	*

also needed strong upper management support for the adoption of OptionFinder. The appearance of a champion alone did not guarantee adoption. For example, in COMPANY F the champions of OptionFinder are located in one department of the human resources division. Without management support, use of OptionFinder has not spread out of this department.

Those companies who helped employees learn how to facilitate meetings had better success in implementing OptionFinder into the organization. For example, in COMPANY B employees learning to facilitate meetings will conduct trial runs with the system. At these trial runs someone familiar with OptionFinder acts as a consultant, guiding them through a meeting. Most companies relied on hands-on experimentation for their primary source of learning. The learning process was typically drawn out over a long period of time. Most companies cited the need for at least three sessions to become proficient in use of OptionFinder.

Another factor which surfaced in the study was the need to get employees to try the product. Table 3 presents respondent reported important factors in the decision to use OptionFinder (1 = very important - 5 = not important). These results are ranked by importance. They tended to vary across companies. Increased productivity was the highest rated factor in this area. While read about product was the lowest rated factor.

Table 3: Important Factors in the Decision to Use

	Mean	Range
Increased productivity	2.21	1.0 - 3.0
Recommendation from co-worker	2.64	1.0 - 5.0
Company promoted use	2.76	2.0 - 4.0
Recommendation from friend	2.93	1.0 - 5.0
Required to use	3.79	2.5 - 5.0
Read about product	4.03	2.0 - 5.0

The introduction of OptionFinder into the organizations was accomplished in a variety of ways. Table 4 presents management's introduction strategies for OptionFinder.

Companies who introduced OptionFinder to a small number of employees for a specific purpose had more success than the other companies. For example COMPANY B introduced OptionFinder into one business area for a specific situation. The main objective was to familiarize the employees with OptionFinder. In contrast COMPANY F used a trial meeting, but the equipment failed and left a negative impression. COMPANY A and COMPANY G also used a trial run, but did not promote the use of OptionFinder afterwards.

Table 4: Introduction Strategies

COMPANY A	Introduced OptionFinder to management in each hospital. Those who liked it asked to use again. No promotion done.
COMPANY B	Introduced in one business area. Tested on limited basis for specific situations to become familiar with product.
COMPANY C	Introduced into whole company at once. Technology changed how job was done. Company had less than ten employees.
COMPANY D	Introduced in one business area. Used on trial basis.
COMPANY E	Used on trial basis at annual planning session. Then introduced to clients. Company had less than ten employees.
COMPANY F	Used on trial basis in one department. The introduced to other departments.
COMPANY G	Introduced on trial basis to senior management. Those who liked asked to use again. No promotion done.
COMPANY H	Thought product was neat. Experimented with product to see were it would fit.
COMPANY I	Used internally, then went into other organizations to use.

Table 5 presents a summary of the most useful types of training reported by the respondents in each company (1 = very useful, 5 = not useful).

Not all types of training were offered in all companies. In some companies respondents disagreed whether certain types of training were used or not. If a respondent cited "not

applicable", then their answer was excluded from the averages for each company. In several companies, only one employee responded to the survey.

Hands on experience was the most important form of training. In addition, most of the OptionFinder users in each company used one of the other types of training to supplement hands-on experimentation. The employees in COMPANY A used instruction from outside specialist and departmental expert. The employees

Table 5: Importance of Training Methods

	Mean	Range
* Hands-on experimentation	1.21	1.0 - 2.0
* On-the-job training	1.39	1.0 - 2.0
* Departmental Expert	1.83	1.3 - 3.0
* Instruction from outside specialist	2.12	1.0 - 4.0
* Access to help line	2.16	1.3 - 3.0
* In-house training	2.53	1.5 - 4.0
* Vendor training	2.75	1.0 - 4.0
* Computer aided tutorial	3.25	2.0 - 4.0
* Support from Development Center	3.50	3.0 - 4.0

in COMPANY B used in-house training and instruction from outside expert. The employees in COMPANY C used departmental expert and access to help line. The employees in COMPANY D used access to help line. The employees in COMPANY E used access to help line and in-house training. The employees in COMPANY F used vendor training and instruction from outside expert. The employees in COMPANY G used in-house training.

Table 6 presents summary of important meeting impacts from using OptionFinder (1 = highly favorable - 7 = highly unfavorable).

Respondents cited the "input of all attendees" the most favorable impact on meetings. They also rated "focus on issues" and "reach consensus" as positive impacts of using OptionFinder. The use of OptionFinder had the least impact on "job satisfaction" and "implementation of results". These tended to vary across companies. For example, COMPANY C reported OptionFinder as having a important meeting impact on all items. While COMPANY G and COMPANY A only reported focus on issues, reach consensus, and input of all attendees as being important impacts.

Many companies had problems in their initial use of OptionFinder. Most problems were related to equipment failures. Some other problems were related to user error, perhaps due to lack of training.

