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Technology and Group Decision Process in Going-Concern Judgements*

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Abstract

Accounting and auditing practices are continually being affected by advances in technology. This study empirically examined the effect of group decision processes and technological advances on group going-concern decision making. Groups with access to group decision support systems (GDSS) were compared to groups without access to GDSS for their going-concern judgments. The results show group discussion induced auditors to be more conservative and to consider factors which may have overlooked at the individual level, though neither structure significantly reduced the considerable variance in the individual going-concern judgments. Further, as compared to their counterparts in the face-to-face discussion groups, GDSS groups indicated much higher confidence in their group's final assessment of the client's going-concern status and a higher level of satisfaction and agreement with the group decision processes. The findings suggest that while group discussions did not significantly reduce auditors' considerable variance in going-concern judgments, future research should investigate which explicit models would improve the consensus on going-concern evaluations.

Key words: group decision, going-concern judgments, groupware, confidence, consensus

Introduction

Statement on Auditing Standards No. 59 (AICPA 1988) specifies that on every audit an auditor must explicitly conclude whether an audit client will continue as a going concern If the auditor has substantial doubt about the client's going-concern status, a modified audit report must be issued. Auditors have indicated that evaluating a client's going-concern status can be a difficult audit judgment (Chow, McNamee & Plumlee 1987). In questionable going-concern situations, auditors often disagree on the appropriate audit report (see Asare 1990 for a review). Kida (1980), for example, found that a firm identified as having going-concern problems did not necessarily receive a qualified audit opinion. He attributed this finding in part to conflicting economic considerations (e.g., an auditor might want to retain an audit client but fear potential litigation initiated by the client's investors). Ho (1994), on the other hand, suggests that auditors' disagreement on audit report decisions may be attributed to their lack of consensus on the perceived likelihood that a firm will continue as a going concern.

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Evaluating an audit client's going-concern status is an unstructured task. While going-concern judgments are, in practice, made by an interactive audit group (including a supervising senior, a manager, an engagement partner, and possibly a review partner) and require considerable information exchange, the studies mentioned above were conducted at the individual-judgment level. To increase the external validity of the findings, going-concern judgments should be studied in a multiperson setting. Further, the group process itself may add facets to decision making or may alter the outcome of the decision process (Einhom, Hogarth and Klempner 1977). For example, group members may combine their knowledge and expertise together and also consider factors which an auditor working alone might overlook. Therefore, even though additional experience did not diminish the considerable disagreement on going-concern judgments (Ho 1994), the consensus may be improved in the multiperson setting.

Technology can be viewed as an "exogenous force which determines or strongly constrains the behavior of individuals and organizations" (Markus and Robey 1988, p. 585). As technological advances have occurred in the use and application of computers, virtually all major public accounting firms have committed resources to develop local or wide-area networks and expert systems or decision support systems. Using decision support systems and expert systems in audit decision making can enhance the effectiveness and efficiency of audit engagements (Messier 1995). However, despite the impact of networks on accounting firms' communication channels and operations, most previous studies of decision support systems in accounting and auditing have focused primarily on decision making at the individual level.

Group decision support systems (GDSS), a type of advanced information technology, combines computing, communications, and decision support capabilities to aid in group idea generation, planning, problem solving, and choice making (e.g., DeSanctis and Gallupe 1987). During the 1980's and 1990's, GDSS have received increasing attention in the fields of management and management information systems (see Kraemer and Pinsonneault 1989; Jessup and Valacich 1992 for reviews). GDSS may play an important role in accounting firms' networks for facilitating audit group decision making. However, due to the low availability of the necessary technological facilities, this research is still in its infancy in accounting and auditing.

Gallupe, DeSanctis and Dickson (1988), in a management information system context, have suggested that GDSS are particularly effective for unstructured tasks. Campbell (1990) also pointed out that unstructured audit decisions benefit from the use of GDSS. In general, unstructured tasks are unique, have undefined alternatives, and require both judgment and insight to be performed successfully. Since GDSS invite equal and full participation and involve significant information exchange, they can greatly enhance the generation of alternatives and methods for problem solving in unstructured tasks (Nunamaker, Apllegate and Konsynski 1987). However, mixed findings were reported on the effect of GDSS on improving group consensus and decision quality (see George et al. 1990). Therefore, studying how a GDSS affects auditors' going-concern judgments will provide an assessment of the possible gains and losses associated with the use of GDSS.

In this study, *GroupSystem*, a standard commercial GDSS software package, was used to test empirically the efficacy of technology on auditors' group going-concern judgments.

Going-concern judgments of GDSS groups (i.e., groups with GDSS support) were compared to those of face-to-face groups (Non-GDSS group – groups without access to GDSS). Moreover, the perceptions of these two groups' members were compared with regard to the degree of agreement with the final group judgment (i.e., a measure of deviation within the group), their satisfaction with the group decision process, and their confidence in the group going-concern judgment. Since the auditors were asked to make individual going-concern judgments before, as well as after their group discussions, this study compares their pre- and post-group-discussion going-concern judgments. Such comparisons can provide a better understanding of the effects of group decision making on auditors' going-concern judgments and help us examine whether the use of groups offers an advantage for reducing variances among auditors' judgments.

The results show that the use of groups does not significantly reduce the variance among auditors' going-concern judgments. However, participants in GDSS groups indicated a higher confidence in their group going-concern judgments, a higher level of satisfaction with the group decision processes, and a higher agreement with the group going-concern judgments than did their Non-GDSS counterparts. Furthermore, comparing individual auditors' going-concern judgments with group going-concern judgments shows that the group discussion processes led auditors to consider factors which they had overlooked in the individual decision context.

