Cultural Diversity and Group Decision Support Systems

Wendy Cukier
Administration and Information Management
Ryerson Polytechnic University
71417.763@compuserve.com

Catherine Middleton
Schulich School of Business
York University
cmiddlet@yorku.ca

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Introduction

This chapter explores the implications of cross-cultural issues, broadly defined, to the implementation and use of electronic communications technology in organizations. It discusses various perspectives on culture and diversity, critiques several models of electronic group communication and support systems, and offers a model to consider the implications of cultural diversity for electronic group communication.

Cultural diversity is increasing in the workplace. Coping with workforce diversity has been identified as one of the most serious issues confronting organizations today (Mighty, 1991). The influx of women, the aging population, and increases in immigration have altered the composition of the workforce in North America. At the same time, the ability of communications technologies to bridge time and space is increasingly allowing individuals and groups from different cultures to work together electronically. Finally, the push to globalization is leading many organizations into new countries and cultures. However, there is limited theory which addresses the impacts of the these changes on management or, more specifically, on the management of information systems and communications technology. This paper will address these issues, with a specific focus on technologies that support work groups.

While much has been written on the relationship between organizational issues and group technologies and more has been written on the effects of diversity on organizations, there have been few efforts to link the two. Most group research before 1981, and all group decision support systems (GDSS) research before 1988 was carried out in the United States with American subjects (Dennis, George & Nunamaker, 1988; Pinsonneault & Kraemer 1989; Kraemer & Pinsonneault, 1990). Theories in psychology, sociology, group behavior and related disciplines that deal with people and organizations are ethnocentric and there is growing recognition that cultural differences have important implications for group and organizational behavior (Boyacigiller & Adler, 1991; Hofstede 1980, 1985). GDSS technology interacts with the behavior patterns and communications processes of people in groups, but the applicability of the body of American-based GDSS research findings to other cultures is unknown (Raman & Wei, 1992). This paper will review the literature on cultural diversity and discuss the implications for GDSS.

Current Information Technology and Cross-Cultural Issues

The study of cross-cultural issues in information technology is embryonic. Much of the work to date has focused on exploring technology transfer and information systems implementation in other countries. For example, Babington (1987) investigated computerized planning systems and management information reporting networks in Africa. Ein-Dor, Segev & Orgad (1993) examined the effects of national culture on information systems, while Umanath & Campbell (1994) proposed a conceptual framework to study technology diffusion in multinational businesses, using the specific examples of the United States and Singapore. Burn, Saxena, Ma & Cheung (1993) discussed information systems development and technology exploitation issues in the political and cultural context of Hong Kong, and their implications for global organizations operating in the Pacific Rim. Schill, Bertodo & McArthur (1994) reported on the

problems of technical risk, changing technologies, differing cultures and management styles in an international alliance between automotive manufacturers.

There has also been some work on communications technologies. Straub (1994) discussed the effects of culture on technological implementation, in a study of e-mail and fax usage in Japan and the United States. Blanchette (1994) provided a preliminary discussion of technology transfer in culturally diverse work environments.

Chidambaram (1992) noted that basic modes of communication differ among people from different national and cultural backgrounds. These differences are apparent in such areas as:

- the locus of decision making
- initiation and coordination mechanisms
- temporal orientation
- mode of reaching decision
- decision criterion and communication styles.

These differences tend to hinder communication among groups from different cultural backgrounds. Future research is required to examine computer support for group decision making, conflict management and negotiation in cross-cultural settings. Other areas for research include cross-cultural issues in learning and training, the development of multilingual groupware, and issues in management and implementation of technology for cross-cultural group support.

However, despite identification of important research issues, scant work has actually been completed in this area. In one notable example, Chidambaram and Kautz (1993) analyzed the use of Electronic Message Systems (EMS) in groups with diversity in values, learning styles and personality types, as measured on a variety of scales. They maintained that the anonymity of EMS, the electronic recording and display capabilities and the process structuring better accommodates diversity than face-to-face communication.

Ho, Raman & Watson (1989) examined the effects of culture on group decision support systems. Watson, Ho and Raman (1994) provided empirical support for the inclusion of culture as fourth dimension of GDSS, based on a study of GDSS use in Singapore and the United States. (DeSanctis and Gallupe [1987] suggest the dimensions of GDSS are group size, member proximity and task type.) However, despite the widespread use of multinational workteams in global organizations (Ives, Jarvenpaa & Mason, 1993), GDSS research has not yet addressed the issue of cultural diversity within groups. Indeed, Raman and Wei (1992) note that many of the assumptions underlying current GDSS research are culturally constrained. GDSSs are built on the assumption that it is important for each group member to have an equal opportunity regardless of status to express an opinion in a group. It is presumed that each group member prefers open and direct communication, and that the goal of group discussion is to maximize organizational objectives rather than group harmony. But these perspectives are reflective of American

cultural norms. For many other cultures, the assumptions underlying existing group decision support systems are simply not valid.

Recognizing that research on cultural aspects of group technologies is new and limited, there has been no effort to develop a conceptual framework for examining the implications of cultural diversity for GDSS. In addition, the research proposed and conducted to date has tended to:

1) emphasize issues related to implementation of GDSS in new cultural contexts (e.g. Singapore) rather than the implications of implementing GDSS across cultural contexts or in culturally diverse groups;
2) define cultural diversity exclusively in terms of nationality rather than in layers of diversity (profession, gender, age etc.);
3) focus on prescriptive functional models where culture is just another input variable; and
4) omit discussion regarding the relative importance of group versus individual characteristics and the relationship between organizational culture and sub-cultures.

This chapter will address these issues by reviewing perspectives on cultural diversity and considering the implications for electronic group communications. It will suggest a model for understanding the implications of cultural diversity for electronic group communications.

The Cultural Dimension

The analysis of workplace culture has been a focus of organizational behavior studies for many years. (Pettigrew, 1979; Administrative Science Quarterly 1983; Frost et al., 1985; Schein 1985; Meyerson & Martin 1987; Van Maanen, 1988). Workplace culture encompasses the values and beliefs expressed in artifacts, symbols and practice. The focus on organizational culture has shifted attention from organizational structure, hierarchies, and policies to language, traditions, rituals, myths and stories. A cultural perspective shifts attention to the significance of working life and shared systems of meaning.

