

An Initial Cross-Cultural Survey of User Perception on Web Icon Design for Travel Websites

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Abstract: The increasing technological sophistication in many countries and the resulting broader world communication through the World Wide Web (WWW) imply greater attention to the international aspects of user interfaces. Consequently presenting appropriate and understandable World Wide Web interfaces is a challenge due to a broadly different beliefs, attitudes, and values. No matter how sophisticated every visual representation is, the language and cultural differences will still remain in the user perception. As result, one cannot trust the original usability work on the user interface to be necessarily and equally usable around the world. Based upon this notion, the universal capabilities of interface design for the World Wide Web is questionable. This initial research attempted to identify whether or not perceptual differences occurred when subjects from two culturally different populations viewed similar web interfaces, in which web icon on web-based travel sites was chosen as stimuli. Study was taken at two different locations, the Design Department at Institute of Technology – Bandung Indonesia and the School of Design at Arizona State University – USA. Given the web icon designs and their referential function, subjects were asked to order, for each referent, a set of web icons in descending order of merit to the appropriateness of their referent. The rationale for this research was based on Edward T Hall's theory of culture as applied for computer-mediated-communication. As for analysis, the perceptual score was determined by totaling the scores of the most meaningful icon for each referent that were chosen by users. Thirty college students participated in the survey. The subjects were grouped according to genders, age groups, university-standings, and computer-literacy level. Result showed that the perception of Indonesian users and American users was significantly different. The differences between populations occurred in three factors of icon design: message type or information, message speed, and object presentation. The study also indicated that these differences were mostly influenced by gender differences in the American population samples. Other measured variables, such as age groups, university-standings, and computer-literacy levels did not have significant effects on the perceptual differences between populations. As an initial study, this research aimed to address cultural issues in interface design research yet providing guide points for further study on cross-cultural visual communication.

Keywords: *Web icon design, User interface design, User perception*

1. Introduction

The increasing technological sophistication in many countries and the resulting broader world communication through the World Wide Web (WWW) imply greater attention to international aspects of user interface. Presenting appropriate and understandable World Wide Web interfaces is a challenge due to broadly different beliefs, attitudes,

and values. Common misunderstandings that occur in human interactions are often magnified by the wider differences in adopting visual representations presented by Web interfaces.

No matter how sophisticated every visual representation is, the language and cultural differences will still remain in the user perception [1]. These differences affect user perception, and therefore a visual interface that was designed and developed in one culture but used in another, has a high probability to become a “new” interface [1]. As result, one cannot trust the original usability work on the user interface to be necessarily and equally usable around the world. For example, the blue mailbox on AOL (America Online) interface that is commonly used as representative icon for electronic message exchange in North America can become unrecognizable, to most people outside North America, because it is not common.

Previous research [1-3] suggests that what is meaningful and natural for one group may be ambiguous, unintelligible, and arbitrary for another group. Therefore, a concept for internationally used interface design should not force acclimatization to override existing differences [1]. Based upon these notions, the universal capabilities of interface design for the World Wide Web is questionable. Although a great deal of research already exists in the interface design process, usability, and the involvement of culture in interface design [1-4], very little research exists in internationally used interface design, especially user perception of web icons, and more so in the comparison of two culturally different user populations related to Indonesia. Therefore, this study sets the goal to identify Indonesian user perception when adopting similar web icons by comparing them to the American populations. More specific objectives are listed as follows:

- To identify the perception of Indonesian users when adopting web icons
- To compare the perception of Indonesian users with the American users when adopting to similar web icons
- To identify the differences and similarities of perception between both populations.

2. Theoretical Framework

In order to achieve the goal effectively, the structure of study consists of two major parts. One is to understand basic theoretical framework regarding icon design and cultural model, and the other is to observe user’s perception when adapting similar web icon’s design. Having done two parts of study, a means to identify the perception of users can be available by cross-tabulating aspects of culturally affected communication with user’s perception data. The rationale of this approach comes from Edward T. Hall’s theory of culture.

Edward T. Hall’ sees culture as a ‘program of behavior’ [6] noting that effective cross-cultural communication has more to do with releasing the right response than with sending the “right” messages. Therefore, in Hall’s theory, the dimensions of culture consist of four aspects, and they are:

- *Speed of messages.* Hall talks about the message ‘velocity continuum,’ which refers to the speed with which people decode and act on messages. According to Hall, some cultures tend to use fast messages (for example, headlines, cartoons, propaganda, TV commercials, and so forth), while others are more comfortable with slow messages (for example, works of arts, poetry, deep relationships, and so forth).

