

# A PYRAMID OF CULTURAL MARKERS FOR GUIDING CULTURAL-CENTERED LOCALIZED WEBSITE DESIGN

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**Abstract.** During the last five years, we have done several studies aiming at understanding the link between website design and the user's culture. From these studies we have identified a number of cultural markers that affect website usability, understanding and acceptance. Based on these results, this paper offers five groups of cultural markers to be used as guidelines for designing user cultural-centered localized websites. The five groups are organized as levels in a pyramid and in this way it allows for different degrees of localization. Also internationalization can be achieved using this cultural markers pyramid.

## 1. Introduction

Most of the HCI usability researchers, to some extent, agree on the fact that “taking the user's cultural preferences into account during the website design process is, to some extent, essential for enhancing website usability” (Aykin et al. 2007; Gillham 2004; Shi 2007; Daniel et al. 2011). Consequently, there have been many attempts, based on anthropologist's cultural dimensions, to offer guidance for designing a so-called localized website, i.e. a website taking into consideration the culture of the target audience. Marcus and Gould (Marcus & Gould 2000), for example, used Hofstede's cultural dimensions (Hofstede 2001) as a basis for understanding global web design, afterwards offering website design guidance for each cultural dimension based on a theoretical analysis of selected websites. However, since the purpose of anthropology models is different, not all cultural models are suitable for using them in website design (Huang & Deng 2008).

In our earlier research (Mushtaha & O. D. Troyer 2009), we concluded that part of the culture of Web users changes and shifts with the understanding of the Web, and that the Web is an environment with its own culture. Moreover, people, while using the Web, are in fact sharing some special culture, which comes from using the Web, and this culture is different from the user's social culture. As a result, we decide to process our research results, and go a step further by providing five different groups of cultural markers. The five groups are organized as a pyramid targeting five different levels of cultural-centered localization. The lowest level provides a minimal of cultural adaptation, while the highest level ensures a maximal adaptation towards the target

culture. For each level of localization, a group of cultural markers for a set of website design elements is provided, as well as a specific number of anthropological cultural dimensions that should be considered for that specific localization level. As such, this pyramid provides guidelines for designing cultural-centered localized websites.

This paper is structured as follows. First, section 2 gives background of our previous research that we used to build upon in this paper. Then, a short description of cultural shaping and digital culture is provided in section 3. Section 4 contains the main contribution of this paper: the cultural markers pyramid and how to use it in website localization as well as in globalization. Finally, we provide conclusions.

## 2. Background

The cultural markers pyramid presented in this paper is based on several research studies on the relation between culture and website design that we have performed in the past. The following briefly restate those prior research studies:

(1) *Cultural markers in local interfaces* (De Troyer et al. 2006): Two different pilot studies were organized in order to determine the extent to which the homepage design of local web sites reflected Hofstede's score assigned to their country for different cultural dimensions.

(2) *Cross-cultural understanding* (Mushtaha & De Troyer 2007): A comparative study between two groups of users, from two different cultural backgrounds was conducted. The purpose of this study was to explore and evaluate the influence of the user's cultural background on understanding website content and interface. Moreover, 16 anthropologists and systems designers cultural dimensions used in website localization were investigated, aiming to know the most important cultural markers influencing user's understanding.

(3) *Web localization preferences* (Mushtaha & De Troyer 2009): Research has been conducted where we re-examined, validated and compared local sites from the same country aiming to understand the extent to which websites from the same country provide similar cultural markers and share the same special identity. Moreover, an empirical evaluation study was conducted to compare the cultural markers in current and earlier versions of the same website.

(4) *Cross-culture and website design - cultural evolution* (Mushtaha & De Troyer 2009): This research was built upon the existing body of research in website design and anthropologists' cultural dimensions. The research was performed in two phases: a first study was carried out to re-evaluate some pre-researched websites, and the second study was performed to evaluate and rank anthropologist's cultural dimensions. The findings of both research studies were evaluated and compared against earlier research results in order to provide insight into the evolution of the use of cultural markers.