The rest of the paper is organized as follows. Section 2 provides a literature review of group decisions and GDSS research as well as the hypotheses of interest. Section 3 describes the research design and procedure, and section 4 contains statistical analyses. The final section presents a discussion of the study's results.

Background and hypotheses development

Group decisions

Research on group decision making has revealed significant differences between individual and group judgments (Trotman, Yetton and Zimmer 1983, Chalos 1985; Libby, Trotman and Zimmer 1987). One possible benefit of the group decision making process is the improvement in decision quality that may result when the decision is based on input from the most proficient member(s), or from members of a group instead of on the expertise of an individual working alone (Einhorn, Hogarth and Klempner 1977). Group judgment can be conceptualized as a weighted combination of the opinions of its members, with improvement due to reduction of two sources of error in individual judgments: random error about the mean and systematic bias (Libby, Trotman and Zimmer 1987). In a multiperson decision-making setting in which the members' individual knowledge and expertise are pooled, synergy may cause them to consider mitigating factors and indicators that signal the client's going-concern problems. That is, group discussion may provide incentives for members to exert significantly more cognitive effort that will lead to a more thorough and deeper exploration of the related issues. Thus the auditors may consider factors they might have overlooked at the individual level. Group decision making thus may result in a higher level of consensus.

Also, more thorough communications produce a magnitude of useful information for group discussion, which may subsequently increase participants' confidence in the resulting judgments. The above discussions lead to the following two hypotheses:

HI: Group discussions affect auditors' going-concern judgments and lead them to reach higher levels of consensus.

H2: Group discussions lead auditors to have greater confidence in their going-concern judgments.

GDSS research

Since the 1960s, support of group decision making via information technology has received increased attention (see Kiesler and Sproull 1992, for a review). In a GDSS setting, a decision room contains a number of personal computers, interconnected via a local area network, and large screen monitors which can display either combined responses or individual members' inputs. GDSS include voting or consensus-arriving techniques (i.e., brainstorming, Delphi, and nominal group techniques) that allow the group members to reach decisions based on a review of each member's input, notations and explanations (DeSanctis and Gallupe 1987). Because GDSS allow multiple users to access the common work space from different locations, either simultaneously or at different times, it overcomes locational and time differences. Decision makers with specialized software can aggregate, sort and manage information in more structured ways. Also, each step in the decision making process can be documented by utilizing the storage capacity of computer memory.

Researchers are concerned with how group decisions can be made more efficient and fair through removing sources of biases, such as status, gender and personal charisma. Table 1 presents a summary of findings of relevant group studies which shows that GDSS provide a more equal opportunity of participation and enhance the thoroughness of communication. Also, because the participants in the GDSS group may be anonymous, the groups are not "swayed" by the status or gender of their members and, therefore, the domination by influential members is reduced. Further, previous studies show that participants' confidence level, satisfaction and perceived agreement with the group decision processes should improve with the use of GDSS (e.g., Jarvenpaa, Rao, and Huber 1988, McLeod 1992).

Group decision theory suggests that full and equal participation is more likely to result in higher quality group decisions (Zander 1982). Also, since GDSS adds structure to the task, GDSS groups may experience fewer diversions and distractions, and this more focused attention may increase the quality of the group decisions (Jessup, Connolly and Tansik 1990). However, while some studies support the suggestion that GDSS will increase group decision quality (Gallupe, DeSanctis and Dickson 1988, Zigurs, Poole and DeSanctis 1988, Jarvenpaa, Rao and Huber 1988), it should be noted that other studies reported no difference in decision quality between GDSS groups and Non-GDSS groups (Ruble 1984, Easton 1988, George, Easton, Nunamaker and Northcraft 1990).

Table 1. Summary of relevant group studies

Study reference	Summary of findings
Alker (1963)	In face-to-face communication modes, group members display unequal willingness to participate
Strodbeck and Lipinski (1985)	The higher-status people talk more than the lower-status people
McGuire et al. (1987)	Male executives in face-to-face groups were five times more likely than female executives to make the first decision proposal. Also, women executives in the GDSS group make the first proposal as often as men.
Sage (1990)	GDSS can reduce the cognitive load associated with group meetings, which eases the potential for overload that is inherent in unassisted group decision making.
Dubrovsky, Kiesler and Sethna (1991)	High-status members tended to dominate face-to-face communications regardless of whether or not they had better knowledge on the topic under discussion
Kiesler and Sproull (1992)	The high-status people in the GDSS group do not dominate as much as their counterparts in the face-to-face group

In most audit contexts, the lack of a well-specified criterion event makes the evaluation of audit decisions difficult. Regulators and the courts have often regarded consensus as a surrogate for decision quality (Libby and Lewis 1982). Thus, audit judgment researchers and practitioners often rely on consensus as a surrogate measure of audit decision accuracy (Solomon and Shields 1995). Since the going-concern judgment is relatively unstructured and information-intensive, auditors may benefit from the use of a GDSS (e.g., full and equal participation; significant amount of information exchange) that could help them reach consensus on going-concern judgments.

H3: Auditors in GDSS groups reach higher levels of consensus on going-concern judgments than are reached among auditors in Non-GDSS groups.

H4: Auditors in GDSS groups have greater confidence in their groups' going-concern judgments than do their Non-GDSS counterparts.

Research design

Subjects

In practice, experienced auditors (managers and partners) are responsible for going-concern judgments. However, after about three to four years of audit training and experience, an auditor begins to assume partial responsibility (as a supervising senior) for going-concern evaluations (especially since going-concern evaluations are now required for all audit clients).