Culture is an enacted system of beliefs, symbols and behaviors which binds individuals in groups. It is a mechanism for collective sense making. Culture is collective programming of the mind which distinguishes one group or category of people from another (Hofstede, 1991). This programming includes the learning of ideas, habits, attitudes, customs and traditions (Harris & Moran, 1991).

Cultures can be characterized in a number of ways. Hofstede's (1983) dimensions are individualism-collectivism, power distance, uncertainty avoidance, and masculinity-femininity. The individual-collectivism dimension describes the social frameworks within a culture. In an individualistic society, the social frameworks are loosely knit. Individuals look out for their own interests, and those of their immediate families. In contrast, collectivist cultures are characterized by tight social frameworks, in which groups look after their own members, and the will of the group determines the behavior of its

members. Power distance refers to the distribution of power, and the ways in which a culture deals with the fact that people are unequal. The uncertainty avoidance dimension addresses the way in which members of a culture handle the uncertainty of the future. In weak uncertainty avoidance cultures, the fact that the future is unknown is of little concern, as members take life one day at a time. In strong uncertainty avoidance cultures the society attempts to manage and avoid risk and uncertainty. The fourth dimension, masculinity-femininity encompasses a culture's dominant values. In a feminine society dominant values emphasize quality of life and concern for others. In contrast, masculine societies tend to be materialistic, with less concern for the people within them.

Adler (1991) outlines six dimensions to describe cultures and investigate differences across cultural environments. The first dimension encompasses the nature of people, and assumptions as to whether people can change their behaviors and attitudes. The second dimension considers the individual's relationship to nature. Is the underlying belief one that domination over nature is acceptable, or should harmony be sought? Thirdly, what are people's relationships to others? Does the individual have a group focus or an individualistic focus? (This dimension is similar to Hofstede's individualism-collectivism.) The activity dimension questions an individual's work activities. Does the individual work hard to achieve goals, or is only a minimum amount of work performed? Conception of space is the fifth dimension, and addresses the extent to which an individual operates in a public or private manner. Finally, the sixth dimension concerns an individual's temporal orientation. Does the individual focus on future goals, or remain rooted in past traditions?

Hall (1977) uses the notion of context to describe cultures. High-context cultures are characterized by mutual causality, where events may have multiple meanings and can only be understood in context. In high-context cultures communications are more subjective and multilayered, colored by relationships, history and status. In contrast, in low-context cultures, events have single and universally understood objective meanings. Cultures are also distinguished by their perceptions of time. The monochronic perspective views time as infinitely divisible, but allows only one thing to be done in a given unit of time. In the polychronic view of time, actions can be simultaneous, and efficiency is not as important as relationships. Perceptions of space also define cultures. There are strong cultural norms regarding distance between people. For example, Hall notes the North American cultural consensus around what are considered intimacy, personal, social and public distances between individuals.

Devereaux and Johansen (1994) synthesize elements of Hall, Hofstede and Adler, proposing a model of culture with five dimensions. The equality and power dimension refers to power distribution and the importance of hierarchy. Time is seen as monochronic or polychronic. Context refers to the elements that surround and give meaning to a communications event. The language dimension measures tolerance and acceptance of individuals whose language skills deviate from the predominant language within the culture. This dimension of culture is particularly important in understanding diversity within groups in the workplace. Information flow refers to the way in which messages are transmitted, including privacy and security issues. Some cultures rely

heavily on objective information in decision making and problem solving, while others are more dependent upon informal networks as an information source.

As is shown in Table 1, there are several dimensions that are common descriptors of culture. But each perspective includes some unique elements that can be combined to form a richer understanding of the phenomenon of culture. It is these aggregated dimensions that must be considered when assessing cultural implications for group decision support systems.

Table 1: A Comparison Model for Conceptualizing Cultural Dimensions

Hofstede	Adler	Hall	Devereaux & Johansen	Aggregated Dimensions of Culture
individualism-collectivism	relationship to other people			individualism-collectivism
power distance			equality-power	power distance
uncertainty avoidance				uncertainty avoidance
masculinity-femininity				masculinity-femininity
	nature of people			nature of people
	relationship to nature			relationship to nature
	activity			activity
	space	space		space
	temporal orientation	time	time	temporal orientation
		context	context	context
			language	language
			information flows	information flows

Like culture, cultural diversity is also defined in many ways. Perhaps the most obvious dimension is ethnolinguistic, but there are other dimensions or layers as well (Hofstede, 1991, Loden & Roesner, 1991). These layers of culture include:

1) national
2) regional
3) ethnic, religious and or linguistic
4) gender
5) generation or age
6) social class
7) organizational, corporate levels, profession or work experience
8) affectational orientation

9) cognitive style
10) physical ability
11) education
12) learning style
13) marital status

Within organizations teams may be composed of people who belong to one or more cultural layers. Ethnolinguistic differences pose challenges when some team members are working in a second language. Nationality often brings with it diverse historical values and traditions. For example, English and Americans are similar ethnolinguistically but have different national cultures and values. Professionals with different education and work experiences often share values and belief systems. There may be more common values within certain professional groups (e.g. engineers) across companies than there are between professional groups within the same company. Differences in male and female values and communications styles have also been well-documented. Age or generation brings with it shared experiences and values.

A corporation's culture is not homogeneous but consists of diverse subcultures, as does a country's culture. The relative strength of the organizational culture relative to the subcultures may vary. At the same time, however, there is recognition that differences within groups are often as great or greater than differences across groups. Further work is needed to better understand the benefits of framing the discussion in terms of culture rather than individual differences alone.

Membership in various cultural groups can have a powerful role in shaping values. Studies suggest that diversity affects individuals' mental programs or value systems. Carter (1991) concluded that there is evidence to support substantive differences between cultures on value orientations. Individual variables affected by culture include self-esteem, racial ethnic identity development (Parham & Helms, 1985) and cognitive style (Triandis et al., 1986).

