EXECUTIVE SUMMARY

BOND RATINGS IN CYBERSPACE: A STUDY OF THE FEASIBILITY OF COMPUTER-SUPPORTED RATING COMMITTEES AT STANDARD & POOR'S RATINGS GROUP

by

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Standard & Poor's Ratings Group, the world's leading bond rating agency, serves the world's capital markets by assigning ratings that describe the credit quality of a wide range of debt and debt-like securities. S&P ratings help investors in determining the ability of a debt issuer to repay principal and interest according to the terms of the securities to which the ratings are assigned.

Since the mid-1970s, S&P has assigned these ratings through a rating committee process. A committee of analysts with expertise in the type of debt and the industry of the issuer meets and discusses financial, operating, and competitive issues relevant to the particular debt issue, and votes on the rating to be assigned. Increasingly, this process--like the world's capital markets--has become globalized, with S&P analysts around the world participating in these meetings via telephone with their colleagues from New York, S&P's headquarters city.

Collaborative computer technology would offer S&P analysts the ability to conduct bond rating meetings "in cyberspace;" i.e., in an asynchronous mode that would not require analysts to be physically present at

a specific time and/or place to participate in the rating discussion. To determine the feasibility of implementing such an approach, the present study examined the research to date into the effectiveness of computer-mediated group decision support applications, and a research instrument was designed and administered to a stratified random sample of 149 S&P bond analysts to ascertain their attitudes toward the use of computers in the rating process. Eighty-three analysts responded to the survey, a 56% response rate.

This report summarizes the findings of the research, and offers some recommendations for approaches that could be taken to enhance analysts' familiarity with computers and group decision support systems so that they may become more comfortable with a future implementation of such systems at S&P.

Research Questions

The study sought the answers to the following questions:

1. Is the present rating committee structure adequately to meet S&P's needs into the future?

2. Can technology play a greater role in creating "virtual rating committees" where the members meet and decide ratings in an asynchronous way?
3. How much of a factor in the rating process--either positive or negative--is the direct personal interaction that takes place during a committee meeting?
4. What are the attitudinal issues of bond analysts with respect to technology that would need to be addressed in order for "virtual rating committees" to succeed? What level of computer skills do analysts have?
5. Do these attitudes vary demographically; i.e., by rating department, level of analytical experience, level of computer knowledge, educational level?

To help answer these questions, a series of null/alternate hypotheses were proposed as follows:

Hypotheses

1. Receptivity of high-computer skill analysts to virtual rating committees: It was expected that

even analysts with high levels of computer literacy would not be receptive to introducing a virtual rating committee option. Therefore, the null hypothesis (1) may be stated as:

$H_0(1)$: Analysts with high levels of computer literacy will not be more receptive to virtual rating committees.

The alternative hypothesis then becomes:

$H_a(1)$: Analysts with high levels of computer literacy will be more receptive to the concept of virtual rating committees.

2. Receptivity of low-computer skill analysts to virtual rating committees: It was expected that analysts with low computer literacy would not be receptive to the concept of virtual rating committees. The null and alternate are given by:

$H_0(2)$: Analysts with lower levels of computer literacy will regard the present rating committee structure as more desirable.

$H_a(2)$: Analysts with lower levels of computer literacy will not regard the present rating committee structure as more desirable.

3. Importance of interpersonal communication to

junior and senior analysts: It was expected that junior and senior analysts would regard the interpersonal communication at rating committee meetings to be important to the rating decision.

3a. Senior analysts. The null and alternate hypotheses are given by:

H_0(3a): Interpersonal communications that take place at face-to-face committee meetings are regarded as crucial to the rating decision by senior analysts.

H_a(3): Senior analysts do not regard interpersonal communications at face-to-face committee meetings to be crucial to the rating decision.

3b. Junior analysts. The null and alternate hypotheses are given by:

H_0(3b): Interpersonal communications that take place at face-to-face committee meetings are regarded as crucial to the rating decision by junior analysts.

H_a(3b): Junior analysts do not regard interpersonal communications at face-to-face committee meetings to be crucial to the rating decision.

4. Willingness to time-shift work, senior and junior analysts: It was anticipated that the senior analysts would not be willing to time-shift their work

burdens even if the virtual rating committee approach made their schedules more manageable.

4a. Senior analysts. The null and alternate are:

H_0(4a): Senior analysts will be unwilling to shift some of the work burden to their time away from the office, even if virtual rating committees were to free them from late evening or early morning meetings.

