Exploring Cultural Symbols in Nigeria for Contemporary Applications in Web Visual Design

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Abstract. The study aimed at exploring rich heritage of cultural symbols in Nigeria for meaningful and harmonious adaptations in web visual interface design. In this study, we focused on developing theme design for computer-based questionnaire form using selected cultural motifs from the Yoruba traditional textile tradition as a source of inspiration. Visual aesthetic evaluations were done by university students in south western Nigeria using semantic differential scales. We assessed the perceived aesthetic impression of the stimuli set through the main test procedure. The study reveals how the inflection and transfiguration of cultural symbols in web visual design can be visually appealing to the local computer users at a first glance and changes that might occur over extended exposure time. This paper underscores the relevance of cultural potentials from Nigerian heritage for modern day design application by using information technology as a platform towards adapting them.

Keywords: Arts and culture · Symbols · Culture-inspired aesthetic value and HCI

1 Introduction

The impact of human-computer interaction (HCI) has continued to grow over the decades, greatly enhancing interaction with products operating on information technologies. Following the remarkable influence of the HCI design methods and processes on human information processing and interaction with information systems, the understanding and consideration for culture-inspired aesthetic value can be essential towards creating a deeper layer of users' experience and fulfilling more users' affective needs. Today, the issue of cultural sensitivity in design especially for local designers has motivated the need for exploring a point of synergy between the forces of globalization and localization, modernization and traditional practices. In this case study,

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we focus on Nigeria as a multi-cultural society and an emerging economy in Africa. Nigerian arts and culture embody both verbal and visual expressions that vary and represent different ethnic groups. With over 521 languages and a rich repertoire of values embedded in her visual and material culture, the diverse cultural manifestation highlight the vividness of Nigerian lifestyle in arts, music, literature, folklore, dance and architectural expressions, underlined by her glorious traditional heritage. In the pursuit for adapting to the current trend of global innovation design and new urban lifestyle aided by advanced information products and systems, local designers have been concerned with approach to evolve from traditional root into modern design expression.

Researchers have shown that users' perception of a visual appeal of webpage, particularly at first impression, can have a far-reaching effect on the attitude towards the use of the interface systems [1–3]. As the computer application for research purpose is gradually growing, we are concerned to know whether the adaptation of local design element can be a motivational drive for the attitude of local people towards response to online questionnaire form. Prior studies have suggested a clear relationship between user's previous experience and positive attitude induced by feeling of familiarity. A theoretical account by Zajonc [4] has suggested that familiar things tend to generate favorable affective responses. Also, Sanabria [5] reported a positive correlation between familiarity and pleasure in visual evaluation of familiar ad images and words combinations. Therefore, familiarity and congruity are considered to be contributing factors in testing user's implicit knowledge and triggering pleasurable emotions.

This study aimed at exploring rich heritage of cultural symbols in Nigeria for meaningful and harmonious adaptation in web visual interface design. Our supposition is that culture-inspired aesthetic values can also offer a platform to enrich users's experience in interaction with modern information system designed for local users. Based on this supposition, this study was developed involving student participants from South-western region in Nigeria. Using an evaluation tool of semantic differential, we assessed the visual appeal and motivational attitude towards the samples of theme design interface for an online questionnaire form. The study reveals how the inflection and transfiguration of cultural symbols in web visual design can impact on the impression and usability of the local design contents by local users.

1.1 Nigerian Cultural Heritage

Nigeria occupies a land mass of 923,766 sq. km and possesses lots of attributes. Apart from being an emerging economy in Africa, it is endowed with natural resources. The diversity of her cultural resources can be seen from the composition of her ethnic groups which is well over 521. These diversities can be seen in the arts, music, literature, folklore, dance and architecture among others. The Nigerian users need to be associated with their traditional heritage while interacting with contemporary technologies. Culture from Nigerian perspective is centred on the totality of ways and manner people live together and make some meaning out of their existence putting varying factor of cultural symbols which act as means of identity. The human expression finds their way through varied forms of art and cultural activities which

represent the vividness of Nigerian lifestyle coupled together with glorious history of the past to rely upon. Nigerian art, culture and design symbols lie in the fact that they draw inspiration from the rural traditional folk heritage from different regions. These cultures that are demonstrated in Nigerians lifestyle will be translated in this paper using symbols form exhibited in visual art, dances, literature, folklores and different musics. The major forte of the Nok culture is the invention of terra cotta figurine and statues, the 10th century artistry of bronze work of Igbo Ukwu, terra cotta and metal works of Ife bronze decorated with ivory and precious stone, are major stake that earn them the popularity in other part of West Africa and beyond. Evolutional development of art and design saw the emergence of prominent crafts in the area of traditional architecture, pottery cloth weaving, wood carving mural design, body decorations and bronze casting which are popular, and peculiarities in concept influenced by cultural and religious beliefs.