A range of instruments has been used to measure value differences and diversity in groups. The Rokeach Survey of Values (Rokeach, 1973) was developed to measure American values, and may be used to assess terminal values (i.e. desirable ends or goals) and instrumental values (i.e. desired standards of conduct to attain a goal). Questions over its appropriateness for use in non-Western societies led to the creation of a Chinese Value Survey (Hofstede & Bond, 1989). Cognitive diversity can be measured using the Myers-Briggs Type Indicator (Myers, 1980). Sue's (1991) model for cultural diversity assessment analyzes organizational functions, barriers and cross-cultural competencies.

Adler (1983) maintained that cultural dominance, or the organizational policies which favor the dominant culture and exclude others, permeates organizations. Apart from problems of overt and systemic discrimination, there is recognition that cultural differences can impede group performance and thus organizational effectiveness. Status and power differences may impede effective group action and problem solving, but once these are overcome heterogeneous groups may outperform homogeneous ones (Shaw,

1981). Increased diversity may have detrimental effects on group performance in the short term. At the same time however, there is recognition that diversity can have many advantages in creating more creative and innovative solutions, better customer services, and better adaptive skills (Adler, 1983, Lindsay, 1990). Researchers have identified a wide range of ways in which diversity can affect organizational behavior and outcomes (Alderfer, Alderfer, Tucker & Tucker, 1980; Burger & Bass, 1979, Hofstede, 1980).

A direct consequence of diversity can be communication distortion. Harris and Moran (1991) discuss the effects of losing all familiar cues and symbols of social discourse. Cross-cultural communication can result in implicit and often contradictory assumptions made by individuals of different backgrounds. Verbal signals (such as nicknames or slang) as well as nonverbal signals (hugging or back patting) can be misinterpreted, and information networks often isolate nonconformers (Adler, 1991).

When communication senders and receivers are of different race, age or sex, they contribute less equally and information is less equally valued than when they are similar (Kanter, 1977). Compatibility and trust between senders and receivers also affects content.

Values and norms vary among different cultural groups. The emphasis on individualism versus collectivism affects work goal priorities (Hofstede, 1980). Collectivist cultures place more emphasis on needs of the group social norms and duty, shared beliefs and cooperation. Collectivists are more likely to sacrifice personal interests for the attainment of group goals and are more likely to enjoy doing what the group expects of them.

The way in which conflict is handled also varies. In eastern cultures, for example, belongingness may rank above ego needs such as self actualization; disagreement may be more effectively expressed than open and direct confrontation and preserving group harmony may be more important than maximizing organizational objectives (Hofstede, 1980). Many non-European cultures discourage confrontational problem solving approaches, tending towards non-confrontational and avoidance behaviors (Chua & Gudykunst, 1987; Tang and Kirkbride, 1986).

Research on group performance and decision making (Hoffman & Maier, 1961, Shaw, 1981) suggests that a variety of opinions, skills, information and perspectives will have a positive effect on group efficiency and effectiveness. High quality solutions are more likely to emerge from heterogeneous groups (Hoffman & Maier, 1961) and there are dangers associated with homogeneity (e.g. groupthink, Janis, 1972). Culture produces differences in decision making (Burger & Bass, 1979). American managers tend to rely more on precise data for decision making and place more emphasis on planning than those in high-context cultures.

Table 2: Summary of Organizational Processes and Outcomes affected by Cultural Diversity

Organizational Processes	Outcomes
behavior	group performance
interaction	decision quality
planning	efficiency
management	effectiveness
communications	adaptive skills
information sharing	customer service
cooperative and competitive behavior	consensus
decision making	satisfaction
leadership	action
planning	equity
conflict resolution	commitment
formal and informal networks	power consolidation/sharing

With growing diversity in the workplace and increased globalization, much has been written about cross-cultural issues focusing on the implications of national cultures, (for instance between Japanese and American) on negotiation and management (Oikawa & Tanner, 1992) rather than on diversity. In addition, most studies of cross-cultural communications have tended to focus on traditional forms of communication like face to face interactions and correspondence, rather than on emerging electronic forms such as electronic mail, teleconferencing, and groupware. Given the ways in which these technologies interact with organizational structures and processes, viewing them through the lens of cultural diversity may provide new insights into their development and application.

GDSS Research

Group decision support systems "combine communication, computer, and decision technologies to support problem formulation and solution in group meetings" (DeSanctis & Gallupe, 1987: 589). The term embraces a wide range of technologies, including electronic mail, teleconferencing, electronic boardrooms and decision support software. It is, however, something of a misnomer when used, as it is from time to time, to describe group support systems independent of decision making. Contrary to popular wisdom, a large proportion of group work does not involve decision making, although it may be facilitated by some sort of decision support system. Much more frequently groups serve to develop and expose consensus in some combination of acts that are geared to create a common, shared vision of problems and solution sets. The development of commitment and direction to implement is often more important than the decision itself. An important outcome is building collaborative consensus. Kraemer and Pinsonneault (1990) recognized this, and proposed a distinction between group decision support systems (GDSS) and group communication support systems (GCSS). This distinction, however, has not been widely adopted, although the broader term "group support systems" (GSS) is gaining currency among researchers (Jessup & Valacich, 1993).

In other circles, predominantly the computer science/human factors community, the term "computer supported cooperative work" (CSCW) has gained currency to encompass e-mail, computer conferencing and videoconferencing support for work, education and play,