- *Context.* Hall articulates the idea of high and low context that refers to the amount of information given in the communication. A high-context communication is one where most of the meaning is in the context, while very little is in the transmitted message. A low-context communication is one where most of the meaning is in the transmitted message. Nancy Hoft [5] in her interpretation on Edward T. Hall's *Context Square* and David A. Victor's *Context of Ranking Cultures*, explains that in high context culture information is implicitly stated while in low context culture information is explicitly stated. She interprets Hall's theory in the context square (see below)

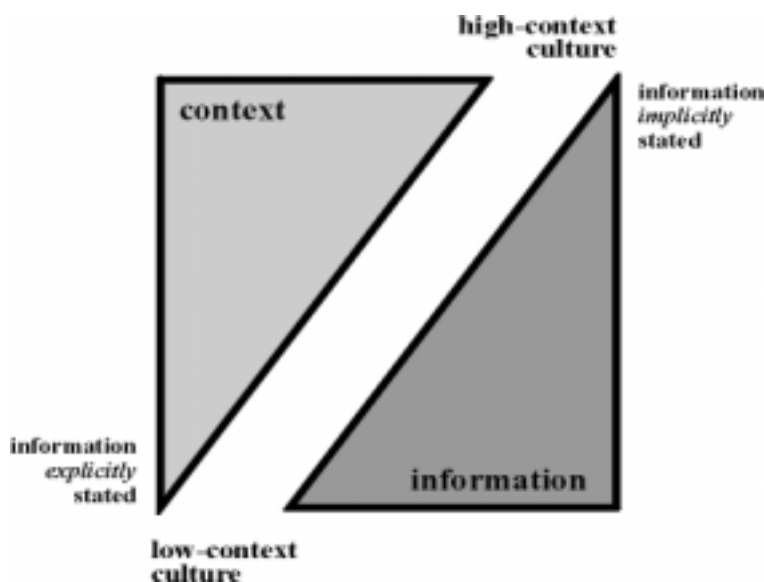


Fig 1. Context Square of Low – High Culture

- *Space.* Hall notes that all cultures have difference senses of spaces, or invisible boundaries. Hall qualifies these invisible boundaries into:
 - Territoriality.* This cultural trait includes ‘ownership’ and extends to communicate power
 - Personal space.* Cultures have different expectations of personal space and therefore have unspoken and unconscious rules when personal space is violated
 - Multisensory space.* Cultures have unconscious rules about what is too loud and intrusive
 - Unconscious reactions to spatial differences.* The distance kept during conversation can influence the response a person has to the speaker and to the conversation
- *Time.* Time is an important and complex dimension of cultures in Hall's model. It consists of two types:
 - Polychronic time (P-time)* is characterized as simultaneous and concurrent. ‘Many-things-at-once’ is a description for P-time
 - Monochronic time (M-time)* is characterized as being sequential and linear. ‘One-thing-at-a-time’ is a description for M-time

This theoretical model of culture tells that complete understanding of culture requires one to look at not only surface levels of observable culture but also bottom levels of unconscious culture. This reciprocal aspect of culture requires ‘interpretive’ approach in researching culture, and therefore, Edward T. Hall’s theory is suitable for understanding cultural characteristics and interpreting the background of specific pattern on observed perception.

3. Method

For study, a set of web icons was retrieved from five well-known travel websites from a list of 100 hotspots (100 hotspots ranks, www.100hot.com). Based on Satalkar’s explanation [12], the chosen icons were categorized as content-representational icons in which users “directed” to certain department or unit of interest. These content-representational icons were presented to users at two different locations, in the United States and in Indonesia. As a case for study, the travel web site was chosen due to its convenient and accessible link, and because it has emerged as the highest growing on-line business.

This initial research employed a cross-cultural survey, aimed to study and compare members of “two different culture groups who speak different languages and who were governed by different political units that might lead to significant differences in behavior” [7]. The sampling was a non-probability convenience sample consisting of accessible and cooperative college students in the target locations at the time of data collection. Fifteen college students at each location comprised the sample.

