CIAM: A New Assessment Model to Measure Culture's Influence on Websites

Surbhi Pratap(✉) and Jyoti Kumar

Department of Design, Indian Institute of Technology Delhi, New Delhi, India
surbhi.pratap@gmail.com, meetjyoti@gmail.com

Abstract. Literature has reported user's culture to be an influencing factor towards the user experience of a website and hence it contributes to its rejection or uptake. It has also been reported that different cultures exhibit specific user interface preferences. However, there has been limited work to develop operational models that can assess the cultural inclination of a website design, which contributes to its user experience. This paper proposes an assessment tool called CIAM (Culture's Influence Assessment Model) through deriving observable user interface elements and mapping them to prevalent culture models. The proposed markers of culture's influence on a website were derived by a creative extension of reported work in literature and then was applied on 16 websites of 8 countries by 5 industry experts. It was found that the CIAM based assessment of websites was congruent with cultural dimensions of the 8 countries. In view of these findings, this paper argues that CIAM can be a useful tool when cultural disposition of a website needs to be assessed.

Keywords: Culture models · Assessment tool · Cultural influences · User interface elements

1 Introduction

The past decade has seen several studies highlighting the importance of factoring in user's culture while designing interactive products. Studies indicate that cultural characteristics are partially responsible towards rejection or slower uptake of a system [1]. Literature has also reported variations in specific user interface preferences across cultures [2]. It is noted that localization of user interface is essential to match the cultural characteristics for a good website experience [3]. It is also reported that interfaces designed for users from a specific country were perceived more attractive [4], and improved the work efficiency of those they were intended for [5]. A rapid increase in the presence of persuasive technologies in digital products which are designed to modify human behaviour and responses is recounted [6] and is used in studies to show that prior experiences and individual's sense of self in a social context have an effect on

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his subsequent behaviour without conscious awareness [7]. Cross-cultural research also shows that in order for persuasion to be most effective, it is often necessary to draw upon important cultural themes of the target audience [8]. Different cultures produce different artefacts and environments and similarly artefacts when consumed by multitudes of people may influence or even create new cultures [3, 9]. With this premise, this paper argues that operational tools and models that measure the influence of culture on an HCI product are relevant.

Culture models of Hofstede, Hall and Schwartz have been extensively used to develop frameworks for adaptation of culture on web communication [10, 11], user experience and user interface aspects [12, 13]. However, there is little literature on adaptation of Nisbett's culture model on user interface aspects. Some studies have used Nisbett's culture model to understand the implications of cultural difference on user cognition and aesthetic perception [14–16]. Most studies use a country-based definition of culture and propose design categories or suggest direct user interface adaptations related to a culture dimension. There has been limited work to develop operational models that can assess the influence of culture using visible user interface elements using more than one culture model even though it is noted that combining two or more culture models is more effective than using only one [17]. This paper develops a tool to assess the cultural disposition of a website using visible user interface elements. Since culture influences the user experience of a website, firstly observable user interface elements were identified from 5 layers of user experience using Garett's framework. Secondly, studies from literature were adapted to map these user interface elements to culture models of Hofstede, Hall and Nisbett. Finally, a metric called the Culture Influence Assessment Model(CIAM) is proposed to assess a website design through observable user interface elements. This metric is used by 5 UX designers to assess 16 military and educational websites of 8 countries. The findings suggest that CIAM can successfully assess the cultural disposition of a website design.

2 Methodology for Development of CIAM

The methodology used to develop the proposed 'Culture's Influence Assessment Model' (CIAM) in this paper consisted of three steps. In the first step, user interface elements were identified, in the second step, the identified user interface elements were mapped onto cultural models and in the third step, a metric for assessment of cultural influence on websites was developed. Details of each step has been presented in the following three subsections. Figure 1 illustrates this methodology in a schematic.