Since culture is a set of distinctive spiritual material, intellectual and emotional feature of a society or social group encompassing (art, literature, value system, traditions and beliefs). They can be summed up to be either materialistic or non-materialistic. The emphasis of this paper will be placed on the materialistic aspect of human creation, which has to do with creativity in the use of talents that imbibes the symbolic expressions from various immediate environments. The diversity of Nigerian cultural symbols is exemplified in the following areas:

- The Nigerian clothing/embroidery
- The Nigerian architecture and surface treatment
- Leather work
- Body tattoo and decoration
- Music and instrumentation
- Dancing and costume
- Carving (wood, metal)

Today, there is a growing number of Nigerians who use computer interfaces to access data available on various information technologies. The issue of cultural sensitivity in design arose when users could not relate to their cultural experience with information technologies they interact. For example, when users want to customize their visual experience of a computer theme, they hardly can locate any indigenous resources to use. This gap creates the need to develop a platform that would support the exploration of cultural symbols for contemporary use. Through this cultural representation, a synergy between modernization and traditionalism can be explored within the framework of information and communication technology (ICT). This study draws experimental materials from the visual heritage of the Nigerian clothing/embroidery, focusing on the Yoruba sub-culture which is prominent in southwestern Nigeria.

1.2 The Yoruba *Adire* Textile Tradition

The Yoruba from the south western part of Nigeria are one of several sub-cultural groups with deep and vibrant design tradition. Among their creative and decorative products is the prominent hand crafted textile designs and materials used at different

functions such as initiation ceremonies, marriage, passage of rite. The hand crafted woven textiles utilize traditional cloth for making *Aso-Ebi* which features in three different class referred to as *Etu*, *Alaari* and *sanyan*. This traditional hand-woven textile is long rooted in the Yoruba culture dating back to 18th century (Clark, 1998). The *Etu*, via blue and white stripes in the warp direction and dyed repeated in indigo blue dye, worn by important personality for social dress. *Alaari* is crimson in colour woven with silk yarn traditionally used for all events. *Sanyan* is very expensive hand-woven grayish in colour production from fibres made from cocoons. This popularity adds to the cultural image of Nigeria. Another prominent textile design tradition which was purposively chosen for this study is the tie and dye cloths or pattern cloth dyeing known as *Adire* (c.f. Fig. 1). While some scholars opined that the origin of pattern dyed cloths among the Yoruba people occurred by several dyeing accidents that happened centuries ago, the account according to the Yoruba philosophy and history relayed the origin to divine inspiration of Yoruba deity of wisdom – *Orunmila* [6]. The name *Adire*, coined from two Yoruba words *Adi* (tie) and *re* (dye), essentially indicates the making process of cloth dyeing and the product. Of great fascination are the designs and decorative patterns of the cloth which signify semiotic richness and visually communicative meanings that are relevant to the history and culture of the people. Based on the process of making, there are two kinds of *Adire* namely *Adire Eleko* and *Adire Eleso*. The *Aso oke* and *Adire* cloths are used for formal occasions. The men use them as three piece wrapper and loose blouse while the men uses then as three pieces suits and long gowns. The application of cultural symbols in the South-western part of Nigeria is noted prominently in their *Adire* textile designs. The designs on these materials reflect on cultural heritage using ethnic codes and symbols to create feeling of unity, patriotism and pride for which Yoruba culture is involved.

Fig. 1. A typical hand-painted adire eleko design *Adire* textile design called ‘Ore merin’ which means ‘four friends’

2 Material and Method

2.1 Stimuli Development

In an attempt to evolve Nigeria's traditional root to modern design expression, her rich cultural heritage is explored. The exploration of the cultural heritage of Nigeria is through the selection of some cultural symbols from the Yoruba textile design tradition. For the initial selection of stimuli, we adopted 50 motifs from *Adire* textile designs which were previously studied and illustrated by Areo and Kalilu [6]. The motifs include faunal, floral and geometric symbols. These motifs bear names and they are connected with various meanings and stories which inspired them. The motifs are trans-generational and acceptable symbols which are creative and standardized elements related to the people's culture and are derived from history, proverbs, folklores, myth and everyday lives of the people [6]. For a screening purpose, a questionnaire containing the 50 adopted motifs was prepared for self-assessment through semantic differential method [7] using criteria such as familiarity, recognition of meaning and visual appeal. The screening evaluation was done by university students specialized in industrial design courses (N = 8, 33 % female, 18–25 age range). Before the participants' response to the main evaluation, they filled a set of evaluative scales which was set to explore their preferential tendency for foreign or local products. Figure 2 shows a sample of the motifs and a bipolar evaluation scale.