## 3. Web User's Cultural Shaping

People who are using the Web regularly are more likely to be faced with different types of websites coming from various countries, which may result in new understandings and

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new experiences. The Web is a dynamic interacting environment and people who are using the Web are sharing that environment and are constantly in contact (directly or indirectly) with each other. Therefore, based on the majority of definitions used for culture “which are based on the fact that culture is learned from and shared by people who communicate with each other” (Barber & Badre 1998; Marcus & Ackerman 2002; Gillham 2004), we could infer that the Web and other digital communication technology has an impact on culture, as well as that it creates a culture of its own. Currently, people can do most of their daily activities using new forms of technology. For example, students can study, write, read news, get information and interact in ways that are very different from previous generations. And for that, we could say that everyone who uses the Web has a “digital” cultural identity in addition to his or her own “social” cultural identity (Reed-Swale 2009; Mushtaha & De Troyer 2009).

This means that Web users actual have two kinds of cultures, a digital culture and a social culture. The “digital culture” is powered by the use of the Web and digital technology, while the “social culture” is in relation to the customs, traditions, morals, and values that affects everyone from their physical environment, such as family, friends, religion, etc. (Huang & Deng 2008).

### 3.1. DIGITAL CULTURAL MARKERS

Digital cultural markers are website elements such as colors, color combinations, website layout, data organizing, trust signs, use of metaphor, navigation style, language cues or images; which are preferred, shared, well understood and accepted by Web users for a certain website domain and country.

In order to design a localized website, it is necessary to consider two kinds of cultural markers: *social* and *digital* ones, matching both the target context of the website. The *social cultural markers* for the target context are markers that are related to the target country or target audience, while the *digital cultural markers* are digital cultural markers related to the target website domain and to the Web for a certain country. For example, suppose that two websites need to be designed, both for the Belgium market, but one should be an e-commerce website and the other a news website. The digital cultural markers appropriate for e-commerce websites are different, to some extent, from the digital cultural markers for news websites, even for the same target context (Belgium). This type of digital cultural markers for website design is important and should be investigated separately. We distinguish between:

(1) **Web Digital Markers (WDM):** these types of markers are shared between all Web users for all domains, e.g., the home page icon.

(2) **Domain Digital Markers (DDM):** each particular domain has specific digital cultural markers and Web users around the world understand these domain digital markers in the same way. Therefore, these digital cultural markers are shared between all Web users who use the same domain. For example, the shopping basket in e-commerce websites is known by all users of e-commerce sites.

(3) **Country Digital Markers (CDM):** this type of digital cultural markers is shared between Web users from one country or society for all website domains. For example, the Franco Arabic is used between Arab Web users.

To illustrate these different types of cultural markers, consider two news website that need to be designed, one targeting the Belgians people and another for the Germans. For the digital cultural markers four sets needs to be defined: (1) The Web Digital Markers (WDM) are shared between all of the Web users, so they can be used for Belgian as well as for the German site. (2) The Domain Digital Markers (DDM) are shared between all news website users, so these are cultural markers that could be used for both the Belgian and for the German news site. (3) The Country Digital Markers (CDM) for the Belgium are shared between all Belgians Web users, so these are markers that could only be used for the Belgian news site. (3) The Country Digital Markers (CDM) for the Germany are shared between all the Germans Web users, so these are markers that could only be used for the German news site.

For the social cultural markers, two sets of social cultural markers should be considered, one for the German news website which is specific for the Germans and the one set for the Belgian people.

### 3.3. SEMANTIC MEANING OF WEB ELEMENTS

We also investigated by means of some of our studies (see (Mushtaha & De Troyer 2007)) how Web users try to understand the meaning of some unknown elements in a website (e.g., a picture, an icon, etc.). We found that (as shown in Figure 3) Web users use a specific way for understanding the meaning of an element, in which the different types of culture identified (see previous section) play an important role. The user follows a number of steps until he understands the element:

(1) Step 1: the Web user tries to link the element to the Country Digital Markers he knows, and attempt to understand the element in this way.

(2) Step 2: the Web user tries to understand the unknown element in the light of his or her understanding of other websites belonging to the same domain. Therefore, the Web user will use the Domain Digital Markers to understand the unknown element.

(3) Step 3: the Web user attempts to use his/her general Web knowledge to link the element to any website marker previously seen on websites. Therefore, the Web user will use the Web Digital Markers to understand the unknown element.

(4) Step 4: This is the final step where the Web user falls back to its own "social" cultural background. If he still does not understand the element then the meaning remains unknown.

