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### Intervening with GSS to Facilitate Meetings - An Action Research Approach

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**Intervening with GSS to Facilitate Meetings -  
An Action Research Approach**

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## *Abstract*

In recent years, Group Support Systems (GSS) have seen increased use in the business environment. However, published research seldom indicates why it was decided that a GSS was suitable for meeting support. In this thesis we employ an instrument to collect participants' perceptions of meetings that are not supported with GSS technology. We then feed this information into an action research mechanism that enables us to identify meeting process characteristics that subsequent provision of a GSS will help to improve. Data is collected from several meetings (cases) on a longitudinal basis with meeting processes studied on a continuous basis. Recommendations can then be made for focused intervention with a GSS.

## 1 Background and Objectives; Research Questions

Group Support Systems (GSS), a technology that enables and facilitates various forms of group communication, has been suggested as a tool to improve meeting productivity. A substantial number of experimental studies have been carried out, as well as an increasing number of field studies (see Dennis et al., 1991 for a review). Field study data suggests that GSS may indeed help meetings to be more productive, as well as improving participant satisfaction with the meeting processes and reducing costs of time and money (see e.g. Post, 1993; Hitchcock, 1994).

A noticeable feature of the published GSS research is that it tends to involve meetings supported on a one-off basis, with little attempt to measure changes to the meeting process longitudinally. Furthermore, while field studies have involved genuine business or professional groups, the accounts of these studies, as published in the literature, seldom indicate why it was decided that a GSS would be suitable as a means of improving a group's productivity.

We agree with Grudin (1994) that it is implausible to assume that GSS will help all meetings no matter what their characteristics. We also believe that in the real world, meetings are seldom one-off affairs. More likely, they will occur on a more or less regular basis with a more or less regular membership, while discussing issues that themselves extend over a series of meetings. Thus, it is necessary to attempt to study these extended meetings and their processes in order to be able to ascertain how useful a GSS actually is to a meeting. Before we go further, it is useful to clarify precisely what we mean by a 'meeting'. In a GSS context, individuals' communication can be supported in either face-to-face or dispersed mode, with same time (synchronous) or different time (asynchronous) interaction. The word 'meeting' applies loosely to all combinations of these contexts and therefore does not require that the meeting members actually see each other.

In this research we take a longitudinal approach to the examination of business and professional groups involved in tasks that involve the generation, discussion and evaluation of ideas and potential solutions to problems over a period of time. Such tasks have been characterised by Mason and Mitroff (1981) as hydra-like in their entangling complexity. They may not have an end, and the task may not be completed. Dennis et al., (1989) observe, nonetheless, that "*these tasks are particularly appropriate for GDSS support*" (original emphasis). Indeed, Bui and

Sivasankaran (1990) have argued that complex tasks lend themselves to GSS. They found that as task complexity increases, so the effectiveness of GSS-supported groups becomes more apparent when compared to groups that do not have GSS support. This is corroborated by Vogel et al. (1987) who observe that tasks that are too simple will undermine the effective use of GSS.

Our research question, thus, is as follows:

*How can we improve meeting processes in business and professional environments through an application of GSS?*

In order to answer this question, we need to consider appropriate techniques for collecting and analysing data that will reveal whether or not a GSS is applied successfully. Although it is theoretically possible to measure the quality of group decision outcomes, generally speaking it is true that objective determinants of meeting quality and effectiveness are not readily available. Indeed, it has been argued that it is very difficult to link decision processes with decision outcomes except in the most strictly controlled of social experiments (Rohrbaugh, 1987). Furthermore, we are not so much interested in the success, or otherwise, of the meeting, but more in whether or not a meeting's processes could be improved through the provision of a GSS. Therefore, we choose to measure participant perceptions of meeting processes. In order to collect data about participant perceptions of meetings, and thus learn how to apply GSS, we need:

- to develop an instrument that can be used to measure meeting processes and identify process-related problems;
- to observe how a GSS can mediate identified processes;
- to measure improvements/deteriorations in group meeting processes over time;
- to analyse which meetings are more likely to benefit from an infusion of GSS.

