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BRIDGING THE GAP

Issues in The Design of Computer User Interfaces for Multicultural Communities

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Abstract: The design of computer user interfaces for multicultural groups presents a challenge to interface designers. This paper examines some of the key psychological aspects such as language, locus of control, symbolism and individual cultural characteristics that could possibly influence the human computer encounter of such groups. The results of a study done on two groups of students from multicultural backgrounds to determine differences due to cultural factors when using computer interfaces are discussed.

Introduction

The phenomenal growth of the Internet over the past few years presents exiting opportunities for global communications. The multicultural nature of the participants in the communication process poses a unique challenge to interface designers. The process of designing interfaces to accommodate a wide range of users involves three steps (Egan, 1988). The first step is to determine user differences to find out which user characteristics predict differences in overall performance. The next step is to isolate the source of variation in a particular task, and the final step is to redesign the interface to accommodate the differences among users. The determination of the sources of variation is not an easy task in a multicultural society due to the high variation in user characteristics caused by the different cultural backgrounds of the users, and the difficulty in finding the right user samples. Few studies produced results that can be applied in practice as behavioural studies tend to produce descriptive results rather than prescriptions for interface design.

This paper discusses some of the cultural issues that could influence the human computer encounter in the multicultural global community.

Communication

For behaviour to be perceived as a message it must be observed by someone, and it must elicit meaning. The meanings and interpretations of these messages depends on how the participants perceive the message, and this perception is dependent on the participants' cultural backgrounds that provide the framework within which messages are encoded and decoded. Culture therefore plays an important role in communication. The output from a computer screen can be seen as the behaviour of one participant in a communication process, and could elicit perceptions related to the cultural background of the computer user. It is therefore important to look at the issues that give shape to the cultural background of the computer user.

Language

Language is an important determining factor of the effectiveness of a user interface and studies have shown that simple translation will increase productivity of users of commercial systems (Bodley, 1993). However this is only possible in a limited number of cases as not all languages found in multicultural societies contain the necessary technical vocabulary. As the vocabulary of the interface designer is often also quite different from that of the users, care must be taken to prevent a situation where the user cannot understand the interface properly. It has been found that the different types of speech used by mothers from different social class groups have an effect on the linguistic ability of their children. Lower-class mothers typically use a limited code while middle-class mothers use an elaborated code when communicating with their children. The more complex codes could enable older children to be more oriented towards abstractions and generalizations. Lower-class children might think more in concrete and less conceptual terms (Mussen et al., 1984). This intracultural difference between users could therefore be expected to have an influence on human-computer interaction, particularly where a high degree of abstraction is used, which is more often than not the case in graphical interfaces.

Locus of Control

Locus of control refers to a person's beliefs about control over life events. People who feel personally responsible for the things that happen to them are said to have an internal locus of control while others who feel that their outcomes in life are determined by forces beyond their control are classified as having an external locus of control. This factor can influence the user's

encounter with the computer. An external locus of control is common among racial minorities and other disadvantaged groups (Baron and Byrne, 1984) due to the high degree of rejection, hostile control and criticism they experience. It might be hypothesized that a user from a cultural group with an external locus of control might have difficulties when using a computer, due to a fear of failure and rejection. Users have perceptions of their own ability to execute tasks and also an estimation of the risks and costs of mistakes, which in turn affects their self-esteem and confidence. The sense of being out of control is largely associated with the inclination to avoid such stressful situations, while the user with an internal locus of control may perceive himself to have more control over the situation and therefore be more willing to experiment. The design of the interface must therefore aim to instil in the user a feeling of being in control by being easy to understand and by using a menu structure that does not hide the underlying structure of the system.

Symbolism

Non-verbal language forms a very important part of communication (Baruth and Manning, 1991). Cultures could be seen as systems of shared symbols and meanings. Culture is communicated by symbols that give expression to the specific way in which a specific community sees and understands the world (Casson, 1981). A symbol can be defined as a sensory perceivable sign applied psychologically or mentally by a person to represent an abstract idea or a less perceivable object. As non-verbal behaviour patterns are distinctly different from culture to culture, it follows that screen displays, especially when of a symbolic nature, could be interpreted in many different ways by users of different cultures.