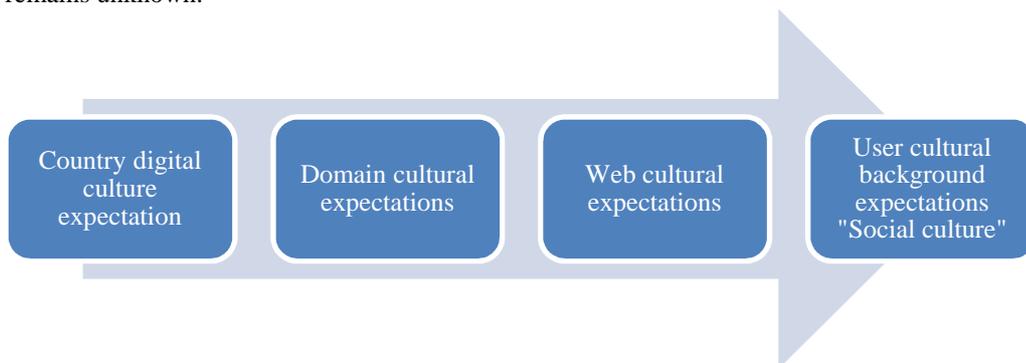


Figure 3. User's understanding of Web elements - Steps

#### 4. A Pyramid of Guidelines for Cultural-Centered Localized Website Design

In previous work (Mushtaha & De Troyer 2009), it is noted that “identifying absolute and clear-cut cultural markers or using a dedicated anthropologist cultural model for website design is not possible”. In the light of this quote, this section proposes five groups of cultural markers. These groups can be used for achieving different levels of localization. Each group of cultural markers contributes to a specific level of localization (cultural adaptation). The five levels are: (1) e-culture level, (2) stable cultural level, (3) broad cultural level, (4) variable cultural level, and (5) vista cultural level. The level in which a marker is placed represents its importance for localization – the lower the level, the more important to consider the marker. For example, markers from the first level, e-culture level, should be considered in all localized website designs, i.e. they should be given the highest priority, but the level of localization can be considered as minimal. Using markers from all levels will result in a maximal localization. Therefore, these levels are organized as a pyramid (see figure 4), where each level adds more cultural adaptation to the previous level. The five groups and the degree of importance for cultural adapted website design are based on our previous research studies discussed in (Mushtaha & De Troyer 2009).

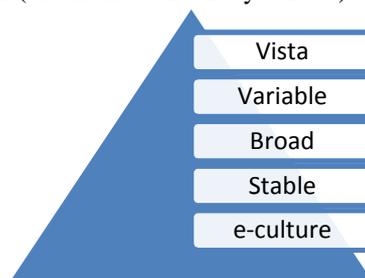


Figure 4. Cultural Markers Pyramid Guideline

Except for level 1 (e-culture level), each level considers markers for website design elements as well as some anthropological cultural dimensions. Some anthropological cultural dimensions need to be considered in order to understand the target culture when designing a website that need to be culturally adapted (Huang & Deng 2008). The first level of the cultural markers pyramid (the e-culture level) only considers markers for website design element due to the fact that this level is only about applying the new digital culture which comes from using the Web and new technologies. Social culture, and therefore anthropological cultural dimensions, is not considered in the e-culture level. The fifth level of the cultural markers pyramid, the vista level, is targeted towards full localization and therefore considers (cumulative) all the related anthropological cultural dimensions and website design markers.

The website design elements considered for the different levels are: (1) Text on websites [T]; (2) Layout and Organization [L]; (3) Colors [C]; (4) Pictures, Graphic Elements, and Sound [GS]; (5) Interaction [I]; and (6) Navigation [N]. They are summarized in table 1. The anthropological cultural dimensions considered are 16 existing cultural dimensions.