Table 6: User Reported Meeting Impacts of OptionFinder

	Mean	Range
* Input of all Attendees	1.40	1.0 - 2.0
* Focus on Issues	1.76	1.0 - 3.0
* Reach Consensus	2.01	1.0 - 3.0
* Clarify Outcome	2.33	1.0 - 3.0
* Productivity	2.51	1.0 - 3.5
* Structure	2.67	1.0 - 4.0
* Communication	2.74	1.0 - 4.5
* Meeting Quality	2.79	1.5 - 3.5
* Teamwork	2.86	1.5 - 4.0
* Deal with Conflict	3.04	2.0 - 4.0
* Implementation of Results	3.37	1.0 - 4.5
* Job Satisfaction	3.67	2.5 - 5.0

The most cited hardware problem was with keypad use during meetings. Sometimes keypads did not

register when pushed. This resulted in delaying the meeting to have everyone check and see if they had voted. Another company had equipment failure during a trial run with senior management. This happened at an off-site location. They ended up holding the meeting without using an automated tool. Many companies also cited the time involved in setting up the equipment as a problem. They thought the existence of a permanent site would increase usage.

The most commonly cited human problem was with meeting participants being too anxious to vote. Participants in the meeting would rush to vote on the options without understanding the issues. This required that the meeting return to the discussion stage and hold another vote on the options. Also cited was the overuse of OptionFinder. Some users tried using OptionFinder for everything. They tried force-fitting the technology to the need. They tried using OptionFinder as a yes/no tool and for paired-comparison votes with over twenty-five choices. During initial use employees would try using OptionFinder for every meeting, instead of first determining if OptionFinder was appropriate for the meeting.

Table 7 presents success factors that appear to encourage the employee adoption of OptionFinder. The table is organized along the phases of the innovation-decision process introduced in Chapter 2.

During the knowledge stage employees need exposure to OptionFinder, enabling them to match OptionFinder with a business need. This is usually done through word of mouth.

Table 7: Success Factors in the Employee Adoption of OptionFinder

* Knowledge
Promote benefits of OptionFinder
Provide information on how to use OptionFinder through a newsletters and word of mouth
* Persuasion
Demonstrate OptionFinder at a meeting
Train employees in group dynamics and in the facilitation of meetings
* Decision
Allow employees to learn in the way that suits them best
Use hands-on experimentation along with a training system to facilitate learning
* Implementation
Advertise the successes of OptionFinder
Promote different uses of OptionFinder
Clarify appropriate uses of OptionFinder
* Confirmation
Provide positive reinforcement
Promote appropriate uses of OptionFinder
* Throughout all stages of adoption, management must support the employees decision to use

During the persuasion stage employees are forming a positive or negative opinion about OptionFinder. The use of mass media channels is important. Management should provide a demonstration of OptionFinder and use change agents and champions to promote the advantages of OptionFinder. The use of interpersonal communication channels is important at this time. Management must reduce employee uncertainty and help create a positive opinion about OptionFinder.

During the decision stage employees decide to use or not to use OptionFinder, usually after a trial use. Management should allow employees plenty of time for hands-on experimentation and provide some type of system to assist the learning of OptionFinder. People learning to use OptionFinder should be well versed in running group meetings. Management may need to train potential facilitators in group dynamics.

During the implementation stage employees are using OptionFinder. Companies should promote the successful uses of OptionFinder. Employees need to know the positive meeting impacts associated with using OptionFinder. At this stage employees should be encouraged to try different uses of OptionFinder.

This can lead to the appropriate match with the business need and promote organizational learning.

During the confirmation stage employees are seeking reinforcement for their decision to use. Management must provide positive reinforcement at this time, along with appropriate uses of OptionFinder. Misuse and lack of knowledge about the uses of OptionFinder can lead to rejection.

The information collected in this study was also applied to the components of the three process discussed in Chapter 2 (assimilation, adoption, and action).

Stage of Assimilation. Companies C and E appeared do be in the widespread technology transfer stage of assimilation. The rest of the companies are in the experimentation and learning stage.

Technology Assessment. COMPANY I prepared a justification for purchasing OptionFinder, matching a technology to a well developed need (Issue Driven). Interestingly, this was also only company who said they would not purchase OptionFinder again. COMPANY H bought OptionFinder with no specific results in mind (Technology Driven) because it looked like a neat product. The rest of the

companies purchased OptionFinder using the Opportunistic model approach. They saw a demonstration of OptionFinder and felt it would benefit the organization. They had a specific purpose in mind for OptionFinder.

Organizational Learning. Successful companies provided some type of organized learning procedures to complement hands-on experimentation and on-the-job training. COMPANY B developed cheat sheets and helped employees through trial runs to reinforce lessons learned. COMPANY C developed index cards to guide employees through an OptionFinder session. COMPANY D designed OptionFinder meetings for employees wanting to use the technology. COMPANY G produced a guide for meeting facilitators. COMPANY H provides a departmental expert for employees training on the system. In general, companies who allowed their employees plenty of free time to experiment with the technology, experienced more use than other companies.

Adopter Categories. Given the newness of the technology, most respondents would appear to be in the first two adopter categories (innovator and

early adopter). Each company had someone in the innovator category, who introduced OptionFinder into the organization.

Adoption Decision Stage. One employee in COMPANY D reported being in the persuasion stage of use. Eight respondents reported being in the confirmation stage of use, while the rest (6) reported being in the implementation stage of use.

Communication Channels. Most survey respondents needed exposure to a combination of mass media and interpersonal channels. Reading about the product was not enough to induce most respondents to try OptionFinder. The one company that had high ratings in this area involved the owner of the company, and they were the only person responding for the company on this answer.

