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The Study of GSS and Strategic Decision Making: Are We Missing Some Time?

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Introduction

The integration of information technology (IT) into organizations continues at a staggering pace, and executives and managers are increasingly concerned with the uses of IT for strategic planning and competitive advantage (Mockler & Dologite, 1991). However, the use of IT in strategy formulation is often relegated the mundane information acquisition activities reminiscent of the largely defunct data processing department. The literature on decision support systems, executive information systems, computer-mediated communication and group support systems directly show how IT augment executive and managerial activities. Although strategic decision-making (SDM) is addressed by the decision support and executive information system literature, it is not solely individual but rather takes place on behalf of an organization and among a management team (Murray, 1989; Brodwin & Bourgeois, 1984). Therefore, an exploration of group support system (GSS) utility in SDM is warranted.

The purpose of this paper is to highlight the intersection of these two literatures especially as it relates to issues of time. To do this we review a set of general SDM characteristics and current GSS knowledge.

Strategic Decision-Making

Within the strategy discourse a distinction between the strategic process (formulation and implementation) and the content of a strategy is drawn. The focus of this paper is on the SDM process of strategy formulation because the GSS domain encompasses general decision-making processes and not the content or implementation of a decision. This task is made more difficult because of a bias towards content in the strategy literature (Rajagopalan, et. al., 1993). Other views of SDM follow the traditional decision making models of rational/bounded rationality, political and 'garbage can' processes (Eisenhardt & Zabaracki, 1992; Schwenk, 1988). We have chosen an alternative view by considering many components these decision-making models allowing SDM to take any of these forms.

Rajagopalan, et. al. (1993) summarize SDM in terms of six major factors: environmental, organizational, decision, process, process outcomes, and economic outcomes. Because the logical endpoint of a GSS is a decision or solution, the first five factors are germane here.

The process by which a strategy is formulated is through a stream of strategic decisions that form a pattern that give meaning and direction for the organization (Mintzberg, 1990). Strategy is the process by which decisions about how to negotiate exchanges between the organization, its employees, its customers and the others in the external environment. Thus, it follows that SDM involves environmental, organizational, group and decision factors that are associated with the decision process and outcome. It is further suggested that a strategic decisions are often ill-structured, novel and consequential (Mintzberg, et. al., 1976). Because our intent is to intersect the GSS and SDM literatures from the perspective of GSS, we will broadly summarize SDM in terms of these components.

Synopsis of Strategic Decision-Making

The SDM literature suggests that environmental uncertainties will lead to greater information processing demands and comprehensiveness, and this relationship is moderated by the velocity of environmental change Eisenhardt, 1989; Bourgeois & Eisenhardt, 1988). Decision complexity is positively associated with

comprehensiveness and comprehensiveness leads to increased time to decision (Fredrickson, 1984; Fredrickson & Iaquinto, 1989). Power distributions extant in existing organizational roles will result in increased political activity as well as role and interpersonal conflict (Shrivastava & Grant, 1985 Bourgeois & Eisenhardt, 1988). And group heterogeneity is positively associated with the amount of information exchange and diversity of perspectives, which lead to increased creativity. Heterogeneity is also negatively related to group cohesiveness, an increased likelihood of intragroup conflict and decreased consensus. It is important to note that most SDM studies are survey/questionnaire designs which contrast with the experimental designs of GSS studies.

Mason & Mitroff (1981) perceptively summarized, that strategic decisions: (a) have numerous and complex linkages among organizational and environmental variables; (b) take place in uncertain and dynamic environments; (c) require the resolution of ambiguity in information and their sources; (d) are constrained by incompleteness in available information; and (e) exhibit conflict about decision outcomes among interested parties. In reviewing SDM we have emphasized factors that are relevant to group decision-making. These components constitute a lens through which the intersection of SDM and GSS can be examined.

Summary of GSS and SDM

A search of the GSS literature yielded 122 articles satisfying the criteria of an empirical study in group support systems such as group decision support systems, electronic meeting systems, and computer-mediated communication. A practical evaluation of computer -supported SDM is possible by considering whether the use of a GSS for SDM provides better decision outcomes than non-GSS groups, or produces similar outcomes with other benefits such as reduced costs or time requirements. With respect to performance, the results are equivocal. GSS groups take longer to reach decisions of higher quality and of greater creativity than non-GSS groups. Task complexity moderates decision quality and time to decision further compounding the practical use of GSS in SDM. However, a positive aspect to GSS is that GSS groups are able to work despite geographical dispersion and can do so asynchronously. In SDM this means that international and even domestic strategy formulation and decision-making can be accomplished with less scheduling difficulties and transportation costs. However, the question remains whether conflict can be successfully managed and or averted by integrating GSS into SDM.

A theoretical evaluation requires the reconciliation of SDM and GSS knowledge. This evaluation is less optimistic because the variables and concepts in the two literatures differ so greatly. A mapping of SDM factors and GSS research yields the pairings (SDM-GSS) of organizational factors-group composition, group factors-group history and group composition, decision factors-decision type, and process factors-process and outcome. The notable exception is that we find no pairing in the GSS research for environmental factors. If we compare our findings of GSS groups with the SDM literature along the lines of these dyads several gaps appear in terms of: group history, group heterogeneity, subject experience, task types, time sensitivity, technology/tool effects, decision consensus, and time to decision (Christensen & Fjermestad, forthcoming).

The scarcity of findings about GSS group processes is alarming even though the study of process in individual and group decision-making research provide frameworks to draw on. Although this most likely stems from the fact that GSS technologies and tools are designed to impose a process on groups, actual improvements depend on the faithful appropriation (e.g., actual use equal designed use) of that technology by the users (DeSanctis & Poole, 1994). We now turn our attention to the findings in the context of time.