## **2 Research Methodology**

In this research, we have tried to avoid what may be characterised as paradigmatic parochialism, i.e. the insistence on using a single paradigm for research. Indeed, many authorities have called for a pluralism of research methods in order to improve the quality of research (e.g. Kuhn, 1970; Kaplan and Duchon, 1987). Our over-riding

concern is that the research we undertake should be both relevant to our research question and rigorous in its operationalisation. Overall, we believe that an interpretivist philosophy is required for this purpose, i.e. the understanding of why and how groups adopt, and adapt to, Group Support Systems.

In order to measure how organisations can improve their meetings with the support of GSS, we will make recommendations for use of the GSS after analysing existing meeting processes. To do this without being involved would be impossible. However, recognising the lack of objectivity sometimes associated with interpretivist research methods, we adopt a scientific and rigorous approach to the development of our key research instrument. It has been pilot tested with several groups, then used to collect data from a large sample, with the construct items confirmed using factor analysis. Both factor loadings and alpha (Cronbach) scores were generally above .7.

While a large number of research methodologies have been identified, Galliers (1991), for example, listing fourteen, we employ three in combination: case studies, action research and survey research.

## **2.1 Case Study Research**

The case study is considered by Benbasat et al. (1987, p.370) to be a viable methodology for three reasons:

- It is necessary to study the phenomenon in its natural setting;
- The researcher can ask "how" and "why" questions, so as to understand the nature and complexity of the processes taking place;
- Research is being conducted in an area where few, if any, previous studies have been undertaken.

We detail how we incorporate the case study approach into our research in 2.4 below.

## **2.2 Action Research**

Action research was developed as a methodology by the social psychologist Kurt Lewin (1946). According to Kemmis (1980) it involves the application of tools and methods from the social and behavioural sciences to practical problems with the dual intentions of both improving the practice and contributing to theory and knowledge in the area being studied. Action researchers either participate directly, or

intervene, in a situation or phenomenon in order to apply a theory and evaluate the value and usefulness of that theory (Dick, 1993; Vreede, 1995). Thus action research can be used not only for theory testing, but also theory building and/or expanding (Galliers, 1991). When undertaking action research, the researcher starts with planning, continues to execution (intervention), observation and finally reflection, before returning to planning and a new cycle (Dick, 1993).

Some researchers position action research as a subset of case study research (Benbasat et al., 1987; Galliers, 1991), but others (e.g. Vreede, 1995) observe the differences between the two approaches and thus appear to suggest that they should be treated as separate methods. We contend, nonetheless, that the three reasons that Benbasat et al. (1987) believe make case study research viable are equally true for action research. We highlight the differences between action research and case studies as follows:

**Table 1 Case Studies and Action Research (adapted from Vreede, 1995)**

<b>Case Study</b>	<b>Action Research</b>
Researcher is observer	Researcher is active participant
Exploratory, explanatory or descriptive	Prescriptive, intervening
Focus on "how?" and "why?"	Additional focus on "How to?"
May be positivist or interpretivist	Interpretivist

Action research is thus undertaken by those who intend to effect change whilst pursuing their research (Susman and Evered, 1978). Such a research methodology is strong in the sense that it provides the researcher with an inside and working view of a case, but weak as it may not be as objective as other methodologies.

### **2.3 Survey Research**

In survey research, an instrument is developed from theory and attempts to measure one or more constructs. This instrument is typically distributed to the respondents in the form of a questionnaire. Data collected from the respondents can be used to validate the instrument, as well as to reveal underlying elements of the constructs measured. In this research, we develop an instrument to measure meeting processes. This instrument is administered to meeting participants both before and after a GSS is implemented on a longitudinal basis. It is a key data collection device.



In essence the instrument consists of 19 meeting process items grouped into five constructs - communication, discussion thoroughness, teamwork, status effects and perceived process efficiency. A single criterion which relates to participant satisfaction with the meeting is also included. The instrument has been validated with data from a large sample (405 responses which is 30.9% of the sample).