The instrument was the adaptation of an International Standard Organization (ISO) appropriateness ranking procedure used to determine the understandability or meaningfulness of symbols [8-11]. A total of thirty icons representing five referents for travel/tourism websites were tested. They are *AOL travel*, *MSN Expedia*, *Uniglobe Travel*, *The Trip*, and *Yahoo Travel*. Each set of icons was carefully chosen and developed so that they would represent a different nature of icon design. A survey of common usage referents for travel websites provided the referent terminology. They were *flight reservations*, *car rentals*, *accommodations or hotel reservations*, *vacation packages*, and *special vacation offers*.

Table 1. Referents and function of icons

Referent	Function
Flight Reservation	To reserve and purchase an airplane ticket
Car Rental	To reserve and rent a car
Accommodation / Hotel	To reserve and purchase accommodation for overnight stay
Vacation Packages	To inform various vacation packages (tour, destination, route, and so forth), either for individual or group
Special Offers	To inform a discounted vacation package, tourist destination, or leisure destinations.

The selected icons were grouped according to the referents: Flight reservation, Car rentals, Accommodation, Vacation packages, and Special offers.

1. Flight Reservations



2. Car Rentals



3. Accommodations



4. Special Offers



5. Vacation Packages



The thirty icons were selected and grouped in three different figures following the nature of their design:

- **Abstraction figures**

These figures were abstracted and simplified from the actual object, and shown as if they had concrete or material existence. Included in this group were cartoon and sketch type of icons.

- Symbolic figures
 These figures represent actual objects by association, resemblance, or convention, either in partial or full figure. All symbolic icons belong to this group. Two types of common symbolic icons were used: International (or symbolic icon-2) and US (or symbolic icon-1).
 - Realistic figures
 These are figures that tend to or express an awareness of things as they really are. They relate to the representation of objects, actions, or social conditions as they actually are. Included in this group are photographs and illustrations.
- By applying Hall's context square, these groups of icons were ordered in the continuum scale between low and high context communication.

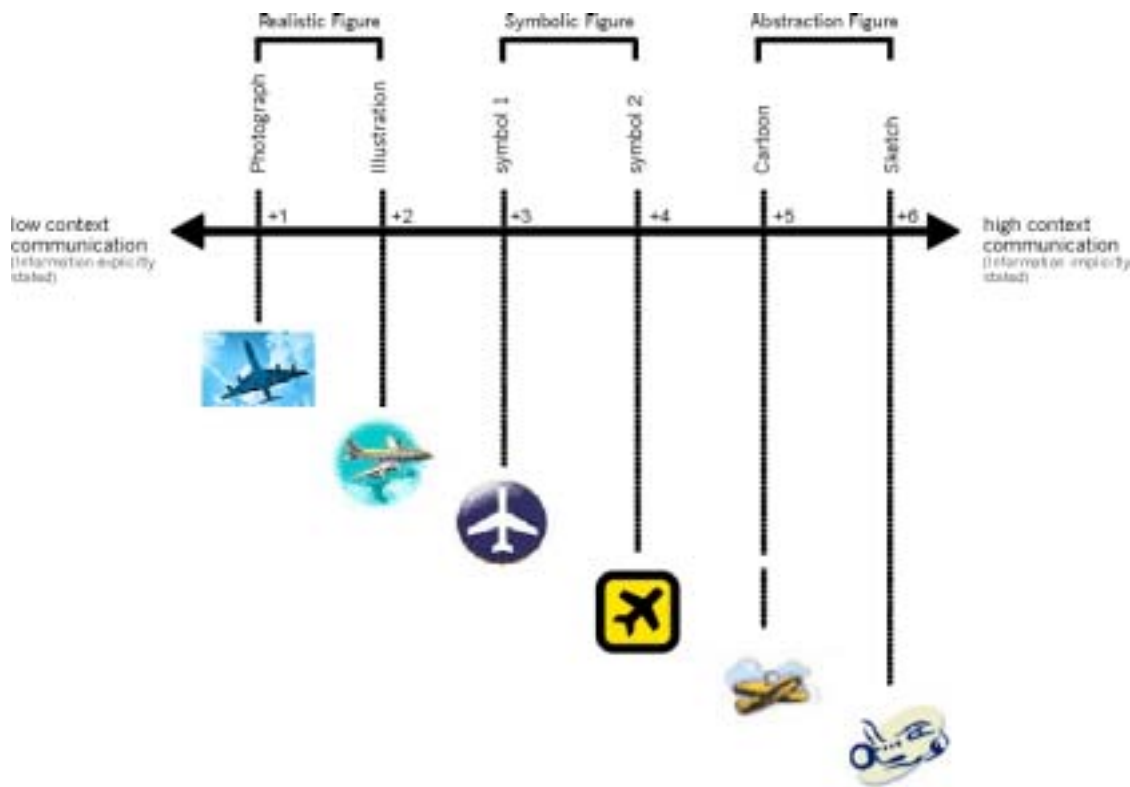


Fig 2. The continuum scale of the chosen web icons

The perception score was determined by totaling the scores of the most meaningful icon for each referent.