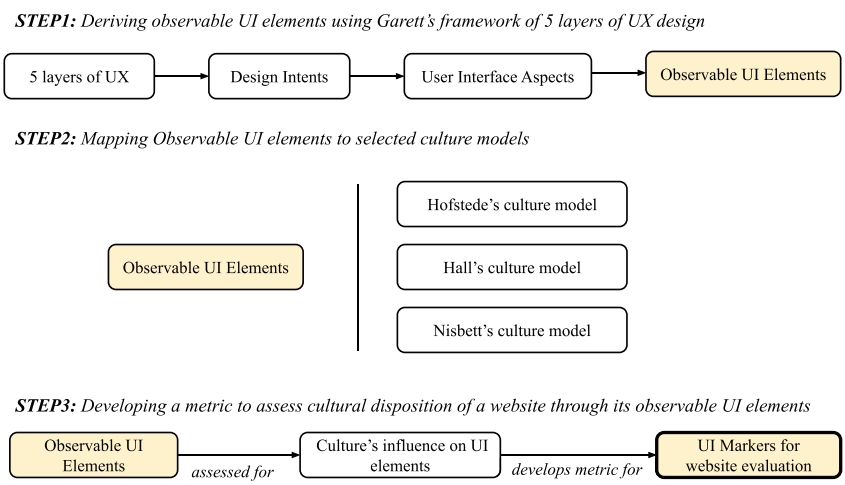

Fig. 1. Schematic diagram of the methodology used to develop CIAM

2.1 Deriving Observable User Interface Elements from Garett's UX Model

First step in development of CIAM was to identify User Interface (UI) elements from websites so that based on these elements an individual can assess the cultural aspects in the website. For this purpose, a model of User Experience (UX) design proposed by Garrett was chosen [18]. This section discusses Garrett's model and derivation of UI elements based on this model.

Garett has described the five layers as a way to build UX in websites, namely, Strategy, Scope, Structure, Skeleton and Surface. It has been argued by Garett that from UX 'strategy' to the 'surface', UX develops in 'layers' where each intermediary layer progresses from abstract 'strategy' to more concrete 'surface'. The 'strategy' layer defines the strategy of the website, which is a response to the business goals and the user needs for that product. The 'scope' layer specifies functional and content requirements of the product. This includes services, features and facilities. The 'structure' layer defines the information architecture (the workflow and the hierarchy) of the product. The 'skeleton' layer defines the navigation, layout and arrangement of elements and the 'surface' layer defines the tangible elements like buttons, text, illustrations etc. Garett's 'elements of user experience' has been used widely for assessment of UX [19, 20] and it was felt by authors to be also useful to the cultural assessment process.

As each of these 'layers' is 'designed' with an 'intent' by a 'human' UX designer, thereby there is a possibility of culture's influence in selection of these UI elements. This paper has looked into this possible 'design intent' being influenced by the culture of the 'designer' or the 'design process' at each layer of UX.

In this paper, the term 'UI elements' has been used to refer to the 'surface' layer of the website consisting of the visible elements. The 'UI elements' of a website may include *graphical markers* like colours, orientation, saturation, geometrical elements

etc.; *symbols* like fonts, images, icons, animation etc.; *regional markers* like information density (text to image ratio), grids, etc. and *surface markers* like navigational flow, layout patterns etc. These UI elements are the tangible components of a website which can be used by the website designer to create 'intended' experience. They are the means to convey a message as well as to evoke the desired emotional response from users. It is argued here that one of the ways of evaluation of a website's user experience can be to identify the types of user interface elements that have been used in its design and map them to the visible cultural influences on these UI elements. This process thus has a potential to capture the culture's influence in the websites which may be resent either due to the culture of the designer or the culture of the user captured by the design process.

In order to identify the cultural influence on observable UI elements, first the design intents at each layer of UX design process needs to be mapped. Figure 2 illustrates how the five layers of user experience are schematized into design intents and finally to observable user interface elements (OUI) and Table 1 presents the mapping.

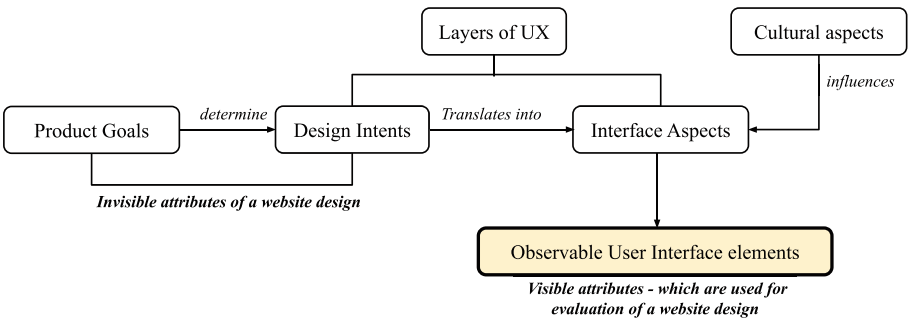

Fig. 2. Schematic diagram depicting how OUI are translated from the 5 layers of UX