The use of icons constitutes an important aspect of computer interfaces, because the graphical representation allows abstract entities to be displayed as “real” objects that can be manipulated by the user. Whereas it is easy to display objects that are visual by nature, such as text or graphic objects, abstract objects, like files or functions like “copy” or “delete”, are more difficult to portray because there are no familiar symbols that correspond to the meaning of the concept.

Icons can be classified by their form, type and colour. The form of an icon can portray certain characteristics of the object or suggest some cognitive characteristics of the task. Colour connotations vary strongly among different kinds of users, especially from different cultures (Marcus, 1995). The use of colour therefore requires a careful study of the background of users of the system.

Man's background, history and knowledge are embodied in his "cognitive schemata" and capacity for metaphorical thinking. The appropriate choice of visual representation is thus a key determinant of the success of a user interface.

Individual Characteristics

As most episodes of human-computer interaction take place on the level of the individual, it is necessary to obtain an understanding of the individual's culture and how the individual relates to it. One may assume that a user shares cultural characteristics with other users from the same cultural group, but intracultural or individual differences must also be recognized in interface design. It has been found that individual differences could account for performance differences on the order of 20:1 for certain computer based tasks (Egan, 1988).

The main elements of the individual's cultural identity are ethnicity, social class, gender and generational or lifespan differences. Each user simultaneously has an ethnic identity, a socio-economic class identity and a gender identity (Baruth and Manning, 1991). Race is based on the anthropological concept used to classify people according to physical characteristics such as skin and eye colour. Cultural groups seldom correspond with racial categories, at least not to the extent necessary to provide information that is culturally relevant. A person's race does not, for example, reveal his nationality, language or religion (Baruth and Manning, 1991). Race can therefore not be considered as an influencing factor when designing user interfaces.

ETHNICITY

Ethnicity refers to group values, beliefs, behaviours, language, culture and ways of thinking. The difference in values and thinking styles between groups affects what one person finds valuable in an interface and what others do not even notice (Kim, 1995).

SOCIAL CLASS

Social class differences play a significant role in determining how a person acts, thinks and relates to others. Such differences may sometimes be more pronounced than those resulting from cultural diversity (Baruth and Manning, 1991).

The restricted language code used by mothers from lower classes when talking to their children, might impair the orientation of the child towards abstraction and generalizations (Mussen et al., 1984), two important aspects of computer usage.

GENDER

The typical organization of the workplace has caused women to play a lesser role in the adoption of computerization. In 1993 less than 30% of American computer workers were women. This will obviously lead to a lesser degree of experience by women. Even the dramatic improvement in office technologies has not evened out the difference in experience between genders as female computer users are more likely to be clerks or typists doing simple repetitive work such as payroll, wordprocessing or airline reservations (Kling, 1995).

Males and females also show unique orientations towards problem solving and different behaviour patterns between sexes can have a major influence on human-computer dialogue. This is particularly true in the indigenous cultures where a strong differentiation between the sexes is often found.

AGE

When the age of adult users varies and experiential variables are controlled, age was found to be a powerful predictor of how difficult users will find it to learn a complex computer system (Egan, 1988). A possible cause for this finding is that users differ with respect to their lifespan stage. Each lifespan stage has its unique developmental characteristics that are often closely intertwined with the cultural characteristics of the user (Baruth and Manning, 1991).

An example of such a generational difference is the ability to speak the English language. Older generations might have lived in cultures with others speaking native languages, while younger generations who can communicate effectively in English are better able to cope in a predominantly English society.

Empirical Studies

Due to the subjective nature of cultural factors, complex test instruments are needed to determine the influence of each factor and even if a factor is found to be an important one, the finding does not necessarily apply to all users of a particular system. Few, if any, studies address the problem of interface design for a wide cultural mix. Existing guidelines mostly assume a specific cultural group as the target, and base the design upon this assumption.

A study done on a group of South African students representing eight cultural groups and six languages using simple text based interfaces has revealed major performance differences between the cultural as well as the different language groups. It is expected that further studies using graphical interfaces will reveal even more pronounced differences.

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