

December 2004

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Recommended Citation

Komlodi, Anita and Carlin, Michael, "Identifying Cultural Variables in Information-Seeking" (2004). *AMCIS 2004 Proceedings*. 68.
<http://aisel.aisnet.org/amcis2004/68>

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Identifying Cultural Variables in Information-Seeking

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ABSTRACT

Information seeking (IS) and use are important user tasks supported by information systems. There is a long tradition of studying user IS behavior in electronic environments, however, the study of the impact of end-user national culture on the use of information systems to find, retrieve, and use information is very limited. This area of research is becoming more and more important as the users of many search systems (e.g., Web search engines, online database systems) access these systems from all over the world and often have to use the same user interface. However, most of the existing research simply reports differences in behavior, without examining cultural variables to identify why these differences occur. A more thorough study of the impact of culture on IS behavior will enable the designers of search systems to design interfaces more usable by users from different cultural backgrounds. In this paper, the authors explore the role of cultural dimensions of the frameworks described by Hall [3] and Hofstede [4] in IS to create a foundation for further studies on the impact of culture on searching. Potential areas of high cultural impact on IS will be identified to propose promising future research directions.

Keywords

Information seeking, cultural dimensions

INTRODUCTION

Providing information via search and browse user interfaces to end users is an important function of information systems. Online search tools (online bibliographic and full text databases, Web search engines, Web hierarchical catalogs) are truly global in their reach; searchers can come from all over the world and so can the content of the systems. While the user group can be international, the designers of these search tools are usually from one culture and the user interfaces and functionality are based on the needs of that culture. This inherent conflict can lead to serious usability problems experienced by an international user group. In order to better design search tools that serve information seekers from all over the world, we need to first understand the differences in searchers' perceptions, experiences, and patterns of behavior while searching for information.

Very few cross-cultural comparisons of IS behavior exist [1, 2, 5], our research aims to fill this gap and address the question in a novel, structured way, building on existing culture models to explore cultural differences in IS. The existing studies [1, 2, 5] compare IS behavior of various cultural groups and then explain differences by cultural traits. While these results are very valuable for understanding differences, our approach starts with existing culture models and examines the impact of these identified cultural differences on IS. This paper describes the first steps toward the application of culture models to the study of IS by identifying potential hypotheses about the impact of selected cultural dimensions on various IS steps.

RELATED RESEARCH

Very few studies looked at cultural differences in IS. Iivonnen and White [5] showed varying levels of cultural difference in IS on the Web among Finnish and American students, Duncker [1] examined the differences in searching via the online public access catalog of a library between indigenous and European New Zealanders and found significant differences in their interpretations and perceptions of the library. Both of these papers attributed

differences to various cultural differences: searching style, cognitive style, language use, perceptions of search systems [5]; and traditions of story telling and information sharing [1]. Evers [2] found differences in various culture groups' search, navigation, and user interface understanding within one website while studying differences in the use of a virtual learning environment, attributed to a set of variations in cultural characteristics.

While these studies described interesting IS behavior variations, a more generalizable understanding could be gained by first identifying what cultural dimensions may have a strong impact on IS and subsequently examine their influences more closely. In order to identify these cultural dimensions, we have examined them in the light of a model of IS behavior (Marchionini, 1995). First this model will be reviewed, then the results of the analysis on the potential impact of cultural dimensions will be reported.

INFORMATION-SEEKING TASKS MODELS

IS is a complex, problem-solving task. Several cognitive and task models of IS have been proposed to describe this behavior; for the current analysis, Marchionini's (1995) task model has been selected because of its linear main structure (with many feedback loops added) and clarity. While this model mostly represents searching, the analysis presented in the paper creates the foundation for studying browsing as well. This model provides a clear distinction of steps that can be easily related to the cultural dimensions. These steps are shown in the header row of Table 1, columns 2-8. In our analysis, the potential impact of each cultural dimension was considered on every IS step by the authors based on a thorough understanding of both IS behavior and cultural dimensions. The model starts with the identification of the information need, which involves the realization by the searcher that she needs information to solve a problem. The next step is the expression of this information need, which presupposes that the searcher can define the type of information she needs. After the information need has been expressed, a source needs to be selected where the searcher will look for the information. Once the source is selected, the information need can be expressed in a form that the source understands, for a Web search engine this can be a series of keywords. The query is executed next via entering the query into the system, results are returned by the system and examined and interpreted by the searcher. From the returned documents, the searcher selects and saves important information and when the information need is satisfied the process ends. While this is a highly abstract model of IS, it will help us examine the potential cultural impacts on the process. It is recognized that selecting a North American task model to describe IS is in itself culturally biased, however, this is practical for the hypotheses generation stage and the definition of an IS task will be kept open and flexible in future studies building on the findings of this analysis.