At this point in their careers, auditors have strong personal incentives to add to their knowledge and to become fully informed with regard to the going-concern evaluation process. A total of 42 partners, managers and supervising seniors from four multinational public accounting firms participated in the experiment. Each group consisted of three participants, including at least one partner and one manager.[1] A total of 14 groups was used (seven groups per treatment). The auditors indicated a mean (median) of 109 (96) months of audit experience and a mean (median) of 79 (65) months of loan experience. Each group was randomly assigned to function as either a GDSS group or a Non-GDSS group.

Prior research (Trotman, Yetton and Zimmer 1983, Ashton and Ashton 1985) has determined that groups of three are sufficiently large to obtain the benefits of multiperson decision making and that they approximate the size of a normal audit team. Using a group size of three also minimizes the number of experimental subjects required. While GDSS may be more dramatic in larger size groups (Nunamaker et al. 1991), Gallupe, DeSanctis and Dickson (1988), in a management information system context, demonstrated that the impacts of GDSS could be detected in three-person groups.[2] In addition, DeSanctis and Poole (1988) reported no differences in most of the dependent variables between three- and four-person groups. The group size of three used in this study yields a total of 14 groups (7 groups for each treatment) and, thus, results in sufficient degrees of freedom for a statistical analysis of the data (see Gallupe, DeSanctis and Dickson 1988). Using established groups for this study eliminates concern about a lack of external validity due to the use of ad hoc groups.

Task

The "American Computers" case designed by Wright (1991) was used in this study.[3] Subjects were provided with a detailed narrative on American Computer's business, management and history, complete income, balance sheet, cash flow statements, and a listing of financial ratios. The case was designed to suggest a questionable going-concern status. In order for auditors to focus on American's financial viability, both a going-concern judgment and a loan collectibility assessment were obtained (see Appendix A). The going-concern question was, "Given the information you have reviewed, what is your evaluation of American's ability to *continue as a going concern* between August 1, 1988, and October 1, 1989?" (italics in the original). The response scale for the going-concern judgment ranged from 1 (very weak) to 7 (very strong).

In addition, auditors were asked, before reaching their going-concern judgments, to make three judgments of the client's financial dimensions (profitability, short-term liquidity and long-term liquidity) and three trend judgments for these same financial dimensions over the previous three years. The response scale for these intermediate judgments ranged from "very weak" to "very strong".

Experimental procedures

The study is a between-subjects design (GDSS vs. Non-GDSS). For the GDSS groups, a decision room with computer terminals on the desks was set up at The University of

California at Irvine. Participants in the GDSS group came to the decision room to take part in this study. Each computer terminal was set up so that all participants could see the other group members and the public screen. The GDSS group members used computer terminals to support group decision making. A large public screen was used. For the various decisions to be made, *GroupSystem*, a standard commercial GDSS software, was used to perform the basic functions of recording, storing and displaying comments that were entered by group members, including aggregating and categorizing comments and recording anonymous votes (e.g., Nunamaker, Dennis, Valacich and Vogel, 1991). For the Non-GDSS groups, the researcher went to their office conference rooms to administer the experiment.

The experimental procedures are summarized in Figure 1. As shown in Figure 1, all participants in both the "GDSS" or the "Non-GDSS" groups were asked to read and analyze the case and then to provide their individual answers to questions regarding a client's financial dimensions (profitability, short-term liquidity and long-term liquidity), going-concern status, and their confidence in the individual going-concern judgments. After the session in which individual judgments were made, the facilitator in the GDSS groups and

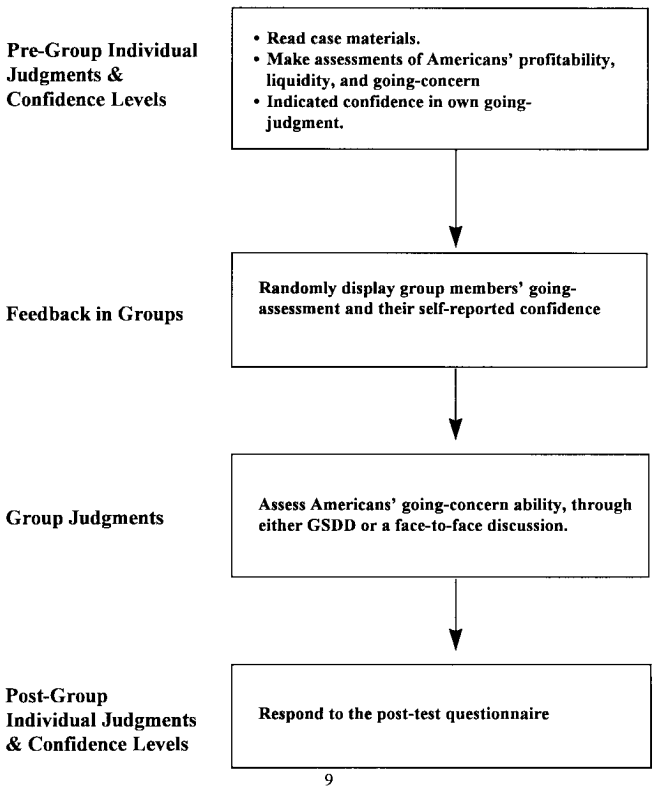

Figure 1. Summary of experimental procedures.

the researcher in the Non-GDSS groups randomly displayed group members' going-concern assessments and their confidence levels associated with the assessments. With this feedback, participants were asked to discuss the case either through the electronic brainstorming session (GDSS group) or in a face-to-face discussion (Non-GDSS group). This placed some structure on the decision-making session but still allowed free-flowing discussion via software. For GDSS groups, the facilitator gave a brief description of how to use the GDSS at the beginning of each group session, and let participants practice a few minutes. Participants subsequently were instructed first to use electronic brainstorming followed by voting sessions to facilitate group discussion, and to vote on a seven-point Likert scale their unitary group going-concern assessment. This process continued until a consensus on the going-concern judgment was reached. Verbal discussions were not allowed in the GDSS groups. In contrast to the GDSS group, auditors in the Non-GDSS groups reached their final group judgment of American's ability to continue as a going-concern through face-to-face discussion. Each auditor was then asked to report both his/her confidence in the group's final going-concern judgment.