Design element	Explanation
Text on websites [T]	For this element, we consider issues such as the actual content (e.g., level of formality), language used, language cues, text orientation (centered, left-right, right-left), font type, size, and style.
Layout and organization [L]	This design element has to do with the general appearance of a page (look and feel, and form); the organization of information; positioning of the banners and menus - Position of information in a website (e.g., Arabic audience read from right to left and the first concentration on the page start from the top right).
Colors [C]	Here we consider the use of colors and color combinations.
Pictures, graphic elements and sound [GS]	For this design element we consider the use of graphic elements such as images, illustrations, photographs, icons, symbols, flags, and gestures. Metaphors used; music, video and voice; banner adverts; and trust signs.
Interaction [I]	For this element we consider issues related to any form of communication between a user and the website (input – output techniques and feedback).
Navigation [N]	For this element we consider issues about the possibilities a user has to move through the website (links, menus, dialog boxes, and control panels)

Table 1: Website design elements considered

We now describe the five cultural levels. We explain how the design elements considered in table 1 should be adapted for each level (some adaptations are required and some are advisable to consider during website localization), and which anthropological cultural dimensions should be taken into account for each level. Please take into account that the levels are cumulative; a higher level should also consider the guidelines from the lower levels.

#### 4.1. CULTURAL MARKERS PYRAMID

##### 4.1.1. E-Culture Level

As this level only considers website design elements and no cultural dimensions, we only indicate how the website design elements given in Table 1 should be adapted to achieve this first level of localization. Table 2 summarizes this. For example, in order to localize website text (element [T]) using this level of localization, two things are required: (1) translate the website text to the target language, and (2) investigate if there are specific font size and text orientation requirements from the domain or the context that need to be taken into consideration. Note that for this level, it is not required to consider the issues such as the amount of text, the font type and formality of the text. Note that the three different types of digital cultural makers identified in section 3.1.

Design Element	Markers (requirements and advices) (R): required, (A): Advice
[T]	- Used the target language (R)

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	- Use text orientation and font size as required by the domain or context (R)
[L]	- All of these design elements need to satisfy the requirements of the domain of the website. (R)
[C]	- Red, green, black, white, orange and blue colors are culturally sensitive colors. Avoid using culturally sensitive colors in this level. It is also preferred to use the standard Web safe colors. (R) - Use colors that are relate to the website's domain (i.e. colors whose have a common meaning for Web users with different cultural backgrounds). (R)
[GS]	- Avoid any type of graphical elements that carries a specific meaning related to a specific culture. (R) - Use pictures, symbols and icons known by most of the Web users and that are related to the website's domain. (R) - Symbols having cultural links should be omitted. (R) - Trusted signs: use content and security trust signals (e.g., logos of the security company who takes care of payments) that are shared between all Web users with different cultural backgrounds. (A)
[I]	- The interaction must meet the characteristics of the website's domain. For example: children's websites need special interaction techniques. Moreover, interactions in blogs and wiki's are different from interaction provided for e-commerce and university websites. For that, the website's domain plays an important role in defining and choosing the proper form of interaction. (R)
[N]	- Well-known links (e.g., contact, about us, site map) should be available on all websites. (R) - Link organization: links should be organized in a common (usable) way. Some commonly related website links needs to be group together because websites users may be used to find them together (e.g., contact link may contains sub links such as contact by email, contact by web form, contact details, etc.). (A)

Table 2: Markers for the e-culture level

*4.1.2. Stable Cultural Level*

This is the second level in the cultural markers pyramid. It considers website design elements but also anthropological cultural dimensions that are essential for this level of cultural adaptation. This level includes all cultural markers that were clearly identified and found in many previous researches, and confirmed by our previous research studies (see section 2), hence the name "Stable".

***Markers for the "Stable" Level***

Table 3 summarizes how the different website design elements should be adapted for this level. For example, as shown in the table 3, the amount of text needed and the formality of the text are both culturally sensitive and need be considered at this level. Thus, the amount of text and the formality of the text need to meet the expectations of the target culture (e.g., some societies are expecting to find more information and require more explanation, while other society's prefer quick and direct information).