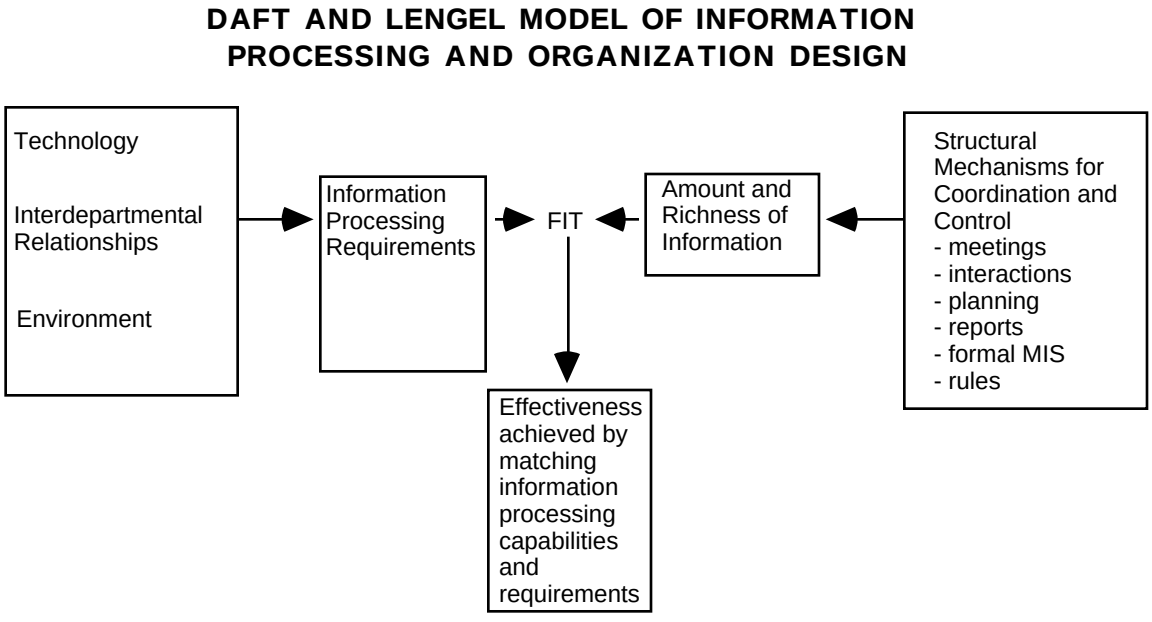
in a variety of groups (Kraut, 1992). Within some segments, "computer mediated communication" (CMC) is used (Siegel, Dubrovsky, Kiesler & McGuire, 1986), although this tends to refer primarily to computer conferencing and electronic mail. What is astonishing is the extent to which these streams run parallel but separate courses with little cross over.

Within the GDSS literature there are a number of different streams which differ fundamentally in the assumptions they make about the nature of reality, research questions and methodologies. These assumptions and models will be discussed, with a view to building a model of electronic group communication to incorporate cultural diversity.

Rational or functionalist models of technology adoption are dominant, and assume that media will be chosen to match the task at hand. Conceptually, this research owes much to notions of fit. Social presence theory (Short, Williams & Christie, 1976) or media richness theory (Daft & Lengel, 1986) is used to classify the media and communication requirements for the task.

The Daft and Lengel model of information processing and organization design is outlined in Figure 1. Media richness refers to the "ability of information to change understanding within a time interval" (Daft & Lengel, 1986: 560).

Figure 1: Daft & Lengel Model

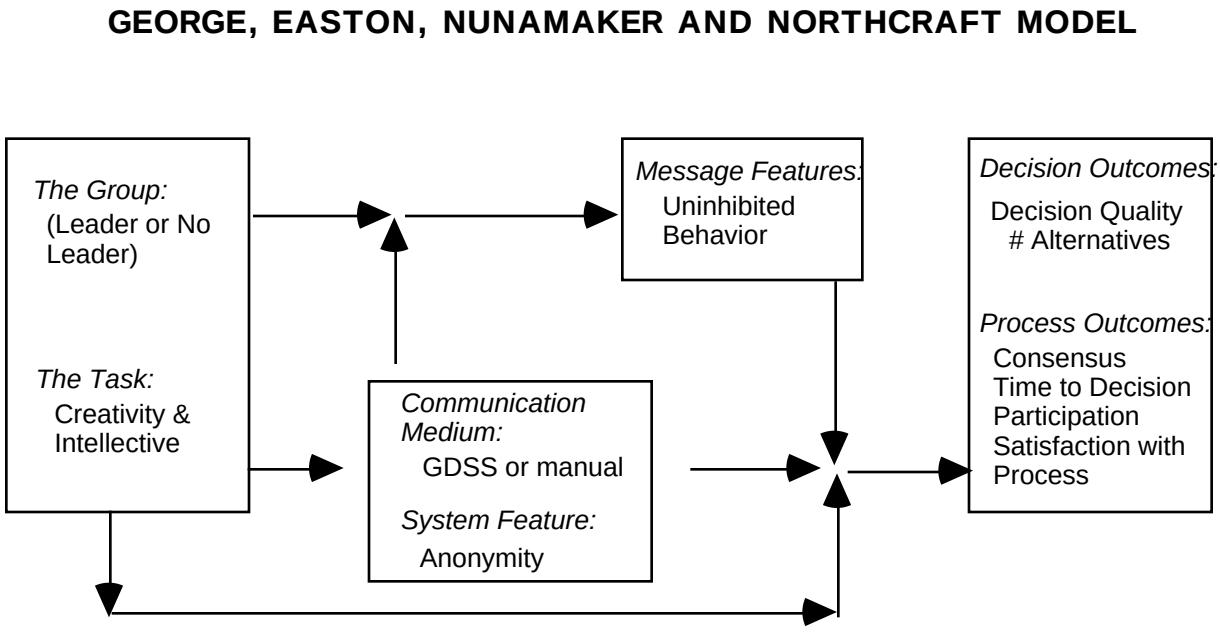


The theory suggests that rich media such as face-to-face communication or telephone are appropriate media for complex tasks requiring negotiation or conflict resolution, while less rich media, such as letters or electronic mail are more appropriate for basic information exchange. The notion of "fit" assumes that a prescription for media can be formulated based on the nature of the tasks. However, the model all but ignores the

influence of contextual variables and essentially adopts an information processing model for communication. There are several problems with this model. It assumes a passive receiver, and in matching media to a specific task the existence of a single goal is assumed. This does not allow for the role played by local context in defining meaning. It equates clarity and openness with communications effectiveness, and assumes that more richness is better, which is not always the case. Ironically, the variables that are used to define rich media - the existence of feedback, multiple cues, language variety and personal focus - parallel almost exactly the high-context communications described by Hall (1977) and Adler (1991) which, they argue, are characteristic of certain cultures. This notion, that the cultural context may influence communications requirements, even if it simply means that diverse contexts must be supported by communications media which support multiple channels of communications, holds promise for further investigation.