After the discussion sessions, all groups (both GDSS and Non-GDSS) were disbanded, and the individual participants were asked to fill out, individually, a post-test questionnaire reporting their satisfaction with the process and whether they agreed with their group's final judgment. Their satisfaction and agreement were measured using seven-point Likert scales. Some debriefing questions were also asked to determine if the group members had questions, comments, or suggestions regarding any of the decision-making sessions. Overall, the auditors considered the description of American Computers to be very realistic (the mean is 5.99 out of 7). There was no time limit for any of the groups to complete the task.

Dependent variables

The dependent variables were the going-concern judgments of individual auditors, as well as the conclusions of audit groups. Auditors' consensus on the going-concern judgment was measured by the dispersion of the going-concern judgment (i.e., standard deviations, ranges, and interquartile ranges). Group members' self-reported ratings of confidence in the group's decision, their individually reported degrees of agreement with the group's final judgment and of satisfaction with the group decision-making process were also examined.

Results

Going-concern judgments

The American Computers case was designed to suggest an uncertain going-concern status; this was confirmed by 42 experienced auditors who participated in the experiment (the mean for individual going-concern judgments is 3.43 on a scale of 1 to 7). Table 2 presents descriptive statistics for the pre-group going-concern judgments. The mean going-concern judgment for the 21 individual auditors in the GDSS groups is 3.36 and the mean for the 21 individual auditors in the Non-GDSS groups is 3.50; these means are not statistically

different ($F(1,40) = 0.09$, $p < 0.77$), indicating that the pre-group individual judgments were very similar.

Recall that the auditors, after participating in either an "electronic brainstorming" or a "face-to-face" discussion session, were asked to vote on American Computer's status as a going concern. The mean judgment of the going-concern status of American Computers for the fourteen groups is 3.07, which is lower than the average for individual pre-group going-concern judgments (3.43). It appears that, in the group discussion, the auditors have placed more weight on the negative cues and have been less optimistic about American's going-concern status. Further examination shows that the changes in their going-concern judgments were due mainly to the electronic brainstorming discussion. For example, anonymous and lengthy group discussion lowered the GDSS group's mean going-concern rating to 2.71 (see Table 2). However, face-to-face group discussion in the Non-GDSS groups had no significant effect on group going-concern judgments, which had a mean of 3.43. Nevertheless, weak statistical power may account for the difference between the mean going-concern judgments of GDSS groups and those of Non-GDSS groups, 2.71 vs. 3.43 not being statistically significant ($F(1, 12) = 1.12$, $p , 0.31$).

After the group discussion, auditors again were asked to make their own going-concern judgment. The overall mean post-group going-concern judgment by 42 individual auditors is 3. 11, which differ marginally from their pre-group individual judgment ($t = 1.73$, $df = 41$, $p < 0.092$). Also, an ANOVA was conducted with the individual post-group going-concern judgments as the dependent variable and the individual pre-group going-concern judgments as a covariate. The results show that the post-group going-concern judgments of the 42 individuals were influenced significantly by their pre-group going-concern judgments ($F(1, 39) = 24.113$, $p < 0.0001$). Both pre-group and post-group going-concern judgments are displayed graphically in Figure 2.

Further, individual post-group going-concern judgments were affected by which group structure they had experienced ($F(1, 39) = 3.188$, $p < 0.08$). The effects of the two communication modes on individual judgments can be examined by comparing mean post-group individual going-concern judgments. As Table 2 shows, the mean of individual post-group going-concern judgments for the 21 individual auditors in GDSS groups is 2.81, while the mean of individual judgments by the 21 individual auditors in Non-GDSS groups is 3.40 ($F(1, 40) = F = 2.5856$, $P = < 0.12$). To further understand the effect of different group discussions, individual auditors' pre-group and post-group going-concern judgments were compared. The comparison provides weak support for the use of the GDSS structure; that is, the 21 individual auditors' post-group going-concern judgments (2.81) differed from their pre-group going-concern judgments (3.36) ($t = 1.80$, $df = 20$, $p < 0.087$). There is no significant difference between the individual pre-group and post-group going concern judgments of the 21 auditors in the Non-GDSS group (3.50 vs. 3.40; $t = 0.45$, $df = 20$, $p < 0.658$).