4. Results and Discussion

The population was purposely sampled equally on both population samples (Indonesia and the United States). The action of collecting data was taken December 2000 – February 2001. The initial results showed that differences between population samples existed.

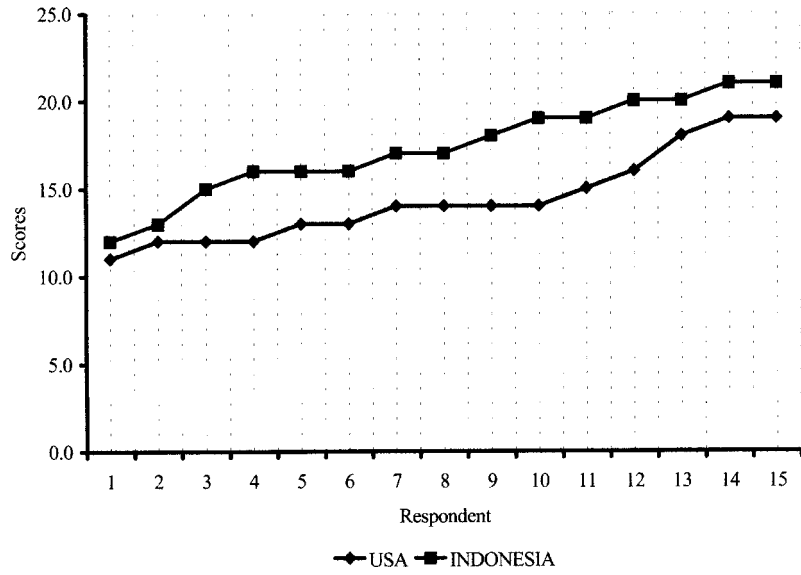


Fig 3. Mean scores comparison between population samples based on individual scores

For the Indonesian population sample, mean scores for males was 18.25 or 3.65 per referent and for females it was 16.29 or 3.26 per referent. For the American population sample, mean score for males was 15.7 or 3.1 per referent and for females it was 13.3 or 2.7 per referent. Mean score difference between males and females for the Indonesian population sample was 0.39 and for the American population sample was 0.4. The significant differences between genders from both populations were statistically tested using t-test analysis

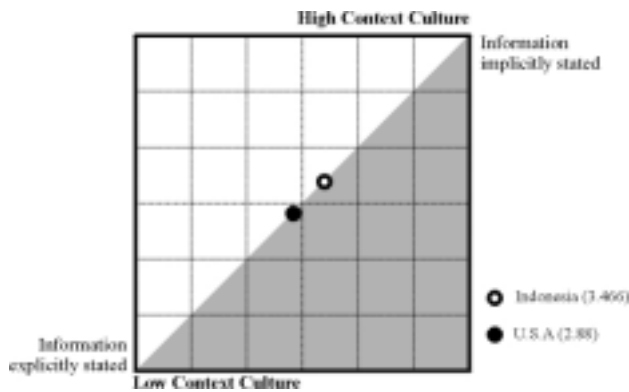


Fig 4. Overall mean scores distributions on a cultural context scale

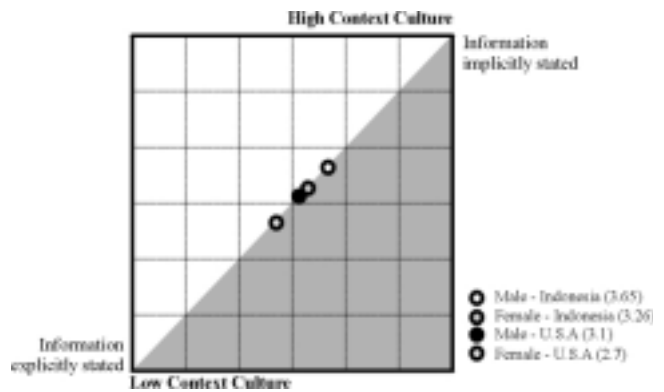


Fig 5. Mean scores distributions according to gender on a cultural context scale

The overall perceptual scores for each population showed that the Indonesian population sample tended to have higher scores (17.33 or 3.466 per referent) than the sample population of the United States (14.40 or 2.82 per referent).