George, Easton, Nunamaker and Northcraft (1990) offer a model (Figure 2) which shows the influence of group and task characteristics on the decision and process outcomes. Group and task characteristics are filtered by the communication medium, affecting outcomes directly and also affecting the message features (which then affect outcomes). The model incorporates leadership by examining the effects of the GDSS on assigned leaders. It also features anonymity in sending messages. But the model is too simplistic. There are characteristics other than leadership which affect the group, and message features such as uninhibited behavior are only one dimension of the processes.

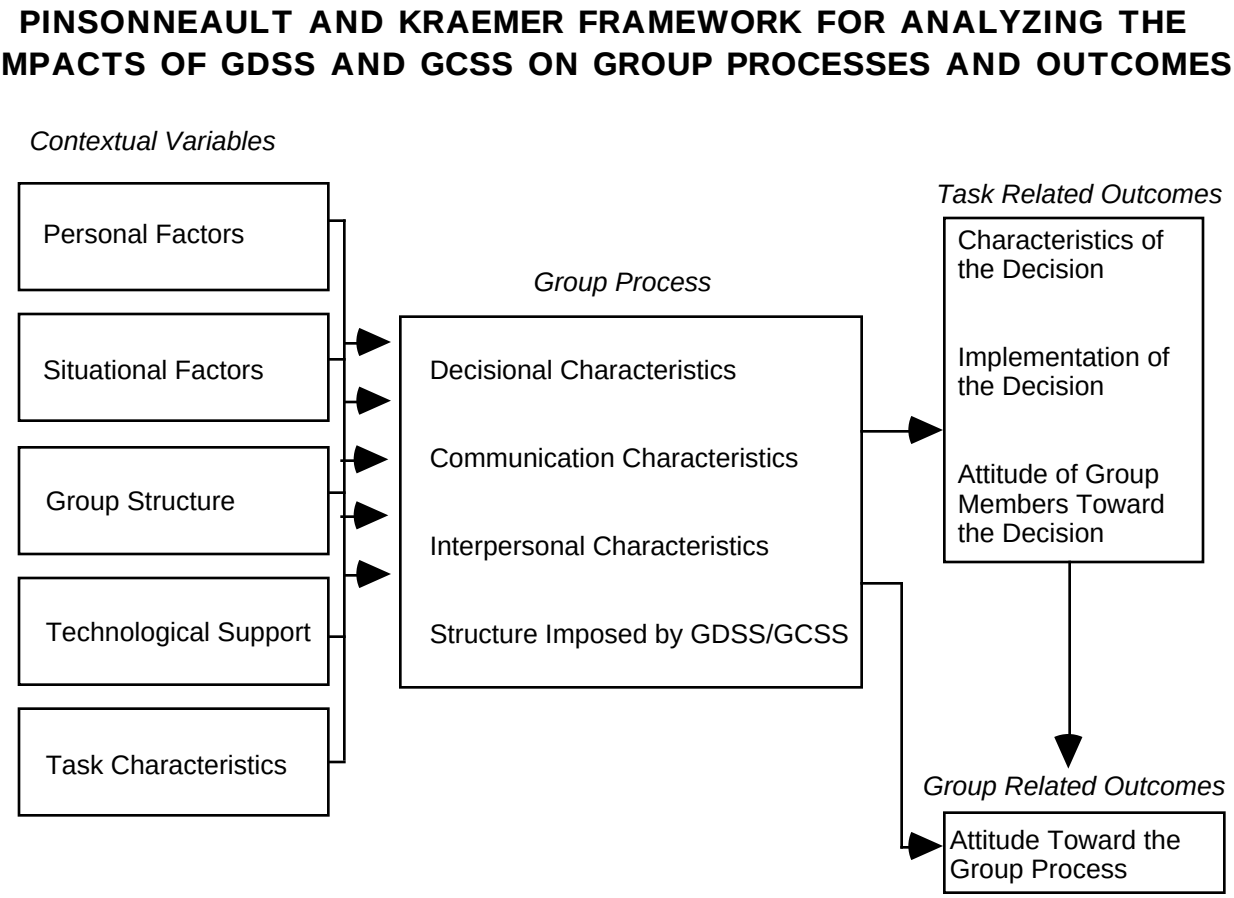
Figure 2: George, Easton, Nunamaker & Northcraft Model



Increasingly the rational models acknowledge the role of individual characteristics and contextual issues but these are treated essentially as inputs to the system which can be systematically measured, modeled and predicted. More complex models have emerged which acknowledge a wider range of variables. Pinsonneault and Kraemer (1989), for example, propose a model (Figure 3) defining contextual variables (personnel factors,

situational factors, group structure, technology and task) that affect a full range of group processes, not just decision making, and produce both task and group related outcomes.