Consensus of going-concern judgments

There is considerable variance in the going-concern judgments. Table 2 shows that the pre-group going-concern judgments for all 42 auditors range from 1.0 to 6.0, with a

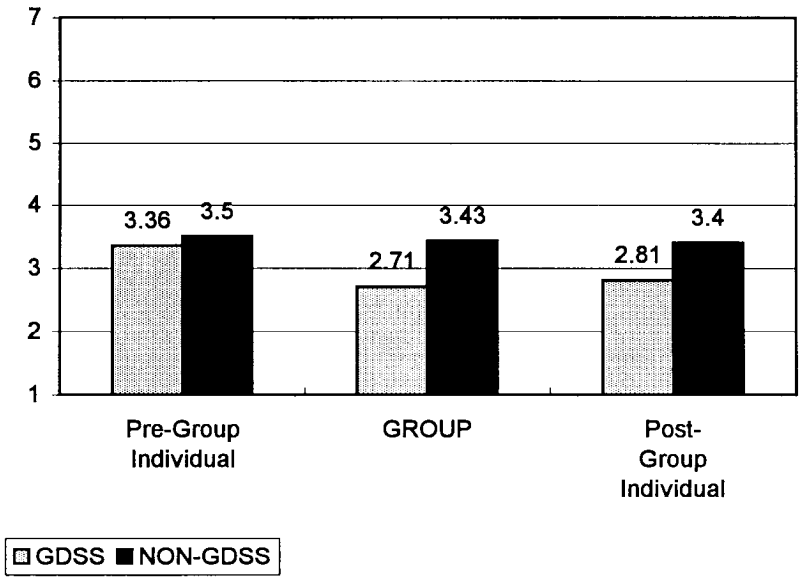

Figure 2. Going-concern judgments.

standard deviation of 1.48. The interquartile ranges also indicate substantial disagreement (i.e., (2.0, 4.2)). For the 21 individual auditors in GDSS groups, the standard deviation of the going-concern judgments is 1.62, ranging from 1.0 to 6.0. Similarly, for the 21 individual auditors in Non-GDSS groups, the standard deviation of the going-concern judgments is 1.36 with a range from 1.5 to 6.0. This considerable dispersion appears at all levels of the audit experience; that is, the correlation between the going-concern judgments and months of audit experience is not significant ($r = 0.005$, $p < 0.20$).

Surprisingly, after group discussions, neither the range nor the standard deviation of individual going-concern judgments decreased significantly (see Table 2). The standard deviations for the 42 individual auditors' going-concern judgments is 1.22, with a range of 1.0 to 6.0. The interquartile ranges of the individual post-group judgments (2.0 to 4.0) are similar to those of the individual pre-group judgments. The dispersion of individual auditors' going-concern judgments is similar for both GDSS and Non-GDSS groups. For example, for GDSS groups, the range of 21 individual auditors' going-concern judgments is from 1.0 to 5.0, with a standard deviation of 1.28. For 21 individual auditors in Non-GDSS groups, the standard deviation of the going-concern judgment is 1.11, ranging from 1.5 to 6.0. These results do not support H1, which states that group discussions affect auditors' going-concern judgments and lead them to reach higher levels of consensus.

When compared with individual going-concern judgments, the variance within the groups' going-concern judgments decreases. The standard deviation of the going-concern

Table 2. Descriptive statistics for going-concern judgments

	GDSS	Non-GDSS	Overall
Pre-group			
Individuals' *Going-concern Judgments*			
Mean	3.36	3.50	3.43
Standard deviation	1.62	1.36	1.48
Range	1.0–6.0	1.5–6.0	1.0–6.0
Individuals'Confidence in own Going-concern Judgment			
Mean	4.12	4.07	4.10
Standard deviation	1.37	1.11	1.23
Sample size (n)	21	21	42
Group			
Going-concern Judgment			
Mean	2.71	3.43	3.07
Standard deviation	1.38	1.13	1.27
Range	1.0–4.0	2.0–5.0	1.0–5.0
Sample size (n)	7	7	14
Individuals'Confidence on Group Going-concern Judgment			
Mean	5.40	4.24	4.82
Standard deviation	0.74	1.24	1.17
Sample size (n)	21	21	42
Post-Group			
Individuals' Going-concern Judgments			
Mean	2.81	3.40	3.11
Standard deviation	1.28	1.11	1.22
Range	1.0–5.0	1.5–6.0	1.0–6.0
Sample size (n)	21	21	42

judgments for the fourteen groups is 1.27, which is not much lower than the standard deviation of individual going-concern judgments (1.48). Furthermore, the range of group going-concern judgments is still wide (from 1 to 5). More specifically, the going-concern judgments for the seven GDSS groups range from 1 to 4, with a standard deviation of 1.38, while the standard deviation of the going-concern judgment of the seven Non-GDSS group is 1.13, ranging from 2 to 5. The results do not support H3 that GDSS groups reach higher levels of consensus than Non-GDSS groups.

Confidence in going-concern judgments

As shown in Table 2, all 42 individual auditors indicated moderate levels of confidence in their individual going-concern judgments (mean (standard deviation) of 4.10 (1.23)). The confidence level of the 21 individual GDSS auditors was similar to that of the 21 individual Non-GDSS auditors (4.12 vs. 4.07), and the difference is insignificant ($F(1, 40) = 0.19$, $p < 0.89$).

After each group had made its final going-concern assessment, individual members were asked to report their personal confidence in the group's judgment. The auditors in GDSS groups had stronger confidence in their group's going-concern judgment (5.40) than did their non-GDSS counterparts (4.24), this difference being statistically significant ($F(1, 40) = 13.74$, $p < 0.0006$) and substantial in magnitude. This result supports H4 that auditors in GDSS groups have greater confidence in their group's conclusion than do auditors in Non-GDSS groups.

Also, as shown in Table 2, the effect of group discussion on individual auditors' confidence in going-concern judgments is more apparent in the anonymous electronic group discussion (4.12 before the discussion, 5.40 after the discussion), the difference being statistically significant ($t = 4.24$, $df = 20$, $p < 0.0001$). Interestingly, 21 individual auditors in the Non-GDSS groups did not express more confidence in the final going-concern judgment their group reached after face-to-face discussion (4.24 vs. 4.07) ($t = 0.51$, $df = 20$, $p < 0.62$). Moreover, the changes in the confidence levels of individual auditors in GDSS groups in their own going-concern judgments are significantly different from those of auditors in non-GDSS groups ($F(1, 40) = 6.28$, $p < 0.02$).