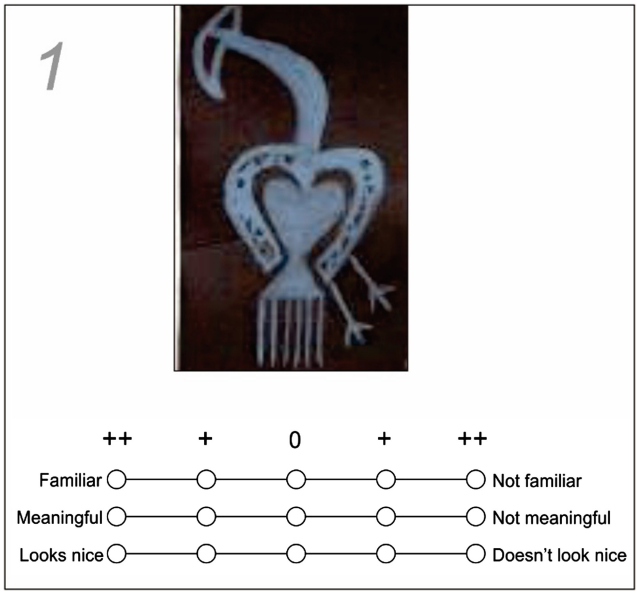


Fig. 2. An example of motifs and evaluation scales used for the screening process

2.2 Visual Semantic Evaluation Process

Following the screening evaluation, the adopted 50 motifs were sorted based on their average evaluation scores for familiarity, meaningfulness and visual appeal. A downsized number of 5 motifs set (M10, M24, M30, M29, M26) were selected for the design of the main test (this included 1 faunal, 3 geometric and 1 floral motifs). Using the 5 selected motifs, computer-generated design in form of repeated patterns were developed by two advanced graphic design students, into a standardized theme orientation that are suitable for building an online questionnaire form theme (see Fig. 3).

A visual semantic evaluation was set up for the main test. Six visual designs of an online questionnaire form were prepared using Google forms template. The themes of the forms were built using the computer-generated designs from the selected motifs and one form with a plain theme (Table 1).

Participants were 40 university students enrolled in industrial design courses (15 % female, M_{age} = 21, SD_{age} = 2.3). Using a projector and Microsoft PowerPoint program,

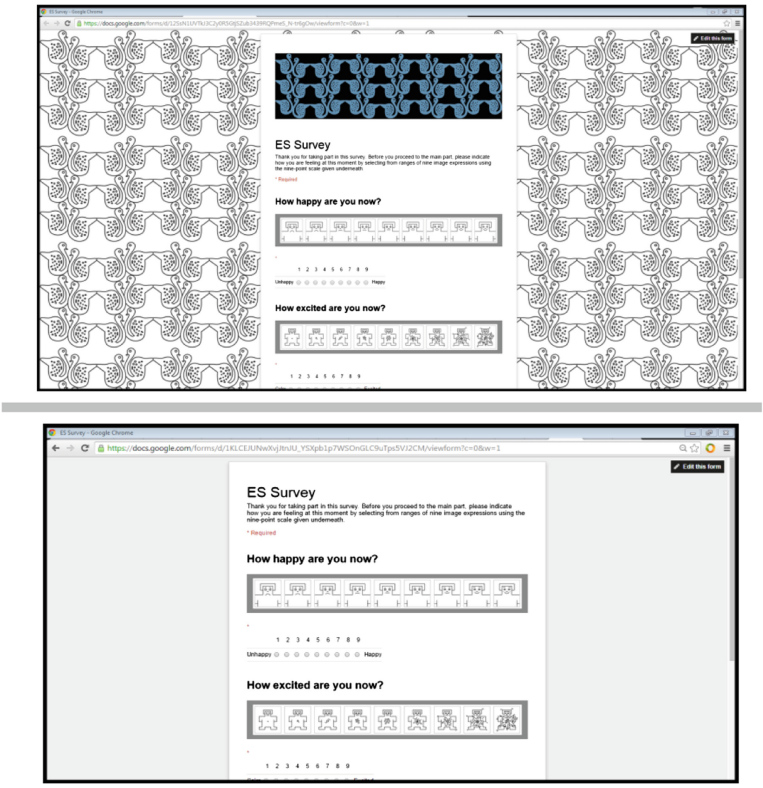
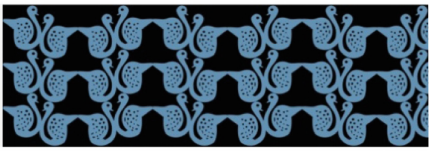
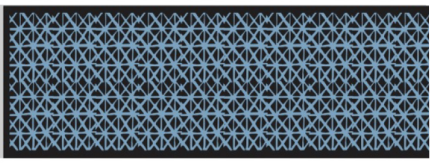
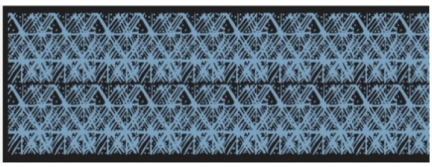