Table 1. Deriving observable user interface elements from Garett's UX model

UX layer	Design intent	Interface aspect	Observable UI elements
Strategy	Persuasion - through representation/ exaggeration	Image selection	- Images that evoke a coveted emotion. - Montages/collages to create an effect
	Generation of interest-through first impression or building up learnability	Layout	- Information density - Minimal layout
		Navigation	- Navigation designed for user control - Shortcuts for repeat users

(*continued*)

Table 1. (*continued*)

UX layer	Design intent	Interface aspect	Observable UI elements
Scope	Motivation - through content - Establish context for user discretion	Text content	- High text to image ratio - Use of slogans/callouts/captions
		Iconography	- Visual correlation between graphic elements - Emphasis on symbols, certification, stamps
		Image selection	- Images celebrating youth - Images depicting conformity
Structure	Task flow - establish access control - navigation for user control	Navigation	- Contextual navigation - Task flows for user control - Direct access to nested items - Membership/sign up requirement
		Iconography	-Visible buttons that activate after signup - Use of wizards as help/support
		Social access	- Accented affiliations to outside groups - Easy sharing to social networking sites
		Text content	- Friendly messages - Chat support
Skeleton	Guide the user - through visual cues - using design principles	Navigation	- Nested/flat navigation
		Colour scheme	- Semantic colour scheme - high/low contrast colours
		Text content	- Fonts to organize content
		Layout	- Use of grids to categorize content - Use of Gestalt's principles to organize content
Surface	- Create a brand identity - Enhance the visual experience	Colour scheme	- Saturated/pastel palette - Monochromatic/Polychromatic - Colour scheme depicting a 'brand'
		Text content	- Fonts to depict a brand identity - Fonts for visual ease
		Iconography	- Ornamental icons - Icons of a 'brand'

As observable in Table 1, the first column enlists the five layers of UX as proposed by Garrett. The second column examines some of the possible design intents behind each layer. The third column classifies the user interface aspects through which these design intents could be achieved. These are then categorized into observable user interface elements which are finally visible to the user. Essentially this table derives the visible attributes of a website design from the 'invisible' design intent behind the website. After having identified the OUI elements, next they were mapped against the cultural models which is described in the next sub-section.

2.2 Mapping Culture Dimensions into Observable User Interface Elements

Literature has reported models and frameworks for adaptation of culture on web communication [11, 21], user experience and user interface aspects [12, 13, 22]. It is observed that most of the studies on culture's influence on websites have used one of the prevalent culture models like that of Hofstede, Hall or Schwartz [59]. It has also been argued that combining two or more culture models is more effective than using only one [17].

Nisbett's model of culture is another model which has been less reported to be used for website assessments though studies have reported its implication on user cognition and aesthetic perception [15, 16, 23–25]. It is argued here that Nisbett's model needs to be used for culture's assessment as this model takes the viewpoint of cultural differences on cognitive functions [26] and cognitive functions are primary to the UX while using a website [26, 27]. Hence, this paper has used Nisbett's model along with Hofstede's and Hall's. Three culture models of Hofstede, Hall and Nisbett and their implications on user interface aspects are discussed in the following three subsections.

Culture Models

Hofstede's Culture Dimensions

Hofstede [28] developed a theory of cultural dimensions using factor analysis to examine the results of a world-wide survey of employee values by IBM in the 1960s and 1970s. The original theory proposed four dimensions (later extended to six dimensions) along which cultural values could be analysed:

- Individualism-Collectivism IDV;
- Uncertainty Avoidance UA;
- Power Distance (strength of social hierarchy) PD
- Masculinity-Femininity (task orientation versus person-orientation) MAS.
- Long-Term Orientation LTO
- Indulgence - Self-Restraint IND [29].

Despite being criticized for its national concept and other shortcomings [30, 31], this model has been successfully applied in the field of HCI [29] and because of its empirical verification, is reported to be one of the most extensively applied and validated in a variety of cultural contexts [32]. There is a significant body of literature available on application of Hofstede's model in study of culture's influence on websites. Therefore for the authors of this paper, it was easier to develop a mapping of identified user interface aspects of the cultural dimensions by creative extension of the

reported influences of culture on website design. Table 2 presents user interface aspects derived from related works against the reported literature based on which the mapping was developed.