H_a(4): Senior analysts will be willing to shift some of the work burden to their time away from the office by using the virtual rating committee system.

4b. Junior analysts. The null and alternate hypotheses are:

H_0(4b): Junior analysts will be more willing to timeshift their work if it means attending fewer meetings at irregular hours.

H_a(4b): Junior analysts will be less willing to timeshift their work.

5. Influence factor: It was expected that junior analysts would indicate that they were influenced by the opinions of senior analysts at rating committee meetings. The null and alternate are:

H_0(5): Junior analysts are influenced by the opinions of senior analysts at rating committee

meetings.

$H_a(5)$: Junior analysts are not influenced by the opinions of senior analysts at rating committee meetings.

The results of the survey were tabulated and groups of responses were analyzed using the one-way Analysis of Variance (ANOVA) statistical test to determine if there were significant differences in analysts' attitudes because of either their level of seniority at S&P or their computer literacy. The ANOVA analysis was used to provide a statistical foundation to accepting or rejecting the null hypotheses.

Results

The study found statistically significant differences ($p < .05$) in the attitudes of junior and senior analysts regarding the ability of computers to enhance the quality of the bond rating, and in the beliefs of analysts with high vs. low computer literacy about whether the rating committee is the best way to arrive at a rating decision. However, there were no statistically significant differences found in the

responses to questions designed to measure analysts' attitudes toward asynchronous rating committee meetings.

This does not mean that the concept of computer-mediated meetings could never work at S&P. This finding does suggest that there is more work to be done in educating the S&P analytical population about the range of roles that computers might play in a bond rating process of the future. It is possible that a properly educated population would exhibit more receptivity to additional computerization, even virtual rating committees, if properly presented, explained, and even demonstrated to them.

The results of the study led to recommendations for a multiphase program of education/demonstration, prototyping, and implementation for groupware at S&P, with each phase to include additional attitudinal research to gauge whether analysts' attitudes vary if they are provided with more information, education, and behavior change inducements regarding the advantages of groupware.

Conclusions of Data Analysis and Literature Review

The data collected in the present study confirm the findings of previous researchers into computer support for collaborative work, particularly Lewenstein (1992) and Loperfido (1993), who concluded that the introduction into a project team or work group of a collaborative technology--electronic mail, in both instances--does not appreciably change the way the group thinks about the technology. The paradigm groupware studies at MIT (Halperin, 1993; Orlikowski, 1992) have indicated that introduction of an advanced computer technology without first preparing the corporate culture to receive it, through modifications to the reward and incentive systems and through education of the staff as to its value and utility, will fail to achieve the radical changes desired in the way the firm works.

Despite some empirical evidence in the literature that hierarchical distinctions between colleagues in a collaborative setting can lead to differing perceptions about the quality of their communications (Murphy, 1992; Tyran, et al., 1992), that stressful situations can make even the best-functioning workgroups revert to hierarchical submission to superiors (Weick, 1990), the

present study could discern no significant reservations on the part of junior analysts about questioning the opinions of senior analysts, expressing their own opinion in a rating committee, or protecting the independence of rating committee votes. Moreover, senior analysts in the study clearly indicated that they encouraged questions from junior analysts, and that junior analysts should question senior personnel in rating committee meetings. There was also strong agreement among analysts of all seniority levels that the face-to-face rating committee was the best approach to assigning bond ratings.

Effects of Limitations

One possible limitation of the present study was that it may have been inappropriate to assign equal weight to all analytical departments, because the virtual rating committee concept may have more utility for some groups than for others, and a weighting factor should be used to give those groups a greater proportional representation in the survey sample. In reality, the International Finance Department is more

likely to conduct rating committee meetings that involve participants from other parts of the globe than is the Municipal Finance Department, whose analytical jurisdiction is bounded by the United States domestic market. The present study gave all departments equal weight in designing the sample frame, and did not assign different weights to survey responses either. Accordingly, the study may not accurately reflect the importance of various factors by department.

Another concern was that S&P bond analysts may exhibit Orlikowski's (1992) weak technological frames, or limited understanding of the full spectrum of capabilities that group technologies offer, and that their receptivity to such software applications might be limited because of their understanding of them. This limitation could have made rejection of the null hypotheses difficult or impossible. Accordingly, it seems appropriate to recommend a further course of action involving a series of group treatments and follow-up attitudinal research.