Figure 3: Pinsonneault & Kraemer Framework



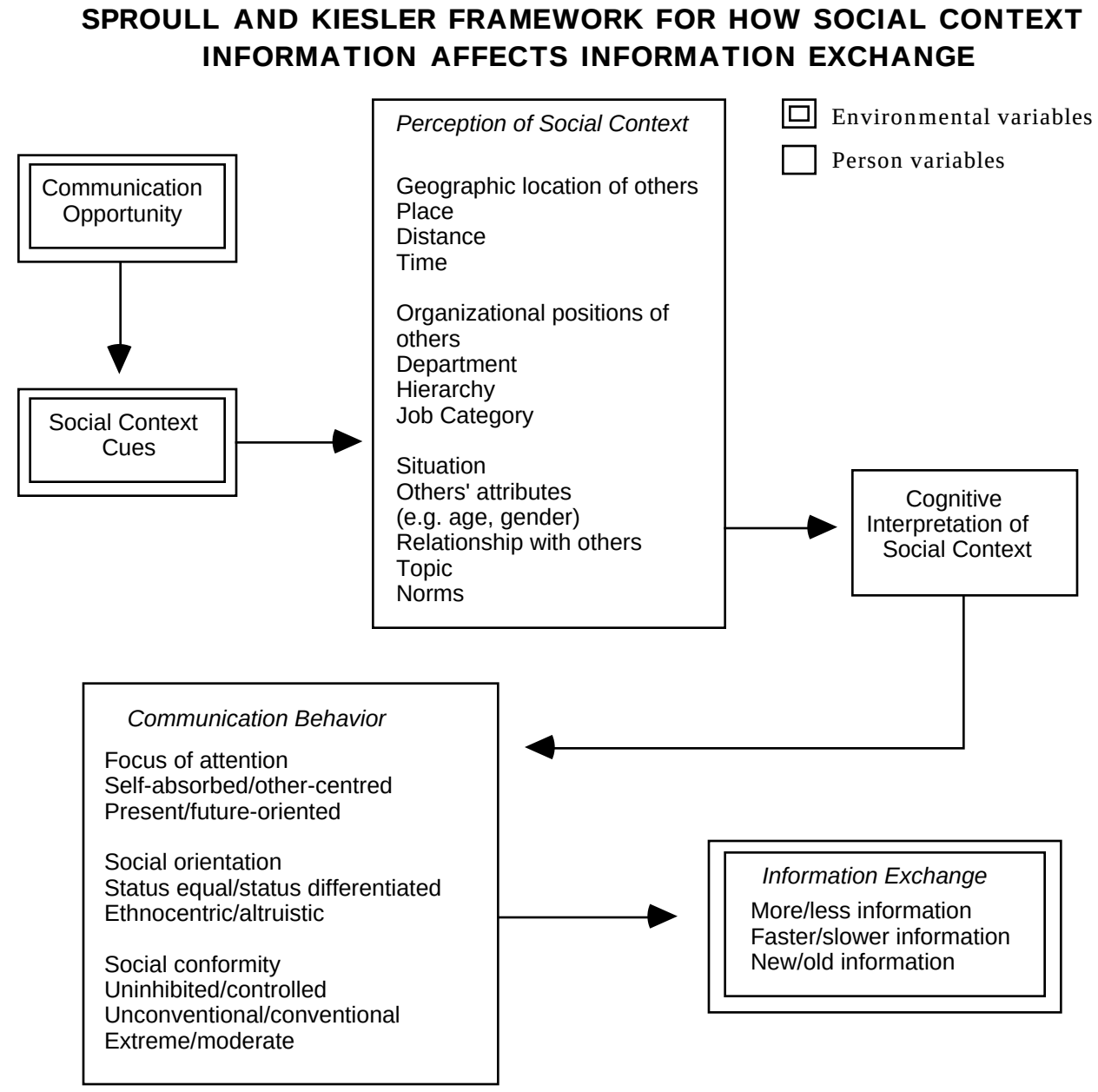
Although this model includes contextual variables, it does not express the mutual dependence of group process on contextual variables and contextual variables on group process or the iterative effects of outcome on context.

For example, group processes such as the exchange of information, non-verbal communication and task-oriented communication have a decided effect on group cohesiveness, a key contextual variable. Although there are some elements of a communication model, the basic form is input -> processing -> output, as with other models discussed to this point. This approach tends to assume that outcomes are easily defined and measured.

Nunamaker, Dennis, Valacich, Vogel and George (1991) define improved outcomes in terms of more information, synergy, more objective evaluation, simulation, and learning. Process losses, which occur when a group fails to live up to its potential (Steiner, 1966), are air time fragmentation, attenuation blocking, concentration blocking, failure to remember, conformance pressure, evaluation apprehension, free riding, cognitive inertia,

socializing, domination, information overload, coordination problems, incomplete use of information and incomplete task analysis. Even the language suggests the notion is context-free transmission of signals and is task-oriented.

Figure 4: Sproull & Kiesler Framework



Another trend in the literature is to consider group communications technologies as inseparable from the political and social contexts with which they interact. This approach is rooted in an interpretative framework and is reflected in work such as that of Weick and Meader (1993) who suggest that organizations are enacted and that information is selected and retained to construct meaning. Sproull and Kiesler (1986) made some progress in

developing a model (Figure 4) which highlights the importance of perception and interpretation in the communication process.

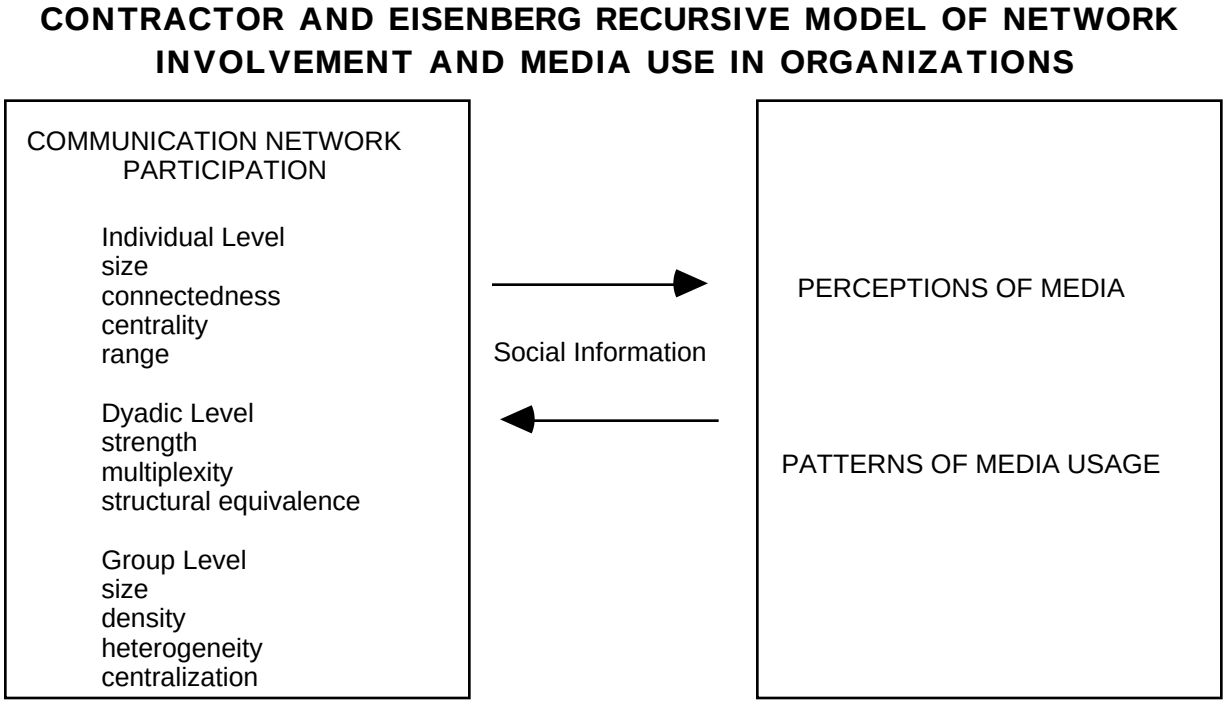
However, the model still lacks the interactions needed to express the mutual influences of context, communication and outcome. Moreover, its outcomes are defined in information exchange terms which, as already discussed, are too limiting.