Table 2. User interface aspects based on Hofstede's culture dimensions

Culture dimension	User interface elements	References
Power Distance - PD	Structured access to information Emphasis on symbols, authority, expertise, certification, stamps Prominence to leaders vs citizens Importance of security & barriers to access Social roles used to organize information. (like a section not visible to all, but only to a member)	[11, 33]
Individualism vs Collectivism - IDV	Images/Motivation based on personal achievements vs. socio-political success (A star on your uniform vs Flag over a summit) Argumentative rhetoric vs Community slogans Youth focused vs Aged in images and ease of reading the website content. Truth(facts) vs Relationships (social morality) Emphasis on change (focus on new things introduced vs using traditional expertise) Giving personal info out in the open vs protection of individual's info and hiding behind a group	[11, 33, 34]
Masculinity vs Femininity - MAS	Traditional distinctions on gender, age and family are marked upfront. Quick results for tasks to be achieved - gives a sense of mastery of the tool Navigation oriented to control rather than support (ease of mastery in use) Attention gained through competitions, games rather than poetry & visuals Graphics, Sound & animations are more focused to be utilitarian rather than pleasant.	[11, 33, 34]
Uncertainty Avoidance - UA	Simple and minimal designs with limited and clear choices Attempts to forecast results on established patterns Navigation designed for user to be in control - you are clear where you are on the website at any given point Help options clearly given to reduce errors. Redundant cues like colour, typo, sound used to reduce ambiguity, even if those cues don't have any relation with one another.	[11, 33, 34]
Long Term vs Short Term Time Orientation - LTO	Content focused on facts rather than practice. Rules are a source of credibility and information rather than relationships/authority Immediate gratification	[33, 34]

Hall's Theory on Cultural Context

Hall describes a culture's style of communication to distinguish it [35]. High-context cultures are those in which the rules of communication are primarily transmitted through the use of contextual elements (i.e., body language, a person's status, and tone of voice) and are not explicitly stated. This is in direct contrast to low-context cultures, in which information is communicated primarily through language and rules are explicitly spelled out. He developed this on his theory of Proxemics or the relationship of one with the space around himself and the way one defines the concept of time - Monochronic or Polychronic [36, 37].

Literature has reported studies which have analysed web design aspects based on Hall's theory of context, [32, 38–42], but they do not offer an objective framework to interpret it to observable user interface aspects. In this paper, the authors have examined Hall's theory of communication, interpreted the features of high context and low context cultures for a website user and then correlated them to user interface elements identified from related works in literature. Table 3 presents the identified user interface aspects derived from related works on the effect of Hall's cultural theory on website designs.

Table 3. User interface aspects based on Hall's cultural theory

Culture context	User interface aspects	References
High context cultures	Implicit messages are accepted. Figure & Ground seen together User will blame self for not understanding the website, so will put in effort to navigate to nested items More graphical/subtle cues to communicate Loyalty & Bonding with community will work Flexible layout Entire process of navigation is more important than the final result Can do multiple things at a time Distraction by elements will be forgiven Promptness is not so important Can share space Less concern for material focused security	[11, 43, 61]
Low context cultures	Direct and clear messages sent The website will be blamed for not being user friendly, so user will lose interest if (s)he finds a workflow tedious Clear content with instructions Individual rewards will be preferred Highly organised layout Final outcome is more important than process Can do only one thing at a time Design should make it easier to concentrate on one task at a time Promptness is very important Ownership of space is very important Security of 'owned' things - account/personal layout etc. is important	[11, 43]

Nisbett's Culture Theory

Nisbett has proposed that human behaviour and intelligence is not hard wired, rather a function of their socio-cultural environment and people use different tools to understand the world around them and hence their cognitive processes vary from each other [44]. He explains how ecology and economy shape the social structure which determines the cognitive process of an individual (Fig. 3).

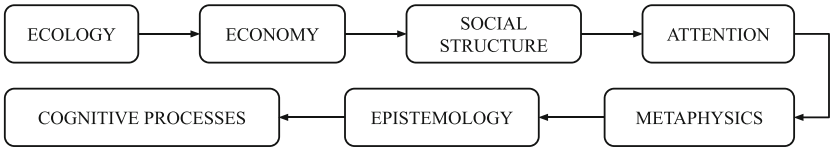

Fig. 3. Nisbett has proposed a schematic model of influences on cognitive processes

The theory proposes that due to different ecological and geographical environment, people from Asian cultures and those from the western cultures think in fundamentally different ways. The westerners focused more on the individual and their achievements. Their focus was on understanding the fundamental nature of everything, including the essence of individuals. This explained why they propounded more scientific theories. They would focus on categories with defined attributes and preferred rules and logic to separate a structure from its context. In contrast, Asians had a collectivist approach, where the emphasis was on how individuals could contribute to the society. The group was greater than the individual. They would see things in entirety, not as absolute and would prefer experience based knowledge and allow for multiple perspectives. This explained their rich tradition of philosophies and preference to predict events based on experiential learning. Figure 4 elucidates this theory.