The survey response came from a mix of senior management and their employees. This may explain the mixed results between and within companies. No one item dominated importance. Companies may need to appeal to many different motivations to the potential users when introducing OptionFinder.

Change Agents and Opinion Leaders. This survey did not go into enough detail to draw conclusions in these areas. But, since word of mouth was important to many respondents, champions who are also opinion leaders should be more successful at getting others to adopt.

Innovation Characteristics. OptionFinder is a complex tool for most people to learn, requiring additional employee time learning the features of OptionFinder. Improved meeting results are not always readily observable. Participants receive immediate feedback on the results of the meeting, but improvements in the meeting process and decision quality are hard to observe. These factors add to the difficulty in learning to use OptionFinder and slow diffusion through the organization. Most respondents felt OptionFinder was better than other alternatives (relative advantage) and demonstrations of OptionFinder were available. This was an advantage when users were deciding to adopt.

Stage of Growth. COMPANY D is in the Control stage of growth. Employees wanting to use the system must submit a meeting plan, if the requested use is deemed appropriate than an

OptionFinder session is held. COMPANY C is in the maturity stage of growth. Use is at maximum and all employees use or are learning to use OptionFinder. COMPANY I had discontinued use, but is now in the initiation stage (focus group research started). The rest of the companies appear to be in the expansion stage.

Introduction Style. COMPANY C used the hammer approach when introducing OptionFinder. The rest of the companies used the sales approach.

Management Support. For the technology to spread throughout the organization, companies also needed to promote the use of OptionFinder and associated benefits. Companies where OptionFinder use had not spread felt they had not done an adequate job of promoting OptionFinder.

Most companies offered no formal facilitator training. Training was on an ad-hoc basis, with some companies offering informal training. The most productive types of training were hands-on experimentation and on-the-job training. This confirms what management stated in their interviews. These two are very closely related and appear to be more successful in companies who also utilize

informal one-on-one training within their organization.

Some types of informal training offered include development of cheat sheets for reference use, providing facilitator help for trial runs, and organized transfer of experiential knowledge. This tends to verify that learning to use OptionFinder is a long process. Repeated uses with the product are needed in order to become familiar with its functions.

Other Results

Facilitators must be adequately trained in using the technology, as well as how to run meetings. Companies who had facilitators who were experienced in conducting group meetings had better success. Facilitators should be trained in group dynamics before learning to use OptionFinder.

The information systems organization within most companies was not aware of the use of OptionFinder. Those organizations aware of OptionFinder did not provide support for or promote the use of OptionFinder. In one company the information systems organization was using OptionFinder on a limited basis for defining user

requirements. The manager interviewed felt this had helped the information systems organization a lot and they could benefit from increased use of OptionFinder for this purpose.

The human resources organization was the most common location for OptionFinder. Planning and marketing were the other heavy users of the technology.

Research Limitations and Future Research

This study looked at only one product (OptionFinder) within one category of GDSS. The results can not necessarily be generalized to other products or categories of GDSS technology. OptionFinder is a limited form of GDSS and undoubtedly has strengths and limitations which differentiate it from other products.

The response rate of fifty-three percent consisted of only fifteen respondents. In several cases the managers who introduced OptionFinder were the main users and filled out user surveys. Thus some pro-GDSS biases are probably present in the data.

This study was developed based on the premise that companies were providing formal

training and support services to employees learning to use GDSS. This proved untrue, though several companies are offering informal training services. Future studies should place emphasis on how employees learn to use GDSS.

The length of time since each company purchased OptionFinder varied from one to three years. With GDSS in such an early stage of development, there is no way of knowing the average time of the assimilation of GDSS into an organization. In addition, it is difficult to predict what the eventual saturation level will be in each company. Given the time needed to learn the technology sufficiently, many of these companies may eventually reach full assimilation. A study examining how companies change their policies to promote assimilation would provide new information on organizational learning about GDSS.

This study focused on companies who have a pro-adoption bias with regard to GDSS. Companies who discontinued use of OptionFinder after purchasing were reluctant to participate. Appendix F contains a letter from one such company. It states OptionFinder was used at the suggestion of the CEO, but more use is not expected. Several

meetings using OptionFinder were so tedious that resistance to using the system is overwhelming.

Several companies contacted would not participate because they rarely used the product and felt they could not provide any useful information. Future studies could focus on these companies to find out what did not work to help verify critical success factors in implementation.

Future studies can use the results of this study to develop factors influencing the adoption and assimilation of GDSS into organizations. They can use these results as a framework to examine the assimilation of GDSS into different business units within one organization. A study comparing the interaction of employees who are trying to learn and how management facilitates this learning would improve understanding of management actions necessary for the adoption of GDSS technology.

COMPANY A would be a good location for further research. This company used the same procedure to introduce OptionFinder into each business unit (hospital). Each hospital is now in a different assimilation stage. Currently use by the hospitals in this company ranges from a lot to none. An in-depth study examining the different factors in

the assimilation of OptionFinder might clarify critical success factors in OptionFinder implementation. Factors to examine include how initial use differed, management actions taken, and the subsequent assimilation process in each hospital. One apparent difference in a hospital with successful adoption is the existence of a champion.

Summary

While the companies in the study had the technology for less than three years, several have experienced considerable success in implementing GDSS technology.

Those companies providing support for organizational learning, allowing additional learning time, actively promoting the use of OptionFinder, and using it for meetings in which it offers a relative advantage were the most successful.