Some researchers have allowed for differences in perceptions of outcomes. Rohrbaugh (1992) focuses on decision making and problem solving as well as group interaction. He identifies a range of performance standards and draws on the socio-psychological theory of group decision making in order to understand the processes of eliciting information, solving problems and making choices. Evaluating the effectiveness of group decisions is problematic either in terms of outcomes or process. The decision process cannot be evaluated on the basis of observed outcomes, as poor decision processes may produce good outcomes or vice versa. Group decision processes must be assessed on process, not outcome. Task-based theories of performance also tend to rely upon outcome measures, and do not add to the understanding of group decision processes.

Reagan & Rohrbaugh (1990) proposed the Competing Values Approach (CVA) (Lewin & Minton, 1986; Quinn & Rohrbaugh, 1981) as a multiple criteria framework with which to assess the effectiveness of group decision processes. Rohrbaugh (1987) extended the CVA matrix to provide a conceptual framework to accommodate competing values associated with the four perspectives on effective decision making. The rational (rational goal model), the political (open systems model), the consensual (human relations model) and the empirical (internal process model) perspectives each represent conflicting demands for decision making. These competing values occur at the individual, group, organization and societal levels. Lawrence & Lorsch (1967) identify these values as interpersonal orientation, structure and time. Interestingly enough, these dimensions also have corollaries in the cultural analysis.

Other researchers also explicitly challenge rational models of technology adoption, arguing that communication in organizations involves multiple goals (Contractor & Eisenberg, 1990), and that the adoption and use of media is social (Ebadi & Utterback, 1984; Fulk, Steinfield, Schmidt & Power, 1987; Kling & Scacchi, 1982 and Markus & Robey, 1988). New media are rarely adopted or used as would be logically expected (Kiesler, 1986; Rogers, 1988; Watson, DeSanctis & Poole, 1988). Contractor and Eisenberg (1990) argue for a recursive model of technology where social structure and media use interact with each other (Figure 5).

Figure 5: Contractor & Eisenberg Model



This approach emerges from structuration theory and treats technology as "cultural objects which people and groups of people can apprehend with very different descriptions and invest with different attributes" (Turkle, 1984: 320). As Contractor and Eisenberg note, social context defines what tools are available (Markus, 1987; Rice, 1988; Rogers, 1988), and how these tools are understood and enacted (Bikson, Eveland, & Gutek, 1989; Fulk, Steinfield, Schmitz & Power, 1987; Papa & Tracey, 1988). There are reciprocal relationships among goals, technology, actions and interactions (Kling & Scacchi, 1982; Weick, 1984). Emphasis is on the relationships between objects rather than on their attributes (Miller & Monge, 1985). But while the Contractor and Eisenberg model does address the recursive aspect of group electronic communications, it seems less than fully developed. For example, communications network participation and patterns of media usage are not clearly distinguished.

Synthesis

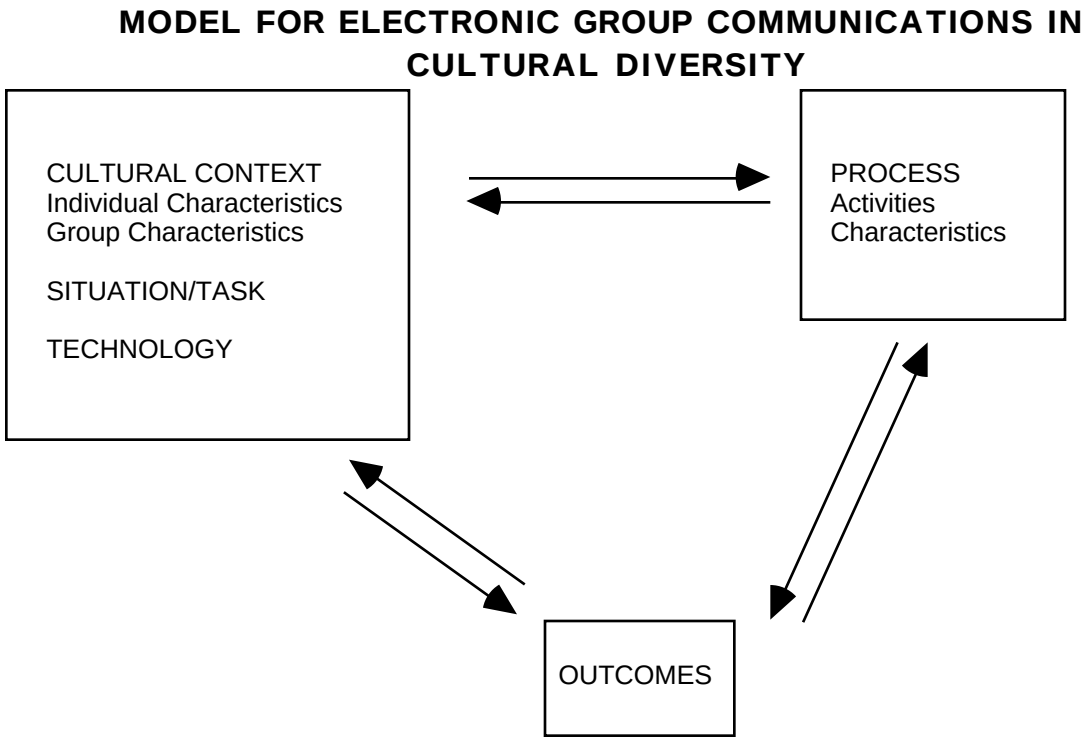
Much of the research in this stream has been conducted in North America and pays little attention to cultural issues or diversity. Often the results are based on experimental designs. For example, (Gallupe, Dennis, Cooper, Valacich, Bastianutti & Nunamaker, 1992) focus on comparing traditional and computer supported tasks in an experimental environment. While such work has value, the groups are relatively homogeneous (undergraduate students of both genders with the mean age of 19.8 years) and many of the results are inconclusive. Placing an emphasis on contextual factors in communications with a focus on cultural issues, perception and interpretation rather than on information processing may offer fresh insights.