#### **2.4 *The Action Research - Case Study: A Combined Approach***

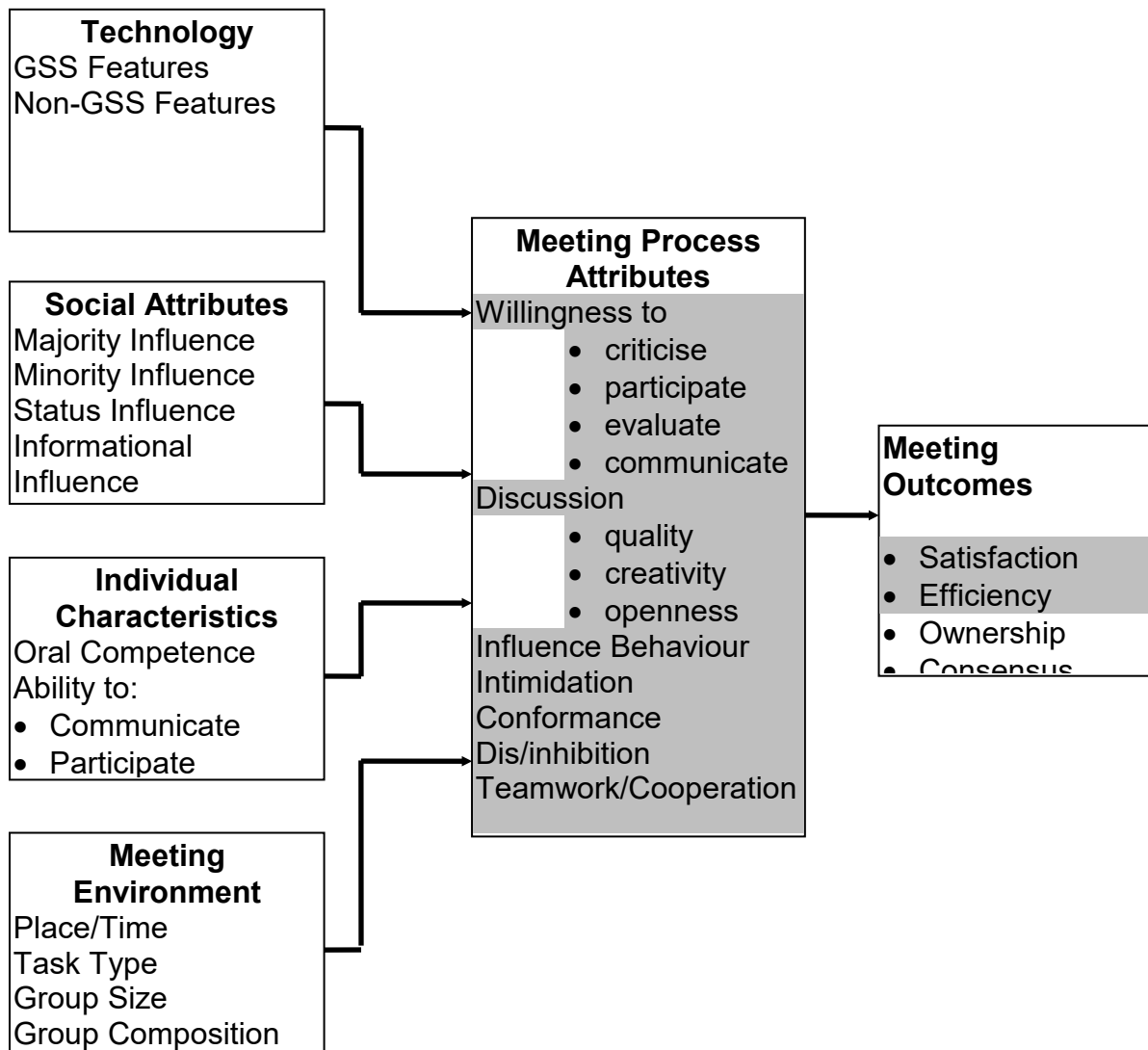
The phenomenon we are measuring (group meetings that involve business and professional people in discussion-based tasks in which they have a vested interest) is too complex, we believe, to be constructed and measured experimentally, particularly as we should pay attention to the organisational idiosyncrasies that permeate all true natural settings. Asking "how" and "why" questions will help us to understand the nature of the processes, while asking "how to" questions will assist us to interpret the data we collect and so to improve our support of the groups whose meetings we are facilitating. We are not aware of previous research in this area, though we shall apply existing GSS theory as well as attempt to extend that theory through the action research approach. Case Studies are acknowledged as providing a suitable climate for data collection and theory construction/extension (cf. Benbasat et al., 1987).