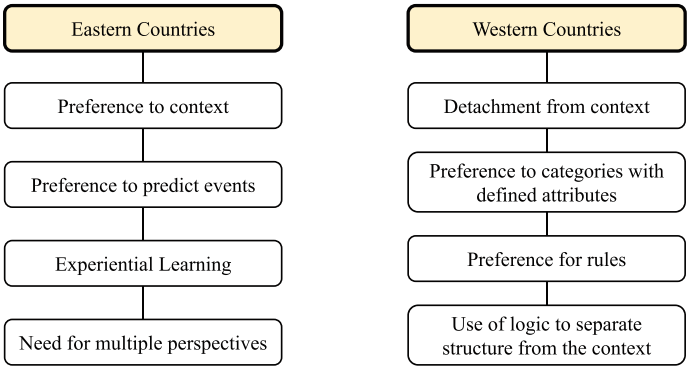

Fig. 4. Schematic of how easterners and westerners think differently according to Nisbett's theory

Nisbett's culture theory explains the effect of culture on cognition, which is an important aspect of HCI design [45]. However, it has mostly been explored to report cultural difference in perception of aesthetics, perception of object in a context and visual information processing [14, 46–50].

In this paper, inferences were taken out from related works in literature on Nisbett's theory on how cultural differences influence cognition, visual information processing, perception of aesthetics, perception of an object in a context. Next, these were examined from the perspective of a website user and user interface aspects were identified which are influenced by geography and culture of the user. The inferences are as presented in Table 4.

Table 4. User interface aspects based on Nisbett's cultural theory

Culture	User interface aspects	References
Western	- Navigation helps in control of individual elements - Visual focus on individual elements (even if they do not necessarily correlate) - Clear categories with defined attributes - First time right approach - preferred to be clear the first time	[14, 34, 47]
Eastern	- Navigation helps to put things in context - Visual focus on relationships between elements (buttons, fonts, colors, etc.) - Blurred categories - Experience learnability - repeated use(familiarity) can make the website easier to use	[14, 34, 47]

As observed in the previous sub-sections, this paper has adapted studies from literature on culture models of Hofstede, Hall and Nisbett [11, 14, 33, 34, 43, 47, 61] and derived user interface aspects from them. Using the above mapping, a metric was developed to assess culture's influence on website designs (CIAM) as described in the next sub-section.

2.3 Developing the Culture Influence Assessment Model

This section describes the development of CIAM (Culture's Influence Assessment Model) which is the main objective of this paper. For development of CIAM, first aspects of UI were derived from Garrett's UX design framework. Also, observable UI elements were listed against each aspect and each layer of UX design framework (as presented in Table 1). These aspects were then mapped onto cultural models (as presented in Table 2, 3 and 4). In this section, the process for mapping of Observable UI elements to the three selected cultural models has been done.

Table 5 displays the mapped UI elements against the three cultural models. The mapping was developed by creative extension of the research reported in literature as presented in the three tables above (Table 2, 3 and 4). Table 5 thus is a collation of specific Observable UI elements against the specific features of the cultural models. For

example, in Table 5, row number 1, the interface aspect of 'Image selection' which a UX designer decides at a 'strategic level' with a specific 'design intent' (as presented in Table 1) may choose to present the image of 'individuals' rather than 'groups of people' on the website, which is a marker of 'Individuality' in Hofstede's model, represents 'Western orientation' in Nisbett's model and 'Low Context' in Hall's model.

Table 5. Mapping observable UI elements to culture models of Hofstede, Hall and Nisbett