Fig. 3. Two samples of screen-shots of questionnaire form (the upper form template (M10) has motif pattern background/header design while the lower form template (MP) with a plain background/header design)

Table 1. Theme design template developed based on selected motifs

Sample Id/ Trad. name	Selected sample	Average rating scores (+2 to -2)	Computer-generated design (repeated patterns)
M10 Pepeye (Duck)		Familiar: 2.00 Meaningful: 1.63 Looks nice: 1.75	
M24 Agbo'le (Compound)		Familiar:1.88 Meaningful: 1.63 Looks nice: 1.75	
M30 Igi Oye (Chieftaincy)		Familiar: 1.50 Meaningful: 1.75 Looks nice: 1.63	
M29 Waya (Wire)		Familiar: 1.50 Meaningful: 1.63 Looks nice: 1.63	
M26 Sekere (Gourd Rattle)		Familiar: 1.50 Meaningful: 1.50 Looks nice: 1.50	

the participants viewed and evaluated twice, 6 screenshots of on-line questionnaire forms with six thematic background layouts as earlier described. Screenshots of each form page were taken within a Google chrome browser at 1024*768 pixel resolution in 32-bit true color. The form page images were shown like they were being viewed in the Google chrome environment. The form header was made of a colored version of the motif pattern samples while the background was tiled with an outlined version of similar motif pattern (as shown in Fig. 3). The participants were allowed to view each screenshot twice under two exposure time conditions – 50 ms and 500 ms. In a fixed order, the first 6 six screenshots were displayed sequentially under 50 ms while the second 6 screenshots were viewed under the 500 ms in a random order. The purpose of varying the exposure time condition was to compare the effects of exposure time on the evaluation response. As shown in a study by Lindgaard et al. [3], visual appeal can be assessed within 50 ms and may not just be taken as a 'mere exposure effect'.

In addition to the main evaluation, participants responded to a set of two questions to evaluate their level of motivation at the beginning of the test and their preference

towards computer-type or paper-type questionnaire forms. The evaluation scale used for the main evaluation is shown in Fig. 4 below.

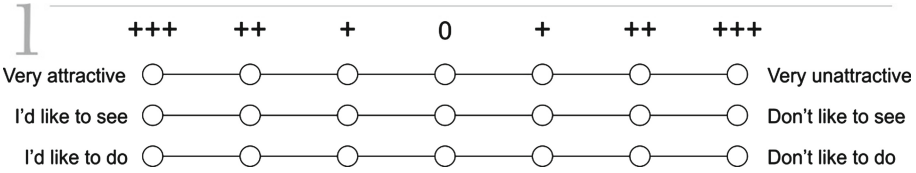


Fig. 4. Semantic differential scale for participants' evaluation for visual appeal and attitude of liking to respond to a displayed questionnaire form – participants ticked off one circle along each line to show their impression towards the projected screenshot

3 Analysis and Discussion

First, the average score of the participants' motivation prior to the main evaluation was almost 70 % high based on the self-report on the rating scale of 1 to 5. As can be seen in Fig. 5, the preference to answer a computer-type questionnaire over a paper-type questionnaire was almost equally divided among the participants (Paper-type 47.5 %, computer-type 52.5 %).