Paired sample *t*-tests show a significant difference between 42 auditors' pre-group confidence in individual going-concern judgments (4. 10) and their post-group confidence in group's going-concern judgments (4.82) ($t = 3.06$, $df = 41$, $p < 0.004$). These results support H2, which states group discussions lead auditors to experience greater confidence in their group's going-concern judgment. Pre-group and post-group individual auditors' mean levels of confidence in going-concern judgments are presented in Figure 3.

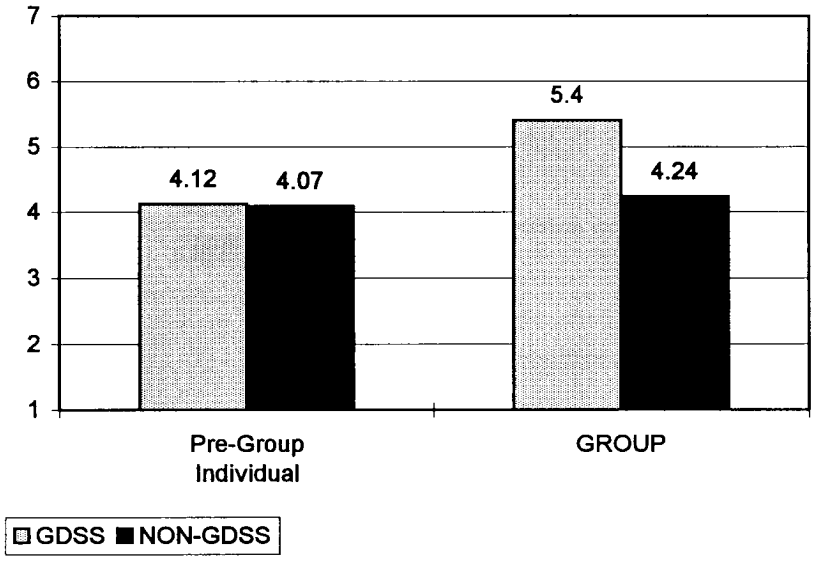

Figure 3. Confidence in going-concern judgments.

Others

In the debriefing session, individual auditors were asked to indicate their own level of satisfaction with the group decision process. As shown in Table 3, the member satisfaction level in the GDSS groups (5.53) was much higher than in the Non-GDSS groups (4.68), the difference being statistically significant ($F(1, 40) = 6.98$, $p < 0.01$). Also, as expected, the agreement with the group's conclusion in the GDSS groups (6.06) was much higher than in the Non-GDSS groups (4.68), the difference being statistically significant ($F(1, 40) = 18.39$, $p < 0.0001$). Decision quality is affected by the length of time decision makers spent in reaching decisions (McLeod 1992). Although Siegel et al. (1986) reported that GDSS groups took four times longer to make a decision than did face-to-face groups, the GDSS groups in this study spent only 12 minutes more than their Non-GDSS counterparts (64 minutes vs. 52 minutes) to complete the task. This difference is, however, statistically significant ($F(1, 12) = 12.88$, $p < 0.004$).

Summary and discussion

Previous studies have shown considerable disagreement among more experienced auditors and that increased audit experience results in significantly more positive going-concern judgments but does not improve judgment consensus. This study examined the effect of group decision processes and technology on auditors' going-concern judgment. The results showed that group discussion processes led auditors to consider factors they might have overlooked in an individual decision context and to also be more conservative. Thus, they reached more negative going-concern judgments. The effect of group discussion on auditors' going-concern judgments was particularly evident when they used the GDSS as the structure for group discussion. The GDSS appears to help auditors focus more directly on the task. However, neither discussion structure (GDSS vs. face-to-face) significantly reduced the considerable disagreement among experienced auditors' going-concern judgments. This finding conflicts with a finding by Cydupe, DeSanctis and Dickson (1988)

Table 3. Descriptive statistics for group members' perceptions

	GDSS	Non-GDSS	Overall
Satisfaction with Group process			
Mean	5.53	4.68	5.10
Standard deviation	0.90	1.16	1.11
Agreement with the Group judgment			
Mean	6.06	4.68	5.37
Standard deviation	0.96	1.13	1.25
Completion time			
Mean	63.71	51.86	57.79
Standard deviation	6.70	5.61	8.55

that GDSS was useful in a difficult case. One possible explanation is that going-concern judgments are relatively unstructured tasks, thus they require the consideration and integration of substantial amounts of information.

In implementing a group decision support system auditing firms need to recognize and manage the political dimension of the effort (Weiss and Birnbaum 1989). The findings of this study suggest that once an auditing firm has tested the use of a GDSS to facilitate group decisions, implementation of such a system on a more permanent basis will not meet with auditor resistance. For example, participants using the GDSS indicated a higher level of satisfaction than did participants in the traditional face-to-face groups. This result may be attributed to GDSS' ability to remove communication barriers and to provide auditors an equal opportunity to participate. Reported levels of perceived agreement with the group decision process are significantly higher for the GDSS groups than for the Non-GDSS groups. Group discussions, in general, resulted in higher level of confidence in the group's final going-concern judgments, but auditors in the GDSS groups were more confident in their going-concern evaluations than were their counterparts in the Non-GDSS groups.