Recommendations to Management

A primary critical assumption for any groupware recommendation is that senior S&P management must be fully committed to implement group technologies and make them an integral part of the bond rating process. Senior management support for this type of workflow automation will be a deciding factor in whether the technology yields incremental or radical changes (Klein, 1993a; Murphy, 1992). An important part of starting any educational process with respect to group technology will be an examination of the core values in S&P's organizational culture, and their underlying presuppositions, as an initial step toward achieving the behavioral changes Ogdin (1993) suggests are necessary for successful groupware implementation. S&P's Information Management (IM) Department should have the lead role in developing and implementing groupware applications that support rating activity.

To establish a foundation of understanding and receptivity among bond analysts for the kinds of group technologies that will enable S&P Ratings Group to achieve efficiencies in its workflow, a cultural change process needs to be initiated in several phases, which

can be described as Education/Demonstration, Prototyping, and Implementation.

Education/Demonstration Phase

In the Education/Demonstration phase, plans should be developed to expose bond analysts and other key employees to groupware capabilities. There are several elements to this approach: Groups of analysts known to S&P's information management professionals as "early adopters" of advanced technologies should be identified. These early adopters could be invited to participate in benchmarking tours of companies that have implemented group technologies, most notably the Lotus Notes installations at Price Waterhouse, Coopers & Lybrand, and Johnson & Higgins. Huckle and Shearmon (1993) also suggest including "subversive" members of the organization on the project team, for their unconventional ideas and creativity. The team should also include valuable people from each department in the pilot project, to underscore the importance of the effort as much as for their expertise.

Groupware vendors could be invited to offer product demonstrations and discussions of the concepts of groupware. Finally, consultants with experience in

corporate culture and its implications for technology projects should be retained to develop programs that will achieve the cultural changes necessary for success.

One important pitfall to avoid is what Schrage (1993) calls "faux delegation," where shared information-base technology ends up being a way for senior management to constantly look over the shoulders of the staff. Schrage cites a company that installed a real-time sales MIS system that let senior managers review daily results from its SBUs. This engendered second-guessing of the SBU managers' actions, and unintentionally thwarted a commitment to decentralized management. The system was subsequently modified to permit senior managers to see results only monthly, not in real-time. Whatever system S&P ultimately decides to adopt, staff should be reassured that it is designed to improve the efficiency and quality of their work, not to keep watch over them.

Also during this phase, corporate culture consultants should be working to identify key attitudinal issues that need to be addressed and managed to achieve the behavioral changes necessary to

ensure acceptance of the technological changes.

One possible educational experience that may be useful in this phase would be the use of GDSS systems to mediate one of the many planning sessions in which S&P analysts participate. Arranging to conduct the planning session in a computer-equipped meeting environment would be a novel, intellectually stimulating experience and if properly presented and used, could generate significant enthusiasm for this approach to meeting support. To engender maximum support for groupware implementation within the business units, it may be a good idea to use this approach with the Executive Committee first, and then deploy it to other planning sessions depending on the success of the process. We have seen reports of dramatic efficiency and work product gains in the literature through the use of these systems at Boeing (Kirkpatrick, 1992; Nunamaker, et al., 1993) and a 90% reduction in project cycles at IBM (Bartimo, 1990; Nunamaker, et al., 1993). Bartimo (1990) also cites the reduction of Phelps Dodge's annual planning session to a single 12-hour session. It seems likely that properly presented, a GDSS-mediated strategy planning

session for S&P senior managers could be equally productive and instructive.

At the end of the Education/Demonstration Phase, additional tracking research to gauge changes in attitudes toward asynchronous and group meeting technology seems indicated. A survey project similar to the present effort should be undertaken to determine if the education process has led to a statistically significant change in analysts' attitudes toward group technology. This survey may indicate that additional educational and training work is necessary before S&P can move successfully to the Prototyping Phase.

Prototyping Phase

Once a core group of S&P staff members has been educated regarding the capabilities and advantages of groupware, and it can be determined that the educational effort has helped to modify existing attitudes toward the "bond ratings in cyberspace" vision, it will be valuable to establish a prototype system to fully demonstrate these capabilities. Lotus Notes users, particularly Burgstahler (1993) and Weber (1993), have recommended avoiding the "canned" applications that are delivered with Lotus Notes, as

they do not live up to user expectations. Prototypes, Weber suggests, should involve actual applications that people might use for their day-to-day work. He cites an early instance in the implementation process where he and his development team put together a Lotus Notes database to manage safety reporting systems the night before showing it to plant managers. The system, because it had immediate applicability to a problem the managers were attempting to address, was hugely successful, Weber reported. Burgstahler (1993) also recommends identification of a widely used application for the initial prototype, to gain acceptance.