As the information age progresses, the need for group decisions will increase. Many times organizations develop groups for specific purposes. Often, time is of the utmost importance for these

groups. Thus they must conduct their meetings in a timely fashion while achieving high quality results.

GDSS can help group activities in many ways, providing managers with an additional tool to increase productivity. Although tentative, the findings in this thesis can assist managers in understanding the process involved in the adoption and assimilation of GDSS into their organization.

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Appendix A: Executive Summary of Research Project

RESEARCH PROJECT ON THE EFFECTS OF MANAGEMENT SUPPORT ON THE SUCCESSFUL IMPLEMENTATION OF GROUP DECISION SUPPORT SYSTEMS

EXECUTIVE SUMMARY

OVERVIEW

* Group decision support systems (GDSS) are computer-based systems concerned with group communications and how to improve it. Through a sample of companies who have implemented Face-To-Face Conference capabilities (or decision rooms), examine types of management support and how they influence the success of the GDSS implementation. Each sample will consist of an IS manager and at least three users of GDSS. Each sample will compare factors in the successful adoption of a GDSS.

OBJECTIVE

* With organizations increasing the use of GDSS, there is strong interest in successfully implementing this new technology. This study seeks to gain insight into user adoption patterns, and the critical factors for successful implementation.

RESEARCH SAMPLE

* An in depth look at companies who have implemented a GDSS.

DATA COLLECTION

* Data on a company's experience will be collected through interviews, with follow-up mail survey and telephone interviews of technical managers and end-users.

TIME FRAME

* Surveys and Interviews are being conducted from Mar 1 to Apr 15, 1990.
* Research results will be available by June, 1990.

CONFIDENTIALITY

* Much of the data being collected is sensitive in nature. The information provided will be held in the strictest confidence. Survey and interview responses will be kept confidential. Names and other details will not be discussed outside the research Emerging Technologies program of the University of Colorado.

POTENTIAL BENEFITS FOR PARTICIPANTS

* Participating firms will receive a summary of research results so they can compare their experiences with other respondents.

Project Contact: George Crouse (MS Candidate)
Graduate School of Business Administration
University of Colorado Boulder
(303) 530-5668

Appendix B: Interview Guide

INTERVIEW GUIDE
Name of organization _____
Date of Interview _____

1. What critical incidents led to your acquisition of OPTIONFINDER? (unique situations, people involved-champions, business need)
2. When was OPTIONFINDER first offered in your company?
3. If your organization used OPTIONFINDER and discontinued use, can you discusss the reasons why?
4. What were the major reasons you decided to use OPTIONFINDER?
5. What features were considered most important?
6. How did your company introduce OPTIONFINDER into the organization? (trial use - whole organization)
7. What types of training did you use?
8. Is this training still being used?
9. What types of training were most effective?
10. What type of support services does your company provide?
11. How often does your company perform those support services?
12. How effective is the OPTIONFINDER support provided?
13. How strongly have you encouraged the use of OPTIONFINDER?
14. Were there users who were instrumental in the use of OPTIONFINDER? (Did they act as "champions" of the technology?)
15. How often is OPTIONFINDER used in your company?
16. About how often do you think it will be used a year from now?
17. About what percentage of the employees have used OPTIONFINDER?
18. About what percentage will use it a year from now?
19. How have meetings been impacted?
20. What problems have occurred during your use of OPTIONFINDER?
21. What would you do differently if you could?

Appendix C: Cover letter to Research Participants

The Effects of Management Support on the Successful Implementation of Group Decision Support Systems

SURVEY INSTRUCTIONS:

This questionnaire has been designed to gain understanding of how GDSS technology was introduced into your organization, and the management support provided. By examining these activities, this research aims to understand the critical success factors for the successful use of GDSS technology.

This survey should take about 15 minutes to complete. Your answers should be based on your personal experiences in using GDSS technology. Your participation is completely voluntary and you may omit answers to any question or withdraw at any time.

All responses are strictly confidential. Your name is requested to provide control over duplicate responses and to send you results of the completed survey. Names and other details will not be disclosed to anyone outside of the Emerging Technologies research program of the University of Colorado. Only summary results will be available to the public.

Please respond as soon as possible. Your participation is greatly appreciated. Call George Crouse if you have any questions regarding this survey or the research project.

George Crouse (303) 530-5668
Graduate Student
Research Coordinator
Emerging Technologies Project
Project

James Brancheau (303) 492-5830
Faculty Advisor
Project Director
Emerging Technologies

Appendix D: Individual Survey - Page 1 of 4

INDIVIDUAL SURVEY **CONTROL #:_____**
University of Colorado at Boulder

Name: _____ Title: _____

When did you start working for this company? _____

Which of the following best describes your everyday job function? (circle more than one if applicable)

Planning Marketing Sales Finance Other _____

*The following questions are about **your personal experience** in using OPTIONFINDER at this organization. Your participation is completely voluntary and you may omit answers to any question or withdraw at any time.*

1. Please indicate which of the following best indicates your current position with respect to OPTIONFINDER. _____

a. Know about the existence of the OPTIONFINDER.

b. Have formed a positive or negative opinion about OPTIONFINDER.

c. Decided to try OPTIONFINDER.

d. Have completed a trial use of OPTIONFINDER.

e. Use OPTIONFINDER sometimes, expect more use in the future.

f. Use is close to the maximum you expect to use OPTIONFINDER.