Interface aspect	CIAM code	Observable user interface elements	Hofstede's culture model	Nisbett's model	Hall's model
Image selection	A1	Images celebrating youth, individuals	IDV	West	Low
	A2	Images of leaders, head of institution	PD | COL	East	High
	A3	Images depicting tradition, social order	PD | COL | UA		High
	A4	Images of groups of persons, families	PD | COL	East	High
	A5	Images depicting clear gender roles	MAS		
	A6	Animations or montages to create an effect	FEM		High
Color scheme	B1	Semantic color scheme	IDV | UA		
	B2	High contrast/saturated/bright colors	MAS | COL	East	High
	B3	Monochromatic color scheme	IDV		
	B4	Color scheme depicting a 'brand'/tradition	COL		High
Icons/graphic elements	C1	Visual correlation in graphic elements	UA		
	C2	Emphasis on symbols, certification, brand	PD | COL | UA	East	High
	C3	Ornamental icons	FEM		
	C4	Visible buttons that activate after sign up	Low UA | LTO		
	C5	Use of wizards as help/support	PD | MAS | UA		High
Layout	D1	Use of grids to categorize content	PD| UA | MAS | LTO	West	Low
	D2	Use of Gestalt's principles to organize content	UA		
	D3	Low information density at first level	MAS | STO		Low
	D4	Minimal layout	MAS | UA	West	Low

(*continued*)

Table 5. (*continued*)

Interface aspect	CIAM code	Observable user interface elements	Hofstede's culture model	Nisbett's model	Hall's model
Navigation	E1	Navigation designed for user exploration	MAS | UA		
	E2	Opening in the same browser window			Low
	E3	Direct access to nested items/sidebars/menus	PD		High
	E4	Membership/sign up requirement	Low UA		
	E5	Shortcuts for repeat users	LTO	East	
Text content	F1	Fonts to depict a brand identity/tradition	UA		
	F2	Vision statements/testimonials	PD		
	F3	Friendly messages	UA | MAS | Low PD	West	
	F4	Chat support	COL | UA		Low
	F5	Free trials/downloads/toll free support	UA | MAS		Low
	F6	High text to image ratio	FEM | IDV		Low
	F7	Use of slogans/callouts for social actions	PD | COL		High
Social links	G1	Links to outside groups/subscriptions/newsletters	COL | UA		

(PD = High Power Distance, COL = Collectivist, IDV = Individualistic, UA = High Uncertainty Avoidance, MAS = High Masculinity, FEM = High Femininity, LTO = Long Term Orientation, STO = Short Term Orientation)

Once this table (now called CIAM) was developed, it was decided to give CIAM to 6 expert UX designers to be used in the process of assessment of culture's influence on websites. For this, first a questionnaire was created where each expert was asked to rate a website design for each observable UI element identified in CIAM. A total of 8 military and 8 university websites were given to each expert for assessment. The process of culture's influence assessment on a website using CIAM is described in the next section.

3 Assessment of Military and University Websites Using CIAM

The technique used for the assessment of culture's influence on a website design using CIAM was content analysis by 6 expert UX designers of homepages of 8 military and 8 public university websites.

Content Analysis. Content analysis [51] has been reported to be a technique for analysing values, norms of behaviour and other elements of a culture [52–54]. A review of 60 studies done in the past 15 years reports content analysis as the primary method to investigate cultural values and markers on websites [60].

The Importance of the Homepage of a Website. The homepage of a website has been referred to in literature as the face of the company [55] responsible to create the first impression on the user which strongly influences the user's decision of browsing the site [56]. It serves as the central point of navigation where visitors may refer back to from any page of the website [57].

Related Work in Literature. While cultural influence on website designs has been studied in literature, it has been reported that 72% of these studies were done on company and e-commerce websites and 28% included government websites like banking, university, ministry, railways. There is little literature available on assessment of cultural influence on military websites. This paper argues that while websites like tourism, entertainment etc. are designed for user engagement, most institutional websites are designed to provide information and e-commerce websites are designed to persuade the buyer to make a purchase and then generate trust for repeated purchases. Military websites, however are designed to target citizens to attract and persuade them to invest a lifetime towards the nation [58]. Similarly, public university websites are designed to attract potential students towards commitment of their golden years of learning to that particular institute. It can be argued thus that both military as well as university websites are designed to persuade as well provide information to the users. Also, in both these kinds of websites, displaying the identity of the nation or the university is an important aspect and hence the cultural influence would play an important part in the design of website user experience. There is minimal research available in the literature on cultural aspects of both these kinds of websites. In the light of this argument, this paper reports the assessment of 8 military and 8 public university websites from eastern and western countries using CIAM.

Sampling of Websites. Hofstede's dimensions were used to identify four culturally similar and geographically close countries, each from the East and the West. Geographical proximity has a significant influence on culture as brought out by Nisbett. The nations chosen in the East were India, Nepal, Bangladesh and Sri Lanka. These nations are in geographic proximity to each other in South/South-East Asia. The nations chosen in West were France, Italy, Spain and Switzerland. All of them are neighbouring western European nations whose cultures, languages, and social identities share many similarities. The French, Italians and Spanish people can be considered culturally related because their religious values, languages, immigrant influences, business practices and lifestyles are similar (Hettinger 2008). All the four nations from the east are 'high-context' while all the four nations from the west are 'low-context' according to Hall's culture theory.