The results of this study also suggest that GDSS facilitate auditors' consideration of a broader set of information which is important in the course of an audit. Although GDSS have received increasing attention in the management and management information system domains, their application is still in its infancy in accounting and auditing. The results of this study raise several questions related to the use of GDSS in auditing, and the issues can be viewed as avenues for future research. First, DeSanctis and Poole (1994) pointed out that technology properties and contextual contingencies play important roles in the outcomes of advanced information technology use. Given that a GDSS does not significantly improve consensus of going-concern judgments, is this due to the context used, and how can this finding be generalized to other going-concern judgments? Can the benefit of using GDSS be gained in other unstructured audit tasks (e.g., evaluating the acceptability of a new audit client)? Future research should identify the tasks to which technology can bring improvements in work efficiency and effectiveness.

Second, going-concern evaluations are relatively unstructured and quite cognitively complex. If the lack of consensus reported here characterizes judgments being made in the field by experienced auditors, in general, then serious questions arise concerning the effectiveness of going-concern judgments and how to support auditors in making better going-concern judgments. Prior research suggests that decision makers' inconsistencies in judgment are due to the process of combining cues, not to the process of identifying cues (Einhorn 1972). Future research should investigate which explicit models (e.g., linear judgment models or knowledge-based systems) can improve going-concern evaluations.

Finally, in this study, auditors showed very positive attitudes (e.g., more satisfaction, more agreement with the other group members and higher confidence) toward the group decision process when using the GDSS. Furthermore, in the researcher's post-experiment interviews, the lower-ranked practicing auditors, in particular, favored the use of GDSS. Based on this finding, future studies should investigate the importance of auditors' confidence levels about their overall performance and in the effectiveness and efficiency of the audit.

Notes

1. Some groups had two partners, while others had two managers.
2. Note that Gallupe, DeSanctis and Dickson (1988) used philosophically different GDSS software than the *GroupSystems* software used in this experiment.
3. The original case was designed by Wright (Wright 1991) to investigate the effect of presentation format (i.e., tabular vs. tabular + graphics). That case was revised to meet the purposes of the current study.

References

Abdolmohammadi, M., and A. Wright. (1987). "An Examination of the Effects of Experience and Task Complexity on Audit Judgments," *The Accounting Review* 62, 1–13.

Alker, H.R. (1996). *Mathematics and Politics*. New York: Macmillan.

American Institute of Certified Public Accountants (1988). SAS 59: *The Auditor's Consideration of an Entity's Ability to Continue as a Going Concern*.

Asare, S.K. (1990). "The Auditor's Going-Concern Decision: A Review and Implications for Future Research. *Journal of Accounting Literature* 9, 39–64.

Ashton, A.H. and R.H. Ashton. (1985). "Aggregating Subjective Forecasts: Some Empirical Results," *Management Science* 31(12), 1499–1508.

Benbasat, I. and L.H. Lini. (1993). "The Effects of Group, Task, Context, and Technology Variables on the Usefulness of Group Support Systems: A Meta-analysis of Experimental Studies." *Small Group Research*, 24(4), 430–462.

Campisi, S. and K.T. Trotman. (1985). "Auditor Consensus in Going Concern Judgments." *Accounting and Business Research*, 15, 303–310.

Chalos, P. (1985). "Financial Distress: A Comparative Study of Individual, Model, and Committee Assessments." *Journal of Accounting Research*, Autumn 23(2), 527–543.

Chow, C.W., A.H. McNamee and R.D. Plumlee. (1987). "Practitioners' Perceptions of Audit Step Difficulty and Criticalness: Implications for Audit Research," *Auditing: A Journal of Practice & Theory*, 6 (Spring), 123–133.

DeSanctis, G. and M.S. Poole. (1994). "Capturing the Complexity in Advanced Technology Use: Adaptive Structuration Theory." *Organization Science*, forthcoming.

DeSanctis, G. and R.B. Gallupe. (1987). "A Foundation for the Study of Group Decision Support Systems." *Management Science*, 33, 589–609.

Dubrovsky, V., S. Yiesler and B. Sethna. (1991). "The Equalization Phenomenon: Status Effects in Computer-mediated and Face-to-Face Decision Making Groups." *Human Computer Interaction*, 6, 119–146.

Easton, A. (1988). "An Experimental Investigation of Automated Versus Manual Support for Stakeholder Identification and Assumption Surfacing in Small Groups." Unpublished doctoral dissertation, University of Arizona.

Einhom, H.J., R.M. Hogarth and E. Klempner. (1977). "Quality of Group Judgment." Psychological Bulletin, 84(1), 158–172.

Einhom, H.J. (1972). "Expert Measurement and Mechanical Combination." *Organizational Behavior and Human Performance*, 7, 86–106.

Gallupe, R.B., G. DeSanctis and G.W. Dickson. (1988). "Computer-based Support for Group Problem Finding: An Experimental Investigation." *MIS Quarterly*, 12(2), 277–296.

George, J.F., G.K. Easton, J.F. Nunamaker Jr. and G.B. Northcraft. (1990). "A Study of Collaborative Group Work With and Without Computer-based Support." Working paper, University of Arizona.

Ho, J. (1994). "The Effect of Experience on Consensus of Going-concern Judgments." *Behavioral Research in Accounting*, 6, 160–177.

Jarvenpaa, S.L., V.S. Rao and G.P. Huber. (1988). "Computer Support for Meetings of Groups Working on Unstructured Problems: A Field Experiment." *MIS Quarterly*, 12(4), 645–665.