The first task for S&P's IM group in this phase, therefore, would be to identify promising opportunities for prototyping. Some opportunities might be databases to distribute minutes from departmental criteria committees and the Rating Policy Board, so that they are available to all analysts simultaneously; another possibility might be to develop interactive information bases about how different kinds of bond issues are analyzed in different departments.

Once prototypes are developed and implemented for end users, user groups should meet regularly with

Information Management during this phase of the project, to recommend modifications, redesigns, and other requirements. At some point in the process, the prototype should be shown and explained to other analysts, preferably in a series of small departmental groups rather than in a single large meeting. Input should be sought from other analysts at this point regarding other potential prototype applications; these should be developed and implemented for the relevant groups.

To help promote receptivity to the groupware system, it should be discussed and spotlighted during the Education/Demonstration and Prototyping Phases in communications materials distributed to Ratings Group personnel, such as the Information Management Department's newsletter.

Implementation Phase

The final phase of the process is actual implementation of Ratings Group-wide systems. By this phase, most, if not all, of the analytical staff will have heard about the prototypes, seen them demonstrated, and presumably, heard positive comments about them from the early adopters in the prototyping

process, so they will be favorably receptive to having the opportunity to use them. At the end of the process, (Huckle and Shearmon, 1993) suggests, there should be a plan to recognize some heroes and to visibly and tangibly reward the success of the implementation effort.

Given the extraordinary time pressure and workloads currently facing S&P analysts, the education and implementation process described above is likely to have a longer time horizon than it might in another work environment, and may require a significant investment in external consulting assistance to achieve.

After implementation, follow-up research should be conducted to track additional changes in attitudes toward technology.

Implications

The study of analysts' attitudes toward the use of computer technology in the rating committee process confirmed impressions gained from anecdotal evidence that analysts may have a limited vision regarding the

value of technology that goes beyond the well-accepted word processing and spreadsheet applications that they use on a daily basis. The study failed to discern any statistically significant differences in the attitudes of analysts in several subgroups, most prominently for the purposes of this study, the segments by computer literacy level and analytical seniority.

Although outside the scope of the study, the data also failed to discern any significant variances between analyst attitudes when grouped by analytical department or by gender. This apparent homogeneity of opinion regarding rating related issues is a mixed blessing: There is comfort to be taken from the fact that analysts are secure enough in their culture to disagree with each other regardless of experience or seniority, but at the same time, there is a danger that the homogenized group culture may discourage its members from stepping out of the collective to assert leadership or otherwise question accepted norms (Allcorn, 1989).

Ironically, one unexpected limitation that hampered responses to the study was the very technology on which so much of the promise of groupware depends:

the electronic mail message transport mechanism. The initial distribution of surveys via electronic mail apparently did not arrive in most of the intended recipients' mailboxes, and it was not until a subsequent retransmission/reminder a month later that most of the analysts received the survey. Because of design limitations of the electronic mail system in use at S&P the only way to obtain confirmation of receipt of messages would have been to send them individually to each recipient, a cumbersome, impractical process for distributing the same message to 150 people.

Another barrier to forming helpful conclusions may have been the distribution of responses across the Ratings Group. The Financial Institutions Department was conspicuously underrepresented in the response frame (8.43 percent, vs. 17-22 percent for all other departments), although, as noted above, the results may have been different if a greater number of responses had been received from the Insurance and International Departments, both of which tend to employ more conference call rating meetings involving other offices. A parallel concern is that the particular analysts who responded to the survey may not accurately

represent the means for their departments.

The survey design did not address specific analyst perceptions about groupware, only their perceptions about the role of computers in certain tasks that would be part of any groupware system. It might have been useful to test their familiarity with the concept of groupware and their attitude toward it. Similarly, questions regarding analysts' willingness to share information with each other might have yielded interesting results.

Conclusion

Ultimately, the success or failure of group technologies at S&P will be heavily dependent on the value placed on them by senior management, the value they provide to analysts in making the information sharing and collaborative parts of their jobs easier, and the level of training provided to users, both in the education/demonstration phase and in later prototyping and implementation periods (Burgstahler, 1993).

If there is a senior management commitment to develop and deploy group technology solutions that make sense for rating activities, and to develop cultural

and behavioral incentives leading to their regular use, then the prospects for success and acceptance will be increased. Under present conditions, however, analysts do not have a clear understanding of the advantages and benefits that accrue from groupware, and implementation without training, coaching, and encouragement might not achieve the radical transformations that are needed in a rapidly changing global capital market.

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