Design Element	Markers (requirements and advices) (R): required, (A): Advice
[T]	- Adjust the amount of text to the target culture (R) - Adjust the level of formality of website text to the target culture (A)
[L]	- Organize and group information according to the requirements of the target culture (R) - Position of information in a website is partly cultural dependant (e.g., some users starts from the center of a website homepage while other at the top) (A)
[C]	- Culturally sensitive colors such as red, green, black, white, orange and blue need to be considered carefully to be congruent with the expectations of a target society and the domain of use. For example, what does the use of the red color in the news domain mean for Belgians? (R)
[GS]	- Every icon, picture and graphic element should be evaluated and it should be assured that those elements carry the true meaning for the targeted culture. (R) - Pictures and symbols in a website need to be related to the target culture, but pictures related to the history of the targeted culture should be avoided (e.g., a university website could include pictures of university students and buildings but pictures of historical building of the target society should be avoided if not necessary). (R) - Music, video, and voice need to be adapted to the target culture. (R)
[I]	- The formality of the relationship between the website owner and visitor needs to be investigated and understood, as this can have an impact on the style of feedback, content of contact forms, results of search engines, suggestions and comments. (R) - Investigate the rules and policies about privacy of user information (e.g., in some culture it may not be acceptable to collect private information by means of cookies(Hormozi 2005)). (R)
[N]	- How the people from the target culture find and retrieve information. (R) - How the people from the target culture expect to find information they are looking for (link grouping). (A) - The number of links in a group on a website page. (A)

Table 3: Marker for the “Stable” level

#### *Anthropologists Cultural Dimension for the “Stable” Level*

The following present the considered anthropological cultural dimensions for the stable level and explain their influence on website design.

- **Context:** “The degree of direct and explicit information needed in a website” The amount of information required, whether explicit or implicit, is culturally sensitive. This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•	•	•	•	•

- **Experience of Technology:** “Does the technological experience affect website usability?” For this dimension the website developer needs to investigate the

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attitude of the members of the target culture towards technological development, e.g., are people willing to absorb information technology and use new technology?

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
				•	•

- **Uncertainty avoidance:** “How do Web users from the target culture react when threatened by uncertain or unknown situations?” The degree of formality, predictability, punctuality, information structures, tolerance for ambiguity, focus on tradition, and acceptance of changes all differ between societies.

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•					•

- **Power Distance:** “Which communication style and relationship between website owner and the targeted audience is required?” This cultural dimension provides insight into how the people from the target culture interact in situation where differences in power is involved, which will influence proper website feedback, error messages, information structuring, etc.

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•	•		•	

4.1.3. Broad Cultural Level

This level is the third level of cultural adaptation. The “Broad cultural” level contains a collection of cultural markers discovered by our recent research studies.

**Markers for the “Broad” Level**

Table 4 summarizes the markers for the different website design elements that need to be taken into consideration for this level. For example, as shown, for this level it is required to investigate how the target audience perceives the text density, font size and style. These three text design elements are understood differently among Web users from different societies.

Design Element	Markers (requirements and advices) (R): required, (A): Advice
[T]	- Adapt text density, font size and style to the preference of the target society. (R)
[L]	- The look and feel of advertisements should follow the user’s cultural background. (R) - Position, placement and length of paragraphs should be adapted to the user’s cultural background. (A) - The organization and layout of external information (e.g., RSS feeds) should be adapted. For example, some users from specific cultural backgrounds prefer to know where the information comes from. There are users who prefer to distinguish between the website’s own information and

	information obtained from external sites. (A)
[C]	- The adaptation has to be done according to the previous cultural level; there are no special requirements in this level.
[GS]	- Investigate how much icons, pictures, and graphic elements need to be available in the target website for the target culture. (A) - Investigate how the dimension and size of graphical elements is perceived in the culture. (R) - For some cultures, videos are the preferred form of getting information, while for others text would be better. For example in news websites it is vital to investigate if the website's targeted audience within the target cultural group prefers to read news in text style or as video, or both. (R)
[I]	--- No especial action is required for this level.
[N]	- The information accessibility should meet the user's cultural expectations: e.g., do they prefer one or different paths to arrive to the same information. (R) - It may be necessary to adapt the time needed to visit a page (this marker help to know how much information and links can be put on a page) (A) - The navigational style should meet user's cultural expectation. (A)

Table 4: Markers for the "Broad" level

#### *Anthropologists Cultural Dimensions for the "Broad" Level*

The cultural dimensions to be considered in the "Broad" level are the following. In brief, the impact of these cultural dimensions on website design elements is given.

- **International trade and communication:** "*Are there national or international trade rules that need to be follow*". This dimension has to do with how much people from the targeted culture are actually concerned with or rely on standards for trade, both nationally and internationally.