2. If you have already used OPTIONFINDER for the first time, when did you first start using it? _____ Month/year

3. How important were the following factors in the use of OPTIONFINDER?

	Not Important				**Very Important**
Recommendation from co-worker	1	2	3	4	5
Recommendation from friend	1	2	3	4	5
Read about product	1	2	3	4	5

Appendix D: Individual Survey - Page 2 of 4

	Not Important				Very Important
Company promoted use	1	2	3	4	5
Required to use	1	2	3	4	5
Increased productivity	1	2	3	4	5
Other (Please Specify)	1	2	3	4	5

4. Did group members (during your first use of the OPTIONFINDER) influence your decision on the use of a OPTIONFINDER? _____ If yes, How?

5. When was OPTIONFINDER first offered in your company? _____

6. How often do you request the following support services.

	Daily	Weekly	Monthly	Yearly	Never
OPTIONFINDER Consulting Service	1	2	3	4	5
Training on OPTIONFINDER	1	2	3	4	5
Technical Support	1	2	3	4	5
Facilitate a OPTIONFINDER Meeting	1	2	3	4	5
Department expert	1	2	3	4	5
Other (Please Specify)	1	2	3	4	5

7. Please rate these Services with respect to usefulness.

	Very Useful				Not Useful	
Service	1	2	3	4	5	N/A
OPTIONFINDER Consulting						
Training on OPTIONFINDER	1	2	3	4	5	N/A

Appendix D: Individual Survey - Page 3 of 4

	Very Useful				Not Useful	
Technical Support	1	2	3	4	5	N/A
Facilitate a OPTIONFINDER Meeting	1	2	3	4	5	N/A
Department expert	1	2	3	4	5	N/A
Other(Please Specify)	1	2	3	4	5	N/A

8. Please rate the following types of training according to how helpful they were in using OPTIONFINDER.

	Not Useful				Very Useful	
Hands on experimentation	1	2	3	4	5	N/A
Instruction from an outside specialist	1	2	3	4	5	N/A
On Job Training	1	2	3	4	5	N/A
Vendor training	1	2	3	4	5	N/A
In-House Training	1	2	3	4	5	N/A
Computer Aided Tutorial	1	2	3	4	5	N/A
Support from Development Center	1	2	3	4	5	N/A
Access to Help Line	1	2	3	4	5	N/A
Department Expert	1	2	3	4	5	N/A

9. How strongly has management encouraged the use of OPTIONFINDER?

Low				High
1	2	3	4	5

10. What services would you like to see added, to improve management support?

1. _____

2. _____

3. _____

Appendix D: Individual Survey - Page 4 of 4

11. Overall, how effective would you rate management's support of OPTIONFINDER?

Low				**High**
1	2	3	4	5

12. How has the use of the OPTIONFINDER affected the following aspects of your meetings.

	Highly Favorable			**Neutral**			**Highly Unfavorable**	
Structure	1	2	3	4	5	6	7	N/A
Communication	1	2	3	4	5	6	7	N/A
Focus on Issues	1	2	3	4	5	6	7	N/A
Input of all attendees	1	2	3	4	5	6	7	N/A
Reach Consensus	1	2	3	4	5	6	7	N/A
Clarify Outcome	1	2	3	4	5	6	7	N/A
Productivity	1	2	3	4	5	6	7	N/A
Teamwork	1	2	3	4	5	6	7	N/A
Implementation OF Results	1	2	3	4	5	6	7	N/A
Meeting Quality	1	2	3	4	5	6	7	N/A
Job Satisfaction	1	2	3	4	5	6	7	N/A
Deal with Conflict	1	2	3	4	5	6	7	N/A
Other (Please Specify)	1	2	3	4	5	6	7	N/A

13. What type of task do you most frequently use OPTIONFINDER for?

1. _____

2. _____

3. _____

Appendix E: Individual Survey Results

SUMMARY OF INDIVIDUAL SURVEY	COMPANY A		
Number of Responses:	3 of 4		75.00%
	31	32	33
Start Date with Company	6/87	1/86	1/84
Job Function			
Finance			
Planning	x	x	x
Marketing	x		
Sales			
Other			
Current usage stage a = 1 to f = 6	5	6	6
First use	1/88	84?	7/87
First offered in company	1/88	83?	7/87
IMPORTANT FACTORS IN USE OF OPTIONFINDER			
Recommendation from co-worker	5	5	1
Recommendation from friend	1	1	4
Read about product	1	1	2
Company promoted use	5	5	2
Required to use	5	2	1
Increased productivity	4	4	1
Other			
FREQUENCY SUPPORT SERVICES REQUESTED			
Consulting	5	5	4
Training	5	5	4
Technical Support	5	5	4
Facilitate a meeting	5	6	3
Department expert	5	6	5
Other			