3.1 Methodology

CIAM was used to assess 16 websites by six expert UX designers. The experts were asked to rate the occurence of each of the 32 observable UI elements identified in CIAM on the homepage of 8 military websites and 8 university websites on a rating scale of 1 to 5 (1 being the lowest and 5 being the highest) as presented in Fig. 5. Thus, an expert analysed a total of 512 (16 × 32) observable UI elements. Six experts analysed the same set of websites.

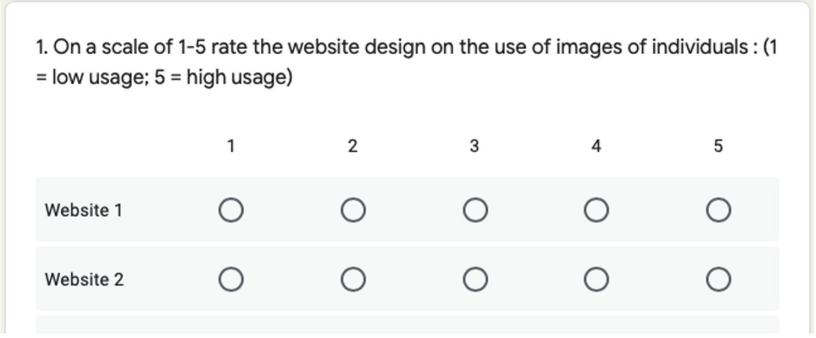

Fig. 5. Sample rating scale based on CIAM given to experts

Inter-rater reliability between the six experts was checked for a total of 3072 responses using Cronbach alpha. Table 6 presents the values for Cronbach alpha two types of websites:

Table 6. Inter-rater reliability scores for the 6 experts who rated the websites using CIAM

University websites	Value	Military websites	Value
Total no. of experts	6	Total no. of experts	6
Total no. of questions	256	Total no. of questions	256
Sum of variance for each question	257.44	Sum of variance for each question	268.44
Variance of total scores for each expert	6761.2	Variance of total scores for each expert	7545
Cronbach alpha value	0.966	Cronbach alpha value	0.968

Table 6 shows that the Cronbach alpha values was high and thus the inter-rater reliability between the experts was high. This implies that usage of CIAM gave good agreement between the experts.

3.2 Assessment Findings

The mode of ratings given by six experts was used to determine the cultural disposition of the websites. For some of the CIAM questions, the mode of ratings given by all the experts were similar for all the selected websites. This could be due to the presence of common UI elements in the sample websites. Such CIAM questions were excluded from the final analysis to avoid ambiguity in results. The ratings for the remaining questions clearly showed a difference between the observable UI elements of websites. For each military and university website which represented a specific country, high and low range of values was estimated and plotted against the high and low values of Hofstede's cultural dimensions. The ranges taken for the mode of assessment ratings given by the six experts were: 1–3 = Low; 4–5 = High. The ranges taken from Hofstede's cultural dimensions for comparison with expert ratings were: 10–50 = Low; 51–90 = High. The results are presented in Table 7 and 8. It can be observed in Table 7 and 8 that the websites ratings given by the experts using CIAM has matched with Hofstede's Cultural Dimensions. In the military websites, for five dimensions for eight countries, there was only one discrepancy each for Power Distance, Individualism, Uncertainty Avoidance and Masculinity. However, for the dimension of Long Term Orientation, the ratings did not match for 4 out of 8 websites. In the university websites, there was only one discrepancy each for Individualism and Uncertainty Avoidance and two for the dimension of Long Term Orientation.

Similarly, for each military and university website which represented a specific country, high and low range of values was estimated and plotted against the high and low context cultures according to Hall's theory. The results are presented in Table 9 and 10. As can be observed in Table 9 and 10, the assessment of the military websites by experts were in congruence with the cultural contexts of the sample countries according to Hall's theory. As shown in Table 9, there were a few exceptions like France and Italy, which were rated as being high context for 2 OUI elements each in military websites and as being low context for nine OUI elements. But it is argued here that this is because in Hall's cultural context theory, these two countries lie near the center in the range where countries are plotted between being low context and high context [59]. For the university websites, there was an exception of the university website of Switzerland which was rated as being low context for 10 OUI elements but high context for 2 OUI elements.