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•				

- **Gender roles:** "*Refers to the value placed on traditional male and female roles*". In various societies in which feminine roles are clearly visible, there is a preference for pictures, news, and activities related to social life. For example, for a website selling cars it would be advisable to know how much the target audience is influenced by gender roles. In this example, it would allow the web designer to find out if there is a preference for pictures of actual vehicles alone, or in combination with a family, or in front of houses.

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
		•	•		

- **Human nature orientation:** "*what are the good and bad things seen or perceived by the target culture?*" People differ in terms of their understandings in things that are good and bad. There is also a difference in the acceptance of images or symbols in cultures. This cultural dimension provides information on how the target society is capable of changing and whether or not it accepts elements from other cultures.

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This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•		•		

4.1.4. Variable Cultural Level

The variable cultural level is the fourth level in the cultural markers pyramid. The cultural markers involve in this level were identified earlier in different cultural and website design studies, but do not clearly appear anymore in our current research studies, hence the name “variable”.

Markers for the “Variable” Level

Table 5 provides a summary of the website design markers for the variable level. For example, for the text element two markers are added: (1) Information outside the website domain but relevant and important for the target audience could be added (this is an advice). As an example, a transport website could include information about new vaccines against certain diseases. For this, Web developers should investigate the target audience to reveal the information they feel is important in daily life and the need for it to be available in the website. (2) Language cues and dialects: The information given should contain words and phrases from the target society (this is required). For example, a phrase in Arabic would be understandable for the entire Arab speaking word, but its meaning among Palestinians may be different from its meaning among Egyptians. At this level of cultural adaptation, local dialects should be considered.

Design Element	Markers (requirements and advices) (R): required, (A): Advice
[T]	- Add information from outside the website domain: this information has to be important and localized for the targeted audience. (A) - Language cues and dialects should be adjusted to the target society (this includes words, and idioms commonly used in the target society). (R)
[L]	- The website banner layout is culturally sensitive (e.g., having the banner on the top of website page and containing pictures and text showing some local culture). (A)
[C]	- Colors used in a website need to emphasize a particular culture (e.g., in Africa certain colors represent different tribes). (R) - Color symbolism should be considered (e.g., the color green is a commonly accepted color for Muslims) (R)
[GS]	- Pictures, icons and graphic elements should be more focused on the history of the target culture. (A) - Music, videos, banners, pictures, and icons should be more cultural oriented (e.g., famous or former leaders and historical buildings). For that, the website could (for instance) be focusing on religion, leaders, and/or historical actions. (R)
[I]	--- No especial action is required
[N]	- Investigate which navigation depth is acceptable for the targeted audience

	of the specific culture. (R) - Investigate the level of familiarity needed in naming websites. (R) - Investigate the priority of links when ordering them in menus and sub-menu (e.g., in some cultures the “director of the research group”-link should be placed before the link of any other “member of the research group”). (R)
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Table 5: Markers for the “Variable” level

#### *Anthropologists Cultural Dimensions for the “Variable” Level*

Three anthropological culture dimensions are considered in this level. The following discusses these dimensions and maps the impact of each cultural dimension onto the website design elements.

- **Time perception:** “*how cultures respond to time and how much they focus on the future*”. This cultural dimension indicates how the target audience links historical events with the current time and the future. For example, in some cultures users expect to see the same style of homepage icon or email icon in every website they visit, because they have seen it previously on websites and they expect to see it in every future website they encounter.

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•		•		•

- **Affective vs. neutral:** “*How do the people from the targeted culture express their emotions?*” This cultural dimension gives essential information on estimating the amount of emotion that is needed for a picture and even in the text of the website.

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•		•	•	

- **Face-saving:** “*What are issues and acts that avoid a loss of dignity?*” This dimension gives information about the requirements that need to be taken in order to avoid a website owner/user losing respect or dignity. Moreover this cultural dimension helps to know how the people from a specific culture prefer to receive questions, feedback, and error messages.

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•	•	•	•	•

#### *4.1.5. Vista Cultural Level*

The “Vista” cultural level is the fifth and last level in the cultural markers pyramid. It considers the following four anthropological cultural dimensions which are not noted their presence neither in our current or in previous others research studies (Mushtaha & De Troyer 2009). And therefore no website design elements markets for this level.