CULTURAL DIMENSIONS IMPACTING INFORMATION SEEKING

In the areas of cross-cultural communication and cultural anthropology there have been many cultural dimensions defined. These dimensions impact IS and information use behaviors to varying extents. In order to understand the impact of culture on IS behavior, the specific cultural dimensions that may impact this behavior should be isolated. The models of two of the most influential cross-cultural researchers have been selected for analysis, Hall's (1976) and Hofstede's (2001) culture models. Not all dimensions described by these authors were examined, a preliminary selection was carried out to only consider those dimensions that are highly likely to influence IS. Table 1 summarizes the results of our analysis.

	Info Need ID	Info Need Expression	Source Selection	Query Formulation	Query Execution	Examine, Interpret	Extract Information	Reflect, Stop	Other IS Areas
Hall:									
Message velocity continuum	S					S		S	
Context		S		S		S			
Time concept				W	W		W	W	W: Search, task techniques
Information flow									S: Expectations of info access
Action chains				S	S		S	S	S: Search, task techniques
Hofstede:									
Power distance			S						S: Expectations of info access
Collectivism/Individualism	S								S: Search, task techniques
Femininity/Masculinity			W						W: Search, task techniques
Uncertainty avoidance	S	S		S	S				S: Search, task techniques

Table 1. Cultural dimensions and IS steps. S: strong impact, W: weak impact.

The Impact of Hall’s Cultural Dimensions on IS

First, five dimensions described Hall (1976) will be reviewed. One of Hall’s most important cultural dimension, that of space, will not be discussed as it promises to be low impact on IS, limited to the physical organization of information spaces. The rest of the dimensions are examined next.

Speed of Messages describes Hall’s message velocity continuum which looks at the speed at which people of various cultures decode and react to messages. Some cultures are more comfortable with fast paced messages while others are more comfortable with slow messages. This dimension will necessarily influence the user’s interaction with the system, but will also **strongly** influence the IS process. The amount and speed of information deemed acceptable by different cultures can vary based on this characteristic. A searcher from a culture that is comfortable with slow message speeds may not identify information needs at the same speed as searchers from cultures with fast message speeds. He may also interpret results differently. He may require less information presented on a screen and will expect messages and information presented and communicated at a slower speed.

High Context vs. Low Context is a dimension that examines how much information is conveyed merely by the circumstance of a given situation. A *High Context* culture places more emphasis on the unspoken meaning of a given situation, very little of the information is in the actual transmitted message. A *Low Context* culture places much more importance in an explicit message being transmitted. This dimension will have a **strong** impact on IS, as different cultures will express information needs in varying detail depending on how reliant they are on information contained in the context. This may also influence the expression of the information need in a query, as more or less detail can be added to the query depending on how much information is usually encoded in a message in a given culture and how much of it is assumed in the context. Searchers interpret results in light of their expectations of how the information is expressed: if the user is from a low context culture where most of the information is embedded in the message, he will expect information in this communication form and he may have difficulties interpreting information that is expressed in a high-context message.

Time concepts vary greatly from culture to culture. Hall identifies two concepts of time. *Polychronic Time* consists of multiple things going on at once. *Monochronic Time* consists of one thing at a time and is linear in nature. Time orientation will influence task execution the most. How searchers structure and execute tasks, how many activities they work on at the same time, and how they time the commencement and conclusion of their tasks will all be influenced, as in the case of all human tasks. Polychronic time concepts may lead to the execution of several searches at the same time, higher proportions of tangential searching, more instances of “information encountering” (accidental location of useful information). Monochronic time concepts can result in more focused searching and less adventuring, which can lead to fewer accidental finds.