We believe that in this bi-methodological combination, the researcher should take on the role of a consultant and observer but avoid becoming a participant as far as is possible, restricting himself to the facilitation of meeting process dynamics. To clarify further, the researcher is the chauffeur of the technology, but is not the manager of the meeting. He manipulates the technology so as to meet the needs of the group, but does not concern himself with actual content, which is the domain of the meeting owner or manager. In order to ensure construct validity, we observe the requirement for multiple data collection methods (Yin, 1984). The use of an empirically validated instrument adds to the rigor of the research.

Three key areas of literature are relevant to this research - a) Group Support Systems; b) the socio-psychological aspects of group processes; and c) the nature of the relationships between national and organisational culture, and Group Support Systems. Two of these areas are summarised in a research model that is fundamental to the meeting process instrument and to our conception of meeting processes. Whilst previous researchers have drawn up similar models (e.g. Dennis

et al., 1988), our model highlights areas of particular concern to our research, notably the social aspects of group dynamics. A concise version of the model is presented in Fig 1 below. This model was developed before the survey instrument was constructed and therefore before any data was collected. As such, it may be necessary to modify the model at a later date if additional meeting processes are revealed or if some of those we have included prove to be irrelevant.

**Fig 1: A Framework for Meeting Processes and Outcomes**



### **3 Research Plan - Operationalisation.**

It has been commented that "...the use of GDSS technology should be fine-tuned to the task and setting for which it will be used" Gallupe and McKeen (1990, p.11). Cass et al. (1992, p.181) take this notion of fine-tuning a step further, observing: "...we must better understand how to design the technology, how to train people to use it, and how to better support different types of groups with it. Practitioners must carefully identify which groups will benefit from groupware, which functions of groupware are useful to a particular team ...".

### **3.1 Selecting an Organisation**

Substantial care is taken over organisation selection. We do not assume (opportunistically) that an organisation (and its management culture) will always be ready to adopt GSS for discussion and decision making activities. Therefore, for each potential organisation or group, the researcher discusses the purpose and operational nature of GSS with a contact person, usually a middle manager, explaining how GSS have been used in other organisations, as well as giving details of possible scenarios where GSS are likely to promote gains in meeting productivity, efficiency and so forth. Two basic criteria for eligible meetings are that they: a) occur at regular and reasonably frequent intervals (this aids the meeting participants to learn and remain familiar with the technology); and b) involve primarily discursive rather than disseminative topics.

If the organisation's representative believes that GSS could indeed be introduced to the organisation, the researcher attends a sample meeting so as to gauge the general meeting atmosphere, and observe meeting processes and interpersonal interactions first-hand. Key questions that the researcher attempts to answer at this stage are: Is the meeting membership hierarchically structured and what impact does this have on meeting processes? Do all meeting members appear to participate freely and at will? Do some meeting members appear to influence or intimidate others (whether intentionally or not)? Do meeting members appear to have a lot to say but have to wait for the chance to do so? Does the group make reference to materials that may have been discussed in previous meetings? Through understanding meeting processes and interactions, it is usually possible to 'interpret' how appropriate a GSS is *likely* to be for a given meeting. If judged appropriate by the researcher and organisation, the instrument (described above) may also be used to collect data about the meeting processes.

### **3.2 Data Collection and Analysis**

Yin (1984, p.78) notes that case studies require multiple data collection methods including:

- direct observation of activities and phenomena and their environment.
- indirect observation or measurement of process related phenomena;
- interviews - structured or unstructured.

Furthermore, since Action Research is cyclic in nature, data collection on several occasions is required in order that we can build up patterns not only of how the meeting members learn how to use the software, but also, and more importantly, to measure how identified meeting characteristics are improved, worsened or otherwise changed through the use of the technology.

The instrument enables us to identify in greater detail some characteristics of the meeting process and then prescribe an intervention with the GSS to help improve these characteristics. In this way we overcome the weakness we perceive in much previous GSS research, i.e. the failure to identify why a particular GSS operationalisation was used, even why a GSS was used at all. We do not make the assumption that GSS will always have a positive effect, though we do believe that having undertaken a careful selection procedure to locate appropriate meetings, we increase the chance of the GSS use being successful. As well as attempting to use the GSS to support identified meeting process weaknesses or problems, we also attempt to strengthen those positive features that we identify. The precise nature of the intervention depends on the individual case studies, and hence must be flexible.