Appendix E: Individual Survey Results

RATING OF SERVICES PROVIDED			
Consulting	n/a	2	4
Training	n/a	n/a	4
Technical Support	n/a	n/a	4
Facilitate a meeting	n/a	2	2
Department expert	n/a	2	4
Other			
USEFULNESS OF TRAINING			
Hands on experimentation	4	n/a	5
Instruction from outside specialist	n/a	n/a	5
On the job training	5	n/a	5
Vendor training	n/a	n/a	2
In-house training	n/a	n/a	2
Computer aided tutorial	n/a	n/a	2
Support from Development Center	n/a	n/a	2
Access to help line	n/a	n/a	3
Department Expert	5	5	4
MANAGEMENT'S ENCOURAGEMENT TO USE	5	3	2
EFFECTIVENESS OF SUPPORT	5	3	3
MEETING IMPACTING			
Structure	4	2	3
Communication	3	5	3
Focus on Issues	2	2	2
Input of all attendees	1	3	2
Reach consensus	2	2	3
Clarify outcome	2	4	3
Productivity	4	3	3
Teamwork	3	4	4
Implementation of Results	4	4	5
Meeting Quality	4	3	3
Job Satisfaction	4		3
3.50			
Deal with Conflict	3	3	4
Other			

Appendix E: Individual Survey Results

SUMMARY OF INDIVIDUAL SURVEY	COMPANY B	
Number of Responses:	2 of 4	50.00%
	36	38
Start Date with Company	3/89	86
Job Function		
Finance		
Planning		
Marketing		
Sales		
Other	x	x
Current usage stage a = 1 to f = 6	5	5
First use	3/89	2/89
First offered in company	88	88
IMPORTANT FACTORS IN USE OF OPTIONFINDER		
Recommendation from co-worker	1	3
Recommendation from friend	1	4
Read about product	1	2
Company promoted use	5	3
Required to use	5	2
Increased productivity	3	3
Other		
FREQUENCY SUPPORT SERVICES REQUESTED		
Consulting	5	4
Training	5	4
Technical Support	5	4
Facilitate a meeting	5	3
Department expert	5	?
Other		

Appendix E: Individual Survey Results

RATING OF SERVICES PROVIDED		
Consulting	n/a	2
Training	n/a	1
Technical Support	n/a	2
Facilitate a meeting	n/a	3
Department expert	n/a	
Other	n/a	
USEFULNESS OF TRAINING		
Hands on experimentation	5	5
Instruction from outside specialist	n/a	5
On the job training	3	5
Vendor training	n/a	5
In-house training	4	5
Computer aided tutorial	n/a	4
Support from Development Center	n/a	3
Access to help line	n/a	3
Department Expert	n/a	
MANAGEMENT'S ENCOURAGEMENT TO USE	5	3
EFFECTIVENESS OF SUPPORT	?	3
MEETING IMPACTING		
Structure	3	5
Communication	4	3
Focus on Issues	4	2
Input of all attendees	1	2
Reach consensus	n/a	2
Clarify outcome	3	2
Productivity	n/a	3
Teamwork	n/a	2
Implementation of Results	n/a	3
Meeting Quality	4	3
Job Satisfaction	n/a	5
Deal with Conflict	n/a	3
Other		

Appendix E: Individual Survey Results

SUMMARY OF INDIVIDUAL SURVEY	COMPANY C	
Number of Responses:	2 of 2	100.00%
	29	30
Start Date with Company	86	3/84
	I	
Job Function		
Finance		
Planning		
Marketing		
Sales		
Other	x	x
Current usage stage a = 1 to f = 6	6	6
First use	87	8/86
First offered in company	87	8/86
IMPORTANT FACTORS IN USE OF OPTIONFINDER		
Recommendation from co-worker	5	1
Recommendation from friend		5
Read about product		4
Company promoted use	5	1
Required to use	5	1
Increased productivity	4	5
Other		5
FREQUENCY SUPPORT SERVICES REQUESTED		
Consulting		5
Training		5
Technical Support	3.5	3
Facilitate a meeting		5
Department expert		5
Other		

Appendix E: Individual Survey Results

RATING OF SERVICES PROVIDED

Consulting	?
Training	3
Technical Support	1
Facilitate a meeting	n/a
Department expert	n/a
Other	

USEFULNESS OF TRAINING

Hands on experimentation	5	5
Instruction from outside specialist	2	4
On the job training	5	5
Vendor training	1	4
In-house training	3	n/a
Computer aided tutorial	n/a	n/a
Support from Development Center		n/a
Access to help line	4	5
Department Expert	5	n/a
MANAGEMENT'S ENCOURAGEMENT TO USE	5	5
EFFECTIVENESS OF SUPPORT	5	5

MEETING IMPACTING

Structure	3	1
Communication	2	1
Focus on Issues	2	1
Input of all attendees	1	1
Reach consensus	3	1
Clarify outcome	2	1
Productivity	2	1
Teamwork	2	1
Implementation of Results		1
Meeting Quality	2	1
Job Satisfaction	4	1
Deal with Conflict	3	1
Other	1	

Appendix E: Individual Survey Results

SUMMARY OF INDIVIDUAL SURVEY	COMPANY D	
Number of Responses:	2 of 4	50.00%
	60	62
Start Date with Company	7/78	
11/88		
Job Function		
Finance		
Planning		
Marketing	x	
Sales		
Other		x
Current usage stage	2	5
a = 1 to f = 6		
First use	12/88	5/89
First offered in company	12/88	
IMPORTANT FACTORS IN USE OF OPTIONFINDER		
Recommendation from co-worker	4	3
Recommendation from friend	1	1
Read about product	3	1
Company promoted use	4	3
Required to use	3	1
Increased productivity	5	1
Other	5	1
FREQUENCY SUPPORT SERVICES REQUESTED		
Consulting	5	5
Training	5	5
Technical Support	4	5
Facilitate a meeting	5	4
Department expert	5	
Other		