Action Chains are a sequence of events that are necessary to lead to the accomplishment of a goal. Cultures vary in the degree to which members are committed to complete an action chain in a certain amount of time and in a certain order. This dimension is strongly linked to the Time dimensions and it will most likely have a similar **strong** impact on the structuring and execution of search tasks.

Information Flow addresses how long it takes a message which is intended to produce a given effect to travel through an organization and produce the desired effect. Hall’s research shows that high-context cultures tend to have very fast information flow while low-context cultures tend to be much slower. This dimension will have a **strong** impact on expectations of the speed of information and ease of access to information. Cultures with fast information flow will expect easy access to information, while slower information flow cultures may have higher tolerance for slow information transfers and more structured access to information.

The Impact of Hofstede’s Cultural Dimensions on IS

Hofstede developed a cultural model consisting of five dimensions that seek to differentiate culture. The short-term vs. long-term orientation dimension was excluded from our analysis.

Power Distance addresses how people perceive equality, or inequality, between peoples of a particular nation or culture. A *Low Power Distance* society tends to be considerably more open to challenging of the status quo or superiors. The *High Power Distance* society tends to support inequality within the society. Power distance differences between cultures will **strongly** influence the first few steps of the IS task. Source selection will be very much influenced by this dimension, as searchers from more hierarchical societies will be less likely to go to supervisors for information and will more likely rely on sources where they do not have to cross lines of power. Access to information in these cultures can also be more limited and based on power positions.

Individualism vs. Collectivism centers on the degree to which individuals have ties to others around them. It addresses whether a society supports individual or collective accomplishment and relationships. In a *Collectivist* society people view themselves as part of a group where all members contribute to the greater good. This dimension will **strongly** influence the types of information needs, as related to user goal orientation. It may also influence the search techniques used, collectivist cultures may orient towards collaborative IS solutions, while individualistic cultures toward individual tactics. Searchers in collectivist cultures may prefer to share information more and seek information from others before accessing computerized systems.

Femininity vs. Masculinity focuses on the degree the society reinforces, or does not reinforce, the traditional masculine work values of achievement, control, and power or focuses on traditionally female values such as family, quality of life, and collaboration. While this dimension is not anticipated to strongly influence IS behavior, cooperation as a value may increase collaboration and sharing in IS and thus influence search and task techniques and source selection.

Uncertainty Avoidance focuses on the level of tolerance for uncertainty and vagueness within the society. A country with a *Strong Uncertainty Avoidance* level has little tolerance for uncertainty and ambiguity. A *Weak Uncertainty Avoidance* level indicates a society that is less concerned with uncertainty and ambiguity. This dimension will have a **strong** impact on the definition and expression of information needs and the formulation and execution of IS tasks. Cultures with high uncertainty avoidance will most likely produce information seekers with frequent information needs who may be better able to define and express their information needs.

FUTURE RESEARCH

The analysis presented in this paper proposes promising avenues of research in examining the impact of culture on IS behavior. The most promising cultural dimensions identified in the analysis are:

- Hall's speed of messages, high and low context, and information flow dimensions, and action chains;
- Hofstede's power distance, individualism/collectivism dimensions, and uncertainty avoidance.

While the North American information-seeking task models were very useful in identifying potentially high impact cultural variables, they will not be applied in the next steps of data gathering to avoid cultural bias. Instead, for each culture included in the study, an analysis of existing descriptions of information-seeking behavior in the country will be carried out. In addition, qualitative research methods and the grounded theory approach will be applied to develop a theory of behavior from the data and not allow information-seeking task models from a different culture to influence the model developed for the country.

In future phases of this study, approximately four to six cultures ranking high and low along these dimensions will be selected and studied. Information seekers from each country will be interviewed about their IS behavior in everyday information-seeking situations. Qualitative methodologies allow for the examination of unknown factors and relationships without having to define these in advance. A series of in-context interviews and observations of the participants will allow the unbiased exploration of IS behavior to discover patterns and themes that are potentially significantly different from North American IS behavior and its abstraction. The resulting descriptions will allow a comparison of IS behavior across cultures based on the initial analysis of cultural factors.

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