- **Individualism vs. Collectivism:** “*Do people from a target culture prefer to do things as individuals or in groups?*” This cultural dimension helps to identify some requirements for the website, e.g., societies based on collectivism need more collaborative-oriented features, such as FAQs and troubleshooting supports.

This cultural dimension effects the following website design elements:

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T	L	C	GS	I	N
•				•	•

- **Internal vs. External Control:** “How much do people from a target culture adapt to and are controlled by their environment?” This cultural dimension offers information on how the people from different cultures can adapt or refuse to adapt themselves, to new concepts and ideas. It also indicates how targeted groups react to unexpected or unknown situations (e.g., adapt to or refuse a new concept; blame the website designer or themselves if there are unclear concepts).

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•	•	•	•	•

- **Achievement vs. Ascription:** “How do the people from the target culture prefer to be questioned?” It is important to know how to ask the website users questions, and which communication style is common to use (i.e. how do you address people), the types of questions that can be asked (e.g., people from some cultures will be pleased if they are asked where they studied, others not).

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•				•	

- **Universalism vs. Particularism:** “What is more important - rules or relationships?” How much does the targeted culture adhere to specified rules, customs, rituals, heroes and values?

This cultural dimension affects the following website design elements:

T	L	C	GS	I	N
•	•	•	•	•	•

### 4.2. USING THE CULTURAL MARKERS PYRAMID LEVELS

The degree of website localization needed will vary from country to country, and between websites even within the same country (e.g., websites from the same country may show more or less cultural markers than others). Thus, the cultural markers pyramid can be useful in Web localization, by being able to choose the level of localization needed.

#### 4.2.1. Bottom-up Website Localization

The cultural levels should be applied respectively, starting from the bottom of the cultural markers pyramid towards the top in the correct order. This is because the markers in a level must be read as cumulative; each level depends on each lower level.

The first part of the localization process is to specify how the six website design elements, given in Table 2, should be adapted in the target website. This should be done considering the specifications given in each level. For this, the target culture should be investigated (e.g., using existing studies or by interviewing people from the target culture or people having a good understanding of target culture preferences). The e-culture level can be achieved by interviewing experts with a good understanding of the domain of the target website and of the Web culture.

Every cultural dimension considered in the cultural markers pyramid and required for the targeted level of localization, needs to be evaluated to see how the target culture is positioned with respect to the specific cultural dimension. Then, their effects on the website design elements should be investigated.

#### *4.2.2. Website Internationalization*

To achieve internationalization, i.e. have a website that is understandable and acceptable by all cultures, only the first level of the cultural markers pyramid, the “e-culture level”, should be considered. This is because this level contains the digital culture, which is shared and understood by all Web users, bypassing the cultures.

## **5. Conclusions**

The main contribution of this paper is a multi-level cultural markers pyramid for the development of cultural-centered websites. The cultural markers pyramid classifies the factors that contribute to cultural adaptation into a number of levels. This approach comes from the observation that one single cultural model for localized website design could, in fact, be a poor choice because different levels of localization may be needed in different situations. The different levels in the cultural markers pyramid allow these different degrees of localization. The degree of localization needed varies from country to country and, in some cases, even within the same country. Also the available resources to develop a website may be a factor that influences the choice for a certain level of localization.

The cultural markers pyramid identifies important cultural dimensions to be used as well as aspects of website design elements that are important at the different levels of the cultural markers pyramid. Furthermore, this cultural markers pyramid is based on a number of findings. First, Web users are using two different types of cultures to understand a website: (1) a digital culture and (2) a social culture. The digital culture is shared between all Web users from different cultural groups and is created by using the Web. The social culture is the result of growing up and living in a certain social environment. Secondly, there are some cultural markers related to a specific domain but shared between all Web users, also from different cultural groups. There are also cultural markers shared between all Web users and independent of a domain. These two types of cultural markers have an important impact on website design, and it is necessary to consider them in the first level of localization, as well as for international websites.

It must be noted that the cultural markers pyramid only provides generic guidelines, which still need to be instantiated for a certain culture. To help a website designer with this task, we developed a Localized Website Design Advisor (LWDA) tool in order to dynamically generate target localized website specifications depending on the target country, language, and level of localization (1 to 5), and depending on the needs and website domain. For the time being, the tool supports the Chinese culture and more in future. This tool will be described elsewhere.

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