Appendix E: Individual Survey Results

RATING OF SERVICES PROVIDED		
Consulting	n/a	n/a
Training	n/a	n/a
Technical Support	2	n/a
Facilitate a meeting	n/a	3
Department expert	n/a	
Other		
USEFULNESS OF TRAINING		
Hands on experimentation	5	n/a
Instruction from outside specialist	n/a	n/a
On the job training	5	3
Vendor training	n/a	n/a
In-house training	n/a	n/a
Computer aided tutorial	3	n/a
Support from Development Center	n/a	n/a
Access to help line	4	n/a
Department Expert	n/a	3
MANAGEMENT'S ENCOURAGEMENT TO USE	4	2
EFFECTIVENESS OF SUPPORT	4	2
MEETING IMPACTING		
Structure	3	3
Communication	3	3
Focus on Issues	1	3
Input of all attendees	1	3
Reach consensus	2	4
Clarify outcome	2	4
Productivity	2	4
Teamwork	2	4
Implementation of Results	3	4
Meeting Quality	1	4
Job Satisfaction	2	4
Deal with Conflict	2	4
Other		

Appendix E: Individual Survey Results

SUMMARY OF INDIVIDUAL SURVEY	COMPANY E		
Number of Responses:	3 of 4		75.00%
	39	42	41
Start Date with Company	7/89	4/88	6/87
Job Function			
Finance			
Planning			
Marketing			
Sales			
Other	x	x	x
Current usage stage a = 1 to f = 6	6	6	5
First use	3/88	9/88	6/88
First offered in company	6/88	6/88	6/88
IMPORTANT FACTORS IN USE OF OPTIONFINDER			
Recommendation from co-worker	5	4	4
Recommendation from friend	5	4	3
Read about product	3	1	2
Company promoted use	2	5	4
Required to use	2	1	1
Increased productivity	5	5	5
Other		1	5
FREQUENCY SUPPORT SERVICES REQUESTED			
Consulting	3	5	4
Training	5	5	4
Technical Support	3	4	4
Facilitate a meeting	3	5	5
Department expert	2	5	5
Other		3	4

Appendix E: Individual Survey Results

RATING OF SERVICES PROVIDED			
Consulting	1	n/a	1
Training	1	n/a	1
Technical Support	1	2	1
Facilitate a meeting	1	n/a	3
Department expert	1	2	5
Other		n/a	1
USEFULNESS OF TRAINING			
Hands on experimentation	5	5	5
Instruction from outside specialist	3	2	5
On the job training	4	5	4
Vendor training	3	n/a	3
In-house training	5	5	3
Computer aided tutorial	2	n/a	n/a
Support from Development Center		n/a	n/a
Access to help line	5	4	5
Department Expert	5	3	expert
MANAGEMENT'S ENCOURAGEMENT TO USE	5	5	5
EFFECTIVENESS OF SUPPORT	5	4	5
MEETING IMPACTING			
Structure	2	1	2
Communication	2	1	2
Focus on Issues	1	1	2
Input of all attendees	1	1	1
Reach consensus	3	2	3
Clarify outcome	2	3	1
Productivity	2	2	1
Teamwork	2	3	2
Implementation of Results	4	3	4
Meeting Quality	3	2	2
Job Satisfaction	3	3	n/a
Deal with Conflict	2	3	4
Other			

Appendix E: Individual Survey Results

SUMMARY OF INDIVIDUAL SURVEY	COMPANY F	
Number of Responses:	1 of 2	50.00%
	23	
Start Date with Company	88	
Job Function		
Finance		
Planning		
Marketing		
Sales		
Other	x	
Current usage stage a = 1 to f = 6	5	
First use	6/89	
First offered in company	6/88	
IMPORTANT FACTORS IN USE OF OPTIONFINDER		
Recommendation from co-worker	5	
Recommendation from friend	5	
Read about product	1	
Company promoted use	1	
Required to use	1	
Increased productivity	5	
Other		
FREQUENCY SUPPORT SERVICES REQUESTED		
Consulting	5	
Training	4	
Technical Support	4	
Facilitate a meeting	5	
Department expert	5	
Other		

Appendix E: Individual Survey Results

RATING OF SERVICES PROVIDED	
Consulting	n/a
Training	3
Technical Support	3
Facilitate a meeting	n/a
Department expert	n/a
Other	
USEFULNESS OF TRAINING	
Hands on experimentation	5
Instruction from outside specialist	5
On the job training	5
Vendor training	5
In-house training	3
Computer aided tutorial	n/a
Support from Development Center	n/a
Access to help line	n/a
Department Expert	n/a
MANAGEMENT'S ENCOURAGEMENT TO USE	3
EFFECTIVENESS OF SUPPORT	4
MEETING IMPACTING	
Structure	1
Communication	1
Focus on Issues	1
Input of all attendees	1
Reach consensus	1
Clarify outcome	1
Productivity	1
Teamwork	4
Implementation of Results	4
Meeting Quality	3
Job Satisfaction	4
Deal with Conflict	3
Other	

