Cross Cultural Computer Gaming

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Abstract. Computer game development is a rapidly growing global business. However, research in the understanding of the global user is lacking. This paper presents a survey of recent research on cross cultural game development. The paper proposes a cross cultural hybrid model to carry out user modeling to assist developers in understanding the cultural nuances of end users.

1 Introduction

Computer games are being played by an increasing global population. However, little research has been conducted to understand the cultural backgrounds of the end users. Software developers use creative programming techniques and tools to develop games with hopes of successful market penetration. It is the purpose of this study to discuss the effectiveness of hybrid cultural models in computer game development.

2 Background

Research has shown that user modeling studies can lead to effective software design [22]. The increasing appeal of computer games to a global audience dictates that user modeling must be carried out with an understanding of the targeted international culture. It is no longer sufficient to develop games in one culture and expect success in another environment. To account for this globalization process, software developers need to understand that simply accounting for language translation of their games for different countries and cultures in which they operate is not sufficient [3]. Developers must exhibit sensitivity for the nuances that exist in all cultures if their games are to be successful in gaining acceptance in the domestic markets. Indeed, today's developers must be charged with the task to think globally but act locally. The problem posed to researchers and developers alike is to identify a set of universally accepted design guidelines that are useful to developers in deigning games for a cross cultural audience [36, 28]. The importance of culturally appropriate interface design for gaming applications is emphasized by many researchers [15, 9, 20, 3, 27].

2.1 Culture

The majority of researchers in the cross cultural domain acknowledge the cultural model of Geert Hofstede [14] and use it to explain their findings. Hofstede's model of

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cultural dimensions is derived from a factorial analysis of over 116,000 international personnel at IBM from 1967 - 1970. His questionnaire on work-related values related to universal aspects of social relationships collected data from subjects from 72 nationalities and in over 20 languages. As a result of this research he derived five different macro-cultural level cultural dimensions. They are Power distance, Uncertainty avoidance, Masculinity vs. Femininity, Individualism vs. Collectivism, and Time Orientation. Based on the results of the compiled data, Hofstede came up with a score for each nationality or culture. In each case, a high score refers to a higher value of that cultural dimension.

Using Hofstede's work as a template, researchers have analyzed cultural variables to help developers design culturally attuned products. Nielsen proposed a set of culturally relevant heuristics that are applicable in some product designs [23]. Marcus and Gould used Hofstede's cultural dimension model to propose a set of examples of website designs [21]. Other prominent works include those of Kaplan and Triandis. Kaplan researched the correlation between language and thought pattern and proposed several types of patterns, namely Linear, Semitic and Oriental [17]. Triandis carried out extensive research on Individualism and Collectivism and proposed a methodology to measure these cultural attributes [34].

The literature revealed extensive sets of cross-cultural studies where the researchers studied one or more cultural attributes using one or more different cultures. However, little research has been conducted on the use of hybrid cross-cultural models. Khaslavsky carried out one of the few hybrid studies. She selected cultural dimensions from the works of Halls, Hofstede and Trompenaars to come up with a model to study similarities and differences in the usability of interfaces between American and French users [13, 14, 18, 35].

This paper proposes an extension of the efforts of Khaslavsky by combining the most common variables studied by researchers into a hybrid model. The following variables have been found to be the most widely researched in the cross cultural domain: Color, Symbolism, Individuality, Knowledge Processing and Local Variables. Research into color and symbolism is quite extensive [16, 21, 25, 31]. Using this research, the color and symbolism choices were made. Marcus provides examples of images that are representative of individualism and collectivism [21]. Kaplan's research into Language and Thought patterns provides the framework for the selection of this factor [17]. The literature is abounding with examples of research into the necessity of understanding countless other local variables. Such is the diverse nature of local variables that the collection of an exhaustive list would prove very difficult given the number of global cultures [1, 2, 4, 8, 16, 20, 25, 30, 37]. However, the several local variables are repeated quite often. As a result, these variables were chosen as part of the preliminary study. These include: date and time format as well as local language.

3 Cultural User Modeling

To assist game developers in their understanding of culture, we propose the following cross cultural hybrid model

3.1 Symbolism

Through their respective studies, Cook [6], Fussell and Haaland [12], Marcus [19] and Piamontea et al. [24] have reported that not all messages mean the same thing in different cultures. Some cultures may not recognize or associate an image or symbol in interface design as the designers had intended. To enhance cross cultural sensitivity images or symbols must be carefully selected and designed with the target culture in mind. Designers must be educated and made aware of expected differences among cultures to recognize potentially sensitive images that are culturally specific and isolate them during the internationalization process [20]. It is recommended that designers work with international experts to determine whether images in a product are non offensive and universally recognized and understood [9]. If images are not likely to be recognized or may cause offense in the target culture, they must be isolated during the internationalization process.

3.2 Local Variables

One of the first steps in the preparation of entering a product into an international market is the issue of translation of all interface text into the local language. This can be a very complicated task as the translation must make accommodations for issues such as computer-human interaction [11]. This problem can be further accentuated if the interface developers are unaware of the language specifications of the target culture [33]. To avoid problems of this nature, developers and translators need to collaborate closely and familiarize themselves with the application domain. Having a working knowledge of human factors principles such as screen layout and the design of interactive behavior would be of further assistance [30]. The following checklist can be applied:

- Avoid Jargon
- Be careful of words that do not exist
- Carefully chose product names to avoid embarrassing translations
- Be mindful of text flow directions and character sets
- Use appropriate date, time and number notation formats

3.3 Individualism

Triandis [34] has carried out a very detailed study of Individualism and Collectivism. He defines Individualism "as a social pattern that consists of loosely linked individuals who view themselves as independent of collectives; are primarily motivated by their own preferences, needs, rights, and they contracts they have established with others; give priority to their personal goals over the goals of others; and emphasize the rational analysis of the advantages and disadvantages to associating with others" [34].

Triandis defines Collectivism as "a social pattern consisting of closely linked individuals who see themselves as parts of one or more collectives (family, co-worker, tribe, nation); are primarily motivated by the norms of, and duties imposed by, those collectives; are willing to give priority to the goals of these collectives over their personal goals; and emphasize their connectedness to the members of these collectives."

Individualism and Collectivism are difficult to measure as these terms are used by many people in different parts of the world and are given various meanings, they can be difficult to measure[34]. However, researchers such as Marcus [20] and Sheppard and Scholtz [26] have demonstrated the individualistic and collectivistic cultures through the use of cultural markers. Examples of these markers, found in cultures known to be individualistic or collectivistic according to Hofstede [14], were found in the design and layout of popular websites of these countries.

3.4 Color

What color represents and how it is interpreted varies greatly across cultures [31]. For example, Courtney [7] has found that while the color red is generally associated with danger in the U.S., it represents happiness in China. Similarly, the author reports that while the color yellow is generally used to refer to cowardice, it is viewed as a reflection of prosperity in Egypt.

3.5 Knowledge Processing

The works of Kaplan [17] have highlighted the differences in language and the thought pattern. Kaplan's study reports several types of thinking patterns namely linear, circular, parallel and random. Kaplan attributes the differences in these language styles to cultural variations. Differences in cognition and thinking styles have resulted in numerous misunderstandings. Understanding different culture's approach to cognition and problem solving can be challenging [36]. The complications in communication are furthered when hand gestures and non-verbal cues are taken into consideration [32].

4 Conclusions

The understanding and application of cultural variables can play a significant role in assisting software developers. By applying a culturally sensitive approach, game designers will no longer have to make assumptions of users. This paper proposes a new direction of research in the field of computer game design using a cross cultural hybrid model.

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