GSS and Issues of Time

As previously stated GSS groups take longer to complete tasks than non-GSS groups. This finding is not surprising given that most of these studies involve users that have never or seldomly used a GSS under sever time constraints. For example, 70 percent of the studies were single session studies with 60 percent

lasting 60 minutes or less. Moreover, only 24 percent of the studies compared some time related measure of outcome between non-GSS and GSS groups.

There are several theories of group development which can be applied to highlight issues of time in groups, Tuckman (1965) and Gersick (1988). The first, Tuckman's (1965) stage approach is a normative model in which groups move through the stages of forming, storming, norming, performing and adjourning. This model suggests that GSS must not hinder if not facilitate the activities of group members in each stage of development. For example, conflict handling tools are necessary in the storming phase. If GSS cannot support these stages then it follows that group effectiveness suffers (e.g., lack of cohesiveness, poor communication, etc.) or they choose to resolve the deficiencies by non-GSS means (e.g., telephone, face-to-face, etc.), or they take longer to complete each phase. Our general lack of knowledge on group development is quite evident in this review and has been recently noted by Chidambarum and Bostrom (forthcoming).

Gersick's (1988) "punctuated equilibrium" model suggests a very different type of group process in which groups with a deadline radically transition from an initial structure--usually set in place in the first meeting--to a final structure--crystallized from a transition phase that takes place halfway to the deadline. This model provides great insight into the existing GSS research findings and real world decision-making in which deadlines are common. During a GSS session the first half of the time period is spent not only learning how the group should operate (e.g., the development of norms, roles, etc.) but also on the mastery of the technology relevant to the agreed upon structure. For the group to be effective during the second half of its operation it may require different tools and group norms than those present in the first half. Thus, the tools germane to the two phases may be drastically dissimilar and require development of new technological expertise in relatively short order. Because of this, a group may not be able to effectively use the requisite tools in each of the two phases and may therefore take longer to make a decision or the group may also choose an available non-GSS solution.

On the positive side, perhaps the benefits from distributed decision-making and information exchange extant in GSS will prove useful in an increasingly fast paced business environment. Coupled with comprehensive (and usable) tools for gathering and analyzing information GSS may be poised to improve the temporal demands of SDM for many organizations.

The theoretical implications of group process models with respect to time seem to suggest why GSS groups take longer to come to decisions than non-GSS groups. However, we know very little about the GSS group process to assert the validity of such implications. If GSS technologies are to become useful for SDM in the increasingly time sensitive business world then answers are necessary to these questions.

Discussion of SDM and GSS

The majority of the studies reviewed in this paper were experiments in which comparisons between GSS and non-GSS, technologies, or task type are made. The logical intersection of SDM and GSS results in new concerns. Our general conclusion is that research is required on ongoing groups, heterogeneous groups with the possibility of intragroup conflict (role and interpersonal conflict) completing multiple tasks, and under time pressure. In studying ongoing groups, the application of group development theories will provide insight into the interaction of groups and technology and the emergence of group structure (Chidambaram and Bostrom, forthcoming). Studies of heterogeneous groups, especially with respect to role and interpersonal conflict, and the use of GSS in managing these conflicts will produce GSS capable of enhancing group work in increasingly diverse organizations and teams. Groups seldom encounter single tasks, making it important that studies of ongoing groups with shifting tasks and feedback from past decisions are undertaken. Finally, time constraints and deadlines on groups are an understudied area in the group literature in general (McGrath, 1988) and are germane to SDM in GSS groups in particular.

Perhaps SDM may be optimized when the best of GSS and traditional group decision-making formats are combined. That is, GSS is best suited for initial information gathering and idea generation across time and

geographic boundaries, while a face-to-face group may be advantageous for decision which remain complex, ill-defined and require multi-party negotiations (Kiesler & Sproull, 1992). In any case, the SDM context provides new opportunities for studying groups, especially GSS groups.

Conclusion

Through our review the GSS literature with respect to a set of general characteristics about SDM we found evidence for and against SDM by GSS groups. Gaps have been identified that require both empirical study and new theoretical approaches. McGrath and Hollingshead (1994) conclude that future group support systems research should be pursued in the areas of multiple criteria for assessment; member and group characteristics, task-technology variation, groups as multi-functional systems, and temporal dimensions of group work. Although we agree, we take a further step in suggesting that a specific decision type, strategic decision-making, provides a context from which needed GSS knowledge can be generated and applied. For example, research on GSS group process like DeSanctis and Poole's (1994) use of 'Adaptive Structuration Theory' are in line with traditional group studies of the same effect. Given that knowledge about GSS and non-GSS group performance is important, studies of group interaction and the resulting gains and losses are needed. If this course is taken GSS research can produce knowledge that will allow for generalizations across environmental, organizational, group and decision factors necessary for the next generation of GSS and SDM research.

The specific impacts of time in GSS and SDM research suggest two major concerns: (1) GSS groups often take more time to complete a task than their traditional counterparts, (2) the findings of GSS outcomes under varied time pressures are equivocal, and (3) existing group process models provide insight into groups and time.

In this paper we also utilized an up-to-date review of the empirical GSS literature (see Christensen & Fjermestad, forthcoming). Of other reviews, (Benbasat & Lim, 1993; McGrath & Hollingshead, 1994) we covered significantly more studies (see references for those studies included in this and others reviews). However, as is the case with any review, it was not possible, nor feasible, to explore all the areas of inquiry related to groups, technology, decision-making, and performance.

The potential benefits of GSS for SDM made this exploration important because: (a) these are the decisions that have a wide and permeating effect on organizational survival and performance and (b) these decisions are becoming more complex as the availability of information increases (Stamen, 1990). Moreover, the impact of time pressures on decision-makers makes the potential of distributed decision-making all the more promising.

References

Available from the first author.

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