It is therefore argued here that the CIAM based assessment of websites is giving a good estimate of cultural dispositions expressed in the websites. While CIAM looks into the user interface elements, Hofstede's model had looked into the organisational behavioural patterns while Hall's model had looked into the communication patterns and sense of space and time. This paper had derived the user interface elements based on the literature and took assessments of websites on the user interface elements. The findings of this paper therefore suggest that there are cultural dispositions expressed in the websites UI elements which can be assessed using CIAM.

Table 7. Ratings of military websites of 8 countries assessed using CIAM and high and low values of their respective Hofstede's Dimensions (HD)

Country	PD		IDV		UA		MAS		LTO	
	CIAM	HD	CIAM	HD	CIAM	HD	CIAM	HD	CIAM	HD
SriLanka	High	High	Low	Low	Low	Low	**High**	**Low**	**High**	**Low**
India	High	High	Low	Low	Low	Low	High	High	Low	Low
Nepal	High	High	Low	Low	Low	Low	Low	Low	High	
Bangladesh	High	High	Low	Low	High	High	High	High	Low	Low
France	**Low**	**High**	High	High	**Low**	**High**	Low	Low	**Low**	**High**
Spain	Low	Low	**High**	**Low**	High	High	Low	Low	High	High
Italy	Low	Low	High	High	High	High	High	High	**Low**	**High**
Switzerland	Low	Low	High	High	High	High	High	High	**Low**	**High**

Table 8. Ratings of university websites of 8 countries assessed using CIAM and high and low values of their respective Hofstede's Dimensions (HD)

Country	PD		IDV		UA		MAS		LTO	
	CIAM	HD	CIAM	HD	CIAM	HD	CIAM	HD	CIAM	HD
SriLanka	High	High	Low	Low	Low	Low	Low	Low	**High**	**Low**
India	High	High	Low	Low	Low	Low	High	High	Low	Low
Nepal	High	High	Low	Low	Low	Low	Low	Low	High	
Bangladesh	High	High	Low	Low	High	High	High	High	Low	Low
France	Low	Low	**Low**	**High**	High	High	Low	Low	High	High
Spain	Low	Low	High	High	**Low**	**High**	Low	Low	High	High
Italy	Low	Low	High	High	High	High	High	High	**Low**	**High**
Switzerland	Low	Low	High	High	High	High	High	High	High	High

Note: PD = Power Distance; IDV = Individualism; UA = Uncertainty Avoidance; MAS = Masculinity; LTO = Long Term Orientation; HD = Hofstede's Dimensions range; CIAM = Range of ratings given by experts using CIAM

Table 9. Ratings of military websites assessed using CIAM mapped with Hall's and Nisbett's cultural models

CIAM code	Low context cultures *Western countries*	High context cultures *Mostly Eastern countries*
A1, A2	Switzerland, Italy, Spain	Nepal, Bangladesh, India, SriLanka, **France**
A3, A4, A6, B2, B4, D1, D3, D4, F7	France, Switzerland, Italy, Spain	Nepal, Bangladesh, India, SriLanka
C2, F6	France, Switzerland, Spain	Nepal, Bangladesh, India, SriLanka, **Italy**

Table 10. Ratings of university websites assessed using CIAM mapped with Hall's and Nisbett's cultural models

CIAM code	Low context cultures *Western countries*	High context cultures *Mostly Eastern countries*
A1, A2, A3, A4, B2, B4, C2, D1, D3, F7	Switzerland, Italy, Spain, France	Nepal, Bangladesh, India, SriLanka
A6, D4	France, Italy, Spain	Nepal, Bangladesh, India, SriLanka, **Switzerland**

4 Conclusion

The observations of this study indicate that the proposed Cultural Influence Assessment Model (CIAM) can be used to assess the culture's influence on websites and can give an indication towards its cultural dimension and the communication context of the culture it belongs to.

The tool however does not identify how those cultural influences were formed. Whether they are a result of the designer's culture or if they are an indicator of a good user centred design process, where the designer has designed the website for users of specific cultures. There may also be external factors like the cultures of the authorities and leaders who take the final call on the design before it is released. Also, there is a need for further work using the tool proposed in this paper called CIAM on a variety of websites to gauge the difference that cultural dispositions create in different types of websites. For example an e-commerce website may show a different cultural disposition than a matrimonial website or a tourism website. The tool can also pave the way for further studies where guidelines can be made for UX designers for user centred website design which factors in the user's culture during the design process.

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