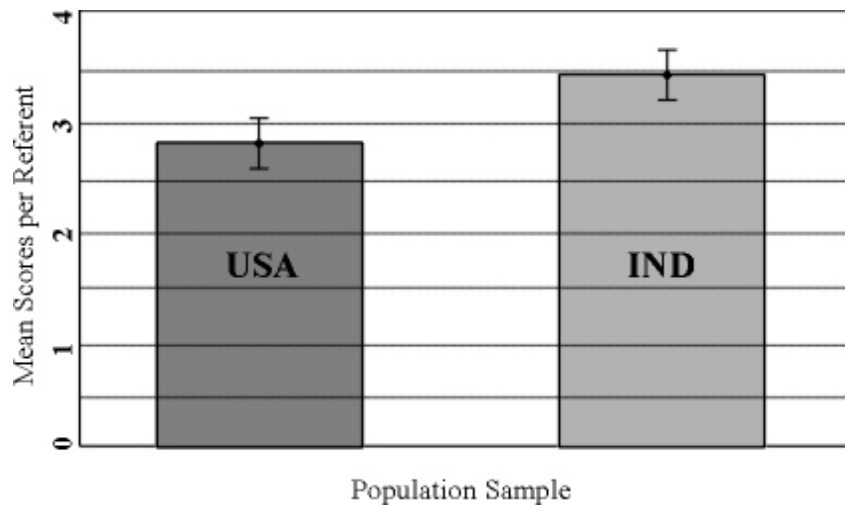


Fig 6. Bar graphic comparison between mean scores according to population sample

With two independent samples t-test analysis, this difference was found to be **significant**. This result indicated that *Indonesian users tend to have higher acceptance of implicit information or messages in web icon design than the American users*. This result suggested that for the American users, no matter how sophisticated the web icon design was, the icon itself should convey explicit information or messages.

The distribution of scores according to gender for each population showed that Indonesian male users gained the highest mean scores (18.25 or 3.65 per referent) while American female users gained the lowest mean scores (13.29 or 2.66 per referent). With two independent samples t-test analysis, it was found that the difference between male and female users within the Indonesian population sample was not significant. In contrast, it was found that the difference between male and female users within the American population sample was highly significant. This result indicated that gender difference within the United States population sample had significantly affected the difference between populations. This result also indicated that both male and female Indonesian users tended to have higher acceptance of implicit information or messages in web icon designs. In contrast, female American users tend to have higher acceptance of explicit information or messages in web icon designs than their male companions. This result indicated that the American female users tend to base their understanding on the explicit relationship between icon design and the conveyed message.

According to the modes of the chosen icons, the significant difference between populations also occurred in the chosen icon design. It showed that *Indonesians user preferred a presentation of icon design in its full depiction of the object while American users tended to acknowledge a partial presentation of object* (in the form of symbolic sign). This indicated that Indonesian users tended to base their understanding on a *full description* of web icon design or the pictured object (or symbol). In contrast, American users tended to base their understanding on the conveyed message of the web icon design and not so much on the description of the object.



Fig 7. Modes of chosen icon across population and gender

(Red dots represent the most dominant)

5. Conclusions and Recommendation for future research

This study found that there exist significant differences between Indonesian and American both in type of presented message or information object presentation and the speed of interpreting message or information. This study also showed the possibility of using cultural variables as a useful tool to understand the cultural behavior. The differences on perception toward icon design between population samples occurred as follows:

Icon Design Factor	Indonesia	United States
Message type/information	<i>Implicit</i>	<i>Explicit</i>
Message speed (related to symbol or icon)	<i>Slow</i>	<i>Fast</i>
Object presentation / Time	<i>Full [P-time]</i>	<i>Partial [M-time]</i>

However this study found limits in some respect that need further researches. First, cultural dimensions in interface design contain many variables that this research did not include. Variables such as language, education, geography, spatial understanding, religion, and social status, would enrich further study. Second, the number of respondents involved was too small and could not provide more significant support for the findings. Increasing sample size would be a fundamental step in providing more significant results for comparative study between cultures. Third, this study was solely focused on graphical web icons without text. In order to understand whether or not those

perceptual differences were actually rooted in icon design, further study is necessary to compare the perception of users when adopting graphics-only web icons with icons that combine both graphics and texts.

6. Acknowledgement

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