Jessup, L.M., T. Connolly and D.A. Tansik. (1990). "Toward a Theory of Automated Group Work: The Deindividuating Egects of Anonymity." *Small Group Research*, 21(3), 333–348.
Jessup, L.M. and J. Valacich. (1992). *Group Support Systems: New Perspectives*. New York: Macmillan.
Kida, T. (1980). "An Investigation into Auditors' Continuity and Related Qualification Judgments." *Journal of Accounting Research*, 18, 506–523.
Kiesler, S. and L. Sproull. (1992). "Group Decision Making and Communication Technology." *Organizational Behavior and Human Decision Processes*, 52, 96–123.
Kraemer, K.L. and A. Pinsonneault. (1989). "The Impact of Technological Support on Groups: An Assessment of the Empirical Research." *Decision Support Systems*, 5(2), 197–216.
Libby, R. and B.L. Lewis. (1982). "Human Information Processing Research in Accounting." *Accounting, Organizations and Society*, 7, 231–285.
Libby, R., K.T. Trotman and I. Zimmer. (1987). "Member Variation, Recognition of Expertise, and Group Performance." *Journal of Applied Psychology*, 72(1), 81–87.
Markus, M.L. and D. Robey. (1988). "Information Technology and Organizational Change: Causal Structure in Theory and Research." *Management Science*, 34, 583–598.
McGuire, T., S.J. Kiesler and J. Siegel. (1987). "Group and Computer-mediated Discussion Effects in Risk Decision Making." *Journal of Personality and Social Psychology*, 52, 917–930.
McLeod, P.L. (1992). "An Assessment of the Experimental Literature on Electronic Support of Group Work: Results of a Meta-analysis." *Human-Computer Interaction*, 7, 257–280.
Messier, W.F. (1995). "Research in and Development of Audit Decisions Aids." In Ashton & Ashton (Ed.), *Judgment and Decision-making Research in Accounting and Auditing* (pp. 207–228). Cambridge: University Press.
Nunamaker, J.F. Jr., L.M. Applegate and B. Konsynski. (1987). "Facilitating Group Creativity: Experience with a Group Decision Support System." In *Proceedings of the Twentieth Annual Hawaii International Conference on System Sciences* 1, 422–430.
Nunamaker, J.F. Jr., A.R. Dennis, J.S. Valacich and D.R. Vogel. (1991). "Inforfnation Technology for Negotiating Groups: Generating Options for Mutual Gain." *Management Science*, 37, 1325–1346.
Ruble, M.R. (1984). "An Empirical Test of a Decision Support System in a Group Decision Making Environment." Unpublished doctoral dissertation, Arizona State University.
Sage, A.P. (1990). "Group Decision Support Systems." In Sage (Ed.), *Concise Encyclopedia of Information Processing in Systems and Organizations*. New York: Pergamon Press.
Siegel, J., V. Dubrovsky, S. Kiesler and T. McGuire. (1986). "Group Processes in Computermediated Communication." *Organizational Behavior and Human Information Processes*, 37, 157–187.
Solomon, I. and M.D. Shields. (1995). "Judgment and Decision-making Research in Auditing." In Ashton and Ashton (Ed.), *Judgment and Decision-making Research in Accounting and Auditing* (pp. 137–175). Cambridge: University Press.
Strodbeck, F.L. and R.M. Lipinski. (1985). "Becoming First Among Equals: Moral Considerations in Jury Foreman Selection." *Journal of Personality and Social Psychology*, 49, 927–936.
Trotman, K.T., P.W. Yetton. and I.R. Zimmer. (1983). "Individual and Group Judgments of Internal Control Systems." *Journal of Accounting Research*, 21, 286–292.
Wright, W.F. (1991). "Improvement of Financial Judgments Given Graphical Displays." Unpublished working paper, Graduate School of Management, University of California, Irvine, June.
Zander, A. (1982). *Making Groups Effective*. San Francisco, CA: Jossey-Bass.
Zigurs, I., M.S. Poole and G.L. DeSanctis. (1988). "A Study of Influence in Computer-mediated Group Decision Making." *MIS Quarterly*, 12(4), 625–644.

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Appendix A: The Judgments Provided

A. The intermediate conclusions:

1. What is your evaluation of the expected profitability of American over the future 24 month period starting on August 1 1988, relative to other firms in the microcomputer industry?

2. What is your evaluation of the trend in the profitability of American over the previous 3 years ending in mid-1988, relative to other companies in the microcomputer industry?

3. What is your evaluation of the current liquidity position of American Computers as of early August 1988, relative to other companies in the microcomputer industry?

4. What is your evaluation of what the current liquidity position of American Computers will be as of October 1, 1989?

5. What is your evaluation of the trend in the current liquidity of American over the previous 3 years ending in mid-1988 compared to other companies in the microcomputer industry?

6. What is your evaluation of the present long-term liquidity position of American, relative to other companies in the microcomputer industry?

7. What is your evaluation of the trend in the long-term liquidity position of American over the previous 3 years ending in mid-1988 compared to other companies in the microcomputer industry?

B. The going concern judgment:

8. Given the information you have reviewed, what is your evaluation of Arnerican's ability to *continue as a going-concern* between August 1 1988, and October 1 1989?"

9. Given the information you have reviewed, what is your level of confidence in the going concern decision you made in question # 8?

Response scale for all of the above questions:

very weak	weak	less than aver.	average	higher than aver.	strong	very strong

C. Post-test Questions

10. How satisfied you were with the group decision-making process?

11. What is your assessment of your degree of agreement with the group's final judgment of American's going concern abflity?

Very unsatisfied (highly disagreed)						very satisfied (highly agreed)