Appendix E: Individual Survey Results

SUMMARY OF INDIVIDUAL SURVEY	COMPANY G	
Number of Responses:	2 of 4	50.00%
	47	49
ave Start Date with Company	89	81
Job Function		
Finance		
Planning		
Marketing		
Sales		
Other	x	x
Current usage stage a = 1 to f = 6	5	5
First use	11/89	10/88
First offered in company	89	11/88
IMPORTANT FACTORS IN USE OF OPTIONFINDER		
Recommendation from co-worker		1
Recommendation from friend		1
Read about product		1
Company promoted use	4	1
Required to use	1	1
Increased productivity	3	3
Other	3	4
FREQUENCY SUPPORT SERVICES REQUESTED		
Consulting	5	4
Training	4	4
Technical Support	5	4
Facilitate a meeting	4	3
Department expert	5	
Other	5	

Appendix E: Indvidual Survey Results

RATING OF SERVICES PROVIDED		
Consulting		3
Training	4	4
Technical Support		4
Facilitate a meeting	1	n/a
Department expert		n/a
Other		
USEFULNESS OF TRAINING		
Hands on experimentation	3	5
Instruction from outside specialist		2
On the job training	4	n/a
Vendor training		2
In-house training	4	
Computer aided tutorial		n/a
Support from Development Center		n/a
Access to help line		n/a
Department Expert		n/a
MANAGEMENT'S ENCOURAGEMENT TO USE	3	3
EFFECTIVENESS OF SUPPORT	1	3
MEETING IMPACTING		
Structure	4	2
Communication	3	5
Focus on Issues	2	1
Input of all attendees	1	1
Reach consensus	1	2
Clarify outcome	4	2
Productivity	3	4
Teamwork	4	3
Implementation of Results	4	5
Meeting Quality	3	3
Job Satisfaction	4	n/a
Deal with Conflict	4	4
Other	4	

Appendix F: Important Factors in the Decision to Use OptionFinder

	A	B	C	D	E	F	G
Recommendation from coworker	1.3	4.0	3.0	2.5	1.7	1.0	5.0
Recommendation from friend	3.0	3.5	1.0	5.0	2.0	1.0	5.0
Read about Product	4.7	4.5	2.0	4.0	4.0	4.0	5.0
Company Promoted use	2.0	2.0	3.0	2.5	2.3	4.0	3.5
Required to Use	3.3	2.5	3.0	4.0	4.7	4.0	5.0
Increased Productivity	3.0	3.0	1.5	3.0	1.0	1.0	3.0

Appendix G: User Reported Productive Training Types

	A	B	C	D	E	F	G
* Hands on experimentation	1.5	1.0	1.0	1.0	1.0	1.0	2.0
* Instruction from outside specialist	1.0	1.0	3.0	n/a	2.7	1.0	4.0
* On the job training	1.0	2.0	1.0	2.0	1.7	1.0	1.0
* Vendor training	4.0	1.0	3.5	n/a	3.0	1.0	4.0
* In-house training	4.0	1.5	3.0	n/a	1.7	3.0	2.0
* Computer aided tutorial	4.0	2.0	n/a	3.0	4.0	n/a	n/a
* Support from Development Center	4.0	3.0	n/a	n/a	n/a	n/a	n/a
* Access to help line	3.0	3.0	1.5	2.0	1.3	n/a	n/a
* Departmental Expert	1.3	n/a	1.0	3.0	2.0	n/a	n/a

Appendix H: Important Meeting Impacts

	A	B	C	D	E	F	G
* Structure	3.0	4.0	2.0	3.0	2.7	1.0	3.0
* Communication	3.7	3.5	1.5	3.0	2.0	1.0	4.5
* Focus on Issues	2.0	3.0	1.5	2.0	1.3	1.0	1.5
* Input of all Attendees	2.0	1.5	1.0	2.0	1.3	1.0	1.0
* Reach Consensus	2.3	2.0	2.0	3.0	2.3	1.0	1.5
* Clarify Outcome	3.0	2.5	1.5	3.0	2.3	1.0	3.0
* Productivity	3.3	3.0	1.5	3.0	2.3	1.0	3.5
* Teamwork	3.7	2.0	1.5	3.0	2.3	4.0	3.5
* Implementation of Results	4.3	3.0	1.0	3.5	3.3	4.0	4.5
* Meeting Quality	3.3	3.5	1.5	2.5	2.7	3.0	3.0
* Job Satisfaction	3.5	5.0	2.5	3.0	3.7	4.0	4.0
* Deal with Conflict	3.3	3.0	2.0	3.0	2.7	3.0	4.0

Appendix I: Letter From Non-Respondent

March 19, 1990

Mr. George Crouse
Emerging Technologies Group - GDSS
College of Business Administration
University of Colorado
Campus Box 419
Boulder, CO 80309-0419

Dear Mr. Crouse,

I received your survey in the mail, and after looking it over, feel I will not be of much help to you. The OptionFinder is used primarily in consumer focus groups here, rather than as a decision support system. We have used it in a few management meetings, at the suggestion of the CEO, but I don't expect it to be widely used in this manner. Several of our experiences were so tedious (variable lists were far too long) that resistance to using the system is overwhelming. We joke about using it as an instrument of torture for difficult colleagues.

I'm sorry I cannot be of more help. Good luck in your research.

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