In endeavoring to reconcile the literature on cultural diversity with the research on GDSS, we propose a model that:

1) considers the role of cultural variables in shaping context at the individual, group and task level;
2) considers the effect of these variables on the group processes;
3) considers the effect of these variables on the definition and characteristics of outcomes; and
4) recognizes the recursive nature of interactions between context and communications media and the relative unimportance of the rational choices based on the task characteristics.

The proposed model (Figure 6) builds on the ones previously reviewed. The context, the processes and the outcomes are iteratively linked. The context includes individual and group cultural context, technology and situation/task. Processes can include communications, decisions, interpersonal or other processes, and are affected not simply by the context but by the way in which contextual variables affect the interpretation of the individual, group, task and technology. Similarly, the outcomes are filtered by the

Figure 6: Model for Electronic Group Communications in Cultural Diversity



perceptions of outcomes rather than empirically defined measures. The outcomes of media use or processes necessarily affect context such as group cohesiveness. This approach frames the analysis of electronic communications media in a way that provides opportunities to explore cultural diversity. Cultural diversity clearly defines the context. It affects status relationships, and the perception and interpretation of context including elements of the group, the individual, the task and the technology. Cultural diversity also

shapes communications processes such as decision making. Finally, it influences the definition and perception of outcomes and their importance. The use of the communications medium in turn can influence the cultural context by reinforcing or eroding identification with groups, strengthening cohesiveness or intensifying conflict, and bridging or creating barriers.

Table 3: Elements of the Model for Electronic Group Communications in Cultural Diversity

CULTURAL CONTEXT VARIABLES	
Individual Characteristics	Group Characteristics
national	homogeneity/diversity
regional	cohesiveness
ethnic, religious and/or linguistic	equality/power
gender	individualism-collectivism
generational	masculinity-femininity
social class	time/space
organizational level and profession	language
affectational orientation	meaning
cognitive ability	uncertainty avoidance
physical ability	context
education	norms/values
learning	
marital status	
SITUATION/TASK VARIABLES	TECHNOLOGY VARIABLES
stage	characteristics
size	capability
time/place	flexibility
purpose	ease of use
goals/objectives/tasks	
uncertainty	
complexity	
PROCESS VARIABLES	
Activities	Characteristics
communications	depth of analysis
information sharing	participation
decision making	time to decision
management/planning	forms of communication
interpersonal interactions	domination
consensus building	conflict/cooperation
motivation/team building	conflict/avoidance
	egocentric/altruistic
	uninhibited/controlled
OUTCOME VARIABLES	
group performance	
decision quality	
efficiency (time/effort/cost)	
effectiveness	
adaptive skills	
customer service	
consensus	
satisfaction	
equity/fairness	
action	
commitment	
power consolidation/sharing	

Further Propositions

Further to the model proposed above, we speculate that cultural diversity has wide-ranging practical implications for the planning and use of electronic group communications. Some of the specific propositions which might warrant further investigation follow.

1. Electronic communications can increase rather than reduce communications barriers if the culturally determined contextual dimensions of communications are not adequately addressed. For example, in high-context cultures where visual cues are more critical, high-context or rich communications media may be more appropriate. Alternatively, recognizing diversity or individual and group communications needs might suggest that group communications systems should be designed with a high level of flexibility and a range of channels to serve diverse needs.
2. Loss of full range of communications cues can create miscommunications and conflict, and feelings of mistrust. Most people need face-to-face interaction to build trust, particularly in high-context cultures. Consequently, electronic group communications has the potential to build, as well as bridge, cross-cultural communications barriers.
3. Cultural values may affect the adoption of some technologies. For example, differences in masculinity-femininity dimensions and cultural values would affect the implementation of the acceptance of anytime-anyplace work and learning
4. Quite apart from the subtle contextual issues surrounding cross-cultural group communications, there are practical issues to consider. For example, video is better than audio for those working in a second language. People working in a second language often have a better command of the written as opposed to oral language and may be better served by text-based communication systems. This also applies to people with some physical disabilities. Physical differences must also be considered. Skin color, for example, affects the lighting and exposure requirements in photography but lighting and cameras used in most videoconferencing systems are set for Caucasian skin tones.
5. Differences in attitudes towards competitiveness and individualism may be amplified or mitigated by electronic communications. For instance, in cultures where approaches to conflict are more indirect, electronic communications may present certain barriers to understanding.
6. Differences in individualism also affect levels of participation. If participation is a desired outcome, methods to manage interactions such as polling techniques may be appropriate.
7. In consensus-oriented cultures, the voting features of some group decision support systems may be inappropriate.
8. The continuum of low-context to high-context cultures may have implications for media richness. Electronic mail systems, for example, may be less well-suited to high-context environments than other forms such as voice mail or audio teleconferencing. Within organizations, the contrasts between the contextual needs of professional cultures, for example, of engineering compared to marketing, may also influence preferences for media richness. The importance of context and interpersonal interaction also affects the learning environment.

9. The analyses of gender issues in teaching and learning, particularly science teaching and learning, have exposed gender biases in the examples used, the competitive models employed and even the language of computing which should be considered in the development of electronic group communications systems.

Conclusions

1. Cultural diversity affects the cultural context for the implementation of electronic group communications.
2. The extent to which cultural diversity affects attitudes toward and use of electronic group communications is unclear.
3. Organizations which take cultural diversity into account when implementing electronic group communications technology will be more successful than those who do not.
4. This proposed framework for analysis is a starting point only. There is a need for a broader base of interdisciplinary, empirical research. In addition, there is a need to carefully explore the meaningfulness of focusing on group versus individual characteristics, given that differences within groups are often greater than differences across groups.

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