Following each GSS supported meeting, the questionnaire is completed by all meeting participants. The post-session questionnaires are administered through the GSS, since this permits us to obtain more accurate feedback from participants who are not, for example, allowed to give the conflicting answers (multiple ticks, entries, etc.) sometimes found on hand-written questionnaires. Since the participants use GSS for their meetings, it seems reasonable to require them to use a GSS tool for process-related data collection as well.

The data collected is analysed with a view to extracting meeting process characteristics that give cause for concern. If, for example, we observe that a majority of participants feel intimidated by the behaviour of some other members, we might attempt to reduce this through anonymous communications, thereby enabling ideas to be separated from their authors and so removing status cues. Equally if the result orientation of the meeting seems weak, additional focus provided by the facilitator may be required. This data is supplemented by observations made by the researcher during the meeting - who is talking, who they talk to, what they talk about, what they prefer to talk rather than type, and so on. It may also be supplemented with information derived from interviews conducted with meeting members separate

from the meeting. Data collected is also analysed in terms of the constructs in the framework in Fig 1 above. The framework indicates that meeting efficiency and participant satisfaction with the meeting as a whole depend on the meeting processes. This has been confirmed by factor analysis (described above in 2.3).

At the present time we are working with a number of organisations and groups, including: Hong Kong's Mass Transit Railway, and the Royal Hong Kong Police Force.

A single case has been completed to date, namely a strategic planning task group in a university. This task group met on three occasions over a one-month period. Initial survey data suggested that a key problem in the task group related to the organisation of information and the use of time in the meeting, i.e. meeting efficiency. GSS use was therefore suitable and noticeable improvements were made in these contexts during the first meeting. The meeting owner was especially pleased with this meeting, observing that far more had been accomplished than he had expected, and that thanks to the GSS's organisation of material, it was much easier to see which tasks had been completed and which remained to be done on the next occasion.

In the second and third meetings, the group members showed little interest in using the GSS at all, preferring to engage in face-to-face discussion. The meeting owner employed the GSS as an elaborate group authoring tool, with him as the chief author. The advantage, as he later explained, was that he was able to control the group better and focus in on certain items he needed to discuss. At the same time, he could use the GSS as a means to disseminate the agreed-upon information to all the meeting participants. At the end of the third meeting when the task was completed, the meeting owner expressed his interest in making use of the GSS tool on future occasions, especially in the early, formative stages of a task when the idea generating and organising tools could be put to best use.

A second case is currently in progress and will be completed shortly. Results of this case will be presented at the Doctoral Consortium.

#### **4 Discussion of Potential Difficulties**

A number of potential difficulties arise during the course of this research. Since we are employing an action research methodology, we rely on collection of data about meeting processes from our own observations, from interviews and from an

instrument developed for this purpose. While we can treat each case separately, concentrating on the improvement of meeting processes therein, it is also necessary to draw together the threads of experience from the different case studies. Only in this way can we attempt to devise more generic prescriptions of intervention strategy for groups. The more cases we are able to investigate, the more data we will collect and so the more generalisable will the data be, but equally so the task of drawing conclusions from the data will become harder. We could restrict this risk by focusing on a smaller sample of meeting types, but then the generalisation will be reduced as well. In practice, due to the fact that there are no existing GSS users in Hong Kong, it has been necessary to persuade organisations both to *adopt* the GSS and then to *participate* in the research project. At a somewhat more fundamental level, a concern I have relates to description of case studies. Much is made of the need to be precise in case study (and by correlation action research) description so as to avoid criticisms of "story telling". What is the difference between a good case description and a story?

## **5. Conclusions**

In this research we propose a combined case study and action research approach to the facilitation of meetings in business and professional environments using GSS. Through this approach we actively seek to improve the meetings of our 'clients' - the organisations which have graciously agreed to participate in our research. We particularly focus on meeting processes. This research attempts to contribute to the IS domain by suggesting that interpretive research is essential if we are to understand, even predict, how real organisational processes take place and the manner in which these organisations adapt to and adopt new technologies such as GSS. The research could be extended in a cross-cultural manner by considering cases in different national and organisational cultures. Although this is beyond the scope of this research, it is a necessary future development so as to ensure that we apply appropriate methods to different cultural environments. It is not good enough to take GSS as a panacea for all meetings, irrespective of their individual idiosyncrasies and cultural variations.

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