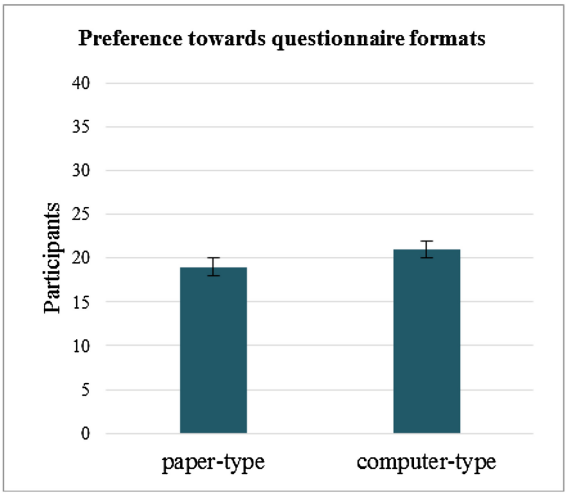


Fig. 5. Preference for paper-type vs computer-type questionnaire formats

For the analysis of the main evaluation, the average evaluation scores for each form design appearance for the first and second time conditions were calculated and compared. The summary is presented in Table 2. As can been seen, only 1 (M10) out of 6

Table 2. A summary of the evaluation six screenshots under two timing conditions

Screenshot Id	Evaluation factor	Mean rating First Phase (50ms)	Mean rating Second Phase (500ms)	Differential point of evaluation
M26	Visual appeal	-1.38	0.23	1.61
	Intend to see	-1.19	-0.41	0.78
	Intend to do	-1.42	-0.54	0.88
M30	Visual appeal	-1.15	0.90	2.05
	Intend to see	-1.05	0.89	1.94
	Intend to do	-1.30	0.57	1.87
MP	Visual appeal	-0.90	-1.63	-0.73
	Intend to see	-0.95	-1.41	-0.46
	Intend to do	-0.97	-1.62	-0.65
M10	Visual appeal	1.30	2.33	1.03
	Intend to see	1.00	2.17	1.17
	Intend to do	0.97	2.03	1.06
M24	Visual appeal	-0.23	0.58	0.81
	Intend to see	0.00	0.51	0.51
	Intend to do	-0.08	0.22	0.30
M29	Visual appeal	-0.25	-0.53	-0.28
	Intend to see	-0.49	-0.49	0.00
	Intend to do	-0.54	-0.65	-0.11

form templates had a positive rating based on the three evaluation factors for the first timing phase (50 ms) However, there seem to be a general improvement in the rating under the second timing phase (500 ms). In the latter, we found 4 (M26, M30, M10, M24) out the 6 templates gained a positive rating by the participants. The remaining two template (MP, M29) appear not be visually appealing to the participants even when the viewing time increased.

Overall, the results indicate a dissonance in the perception of the form samples under two timing conditions. While the initial impressions from the participants tend to indicate a less favorable visual appeal and attitudinal interest, the final appraisal showed a general improvement in the perceived quality and interest. At the initial rating stage, the form sample (M30) which is composed of a faunal motif, was most rated in both timing conditions.

This result suggests there could be other interacting factors which are responsible for the evaluation pattern. Apart from re-considering the physical condition of the test room such as the level of visibility of the projection and other participants-related factors, of further interest for the study will be an attempt to identify the graphical properties which triggered the visual appeal and attitudinal interest towards sample M30 over other samples. We suppose that a remarkable difference in the appreciation of the visual design could change over time as the participants assimilate other information contained in the form. Since answering a questionnaire could be seen as

task, the study has observed the need for researchers using online survey instruments to pay more attention to the overall appeal of the form design. Perhaps, this might be a rewarding trigger that stirs the interest of the target respondents.

4 Concluding Remarks

In this study, we have attempted to use the Nigerian *Adire* traditional textile motifs as an adaptable element in building an attractive 'feel' to trigger respondent's interest towards on-line questionnaire forms. Following a test procedure of visual semantic evaluation, 6 samples of questionnaire theme design were prepared and evaluated under two exposure time conditions. Based on the evaluation response using three rating factors operationalizing visual appeal and intension of respondent's to like to see and answer to computer-based questionnaire form, the results indicate some positive attitudinal tendency towards local contents in computer interface designs. Possibly, this design adaptation might also be applicable for designing meaningful interactive and dynamic contents for webpage designs.

Cultural symbols are fascinating, but they represent concepts that are unique to traditions. They carry a wealth of associations and meanings. Iyang [8] noted that, "Continuous researches in the various culture of mankind have brought forth a large compendium of symbols and meanings that were once embedded in folklore". Iyang [8] added that "symbols may be anything: objects, words, colors, or patterns; their defining characteristic is that they stand for something other than their intrinsic property…" As the traditional arts and crafts of the pre-literate African society are fading gradually in the face of globalization, designers could stand for as preservers of this valuable cultural knowledge and creative visual expression by developing for them an adaptable modern platform. This paper underscores the relevance of cultural potentials from the landscape of Nigerian cultural heritage for modern day design application in information technology. With further advanced research on exploring means to integrating local designs and meanings into computer interface design, the study hopes for possibility of building a richer interactive experience and harmonious overlap between tradition and modern technology.

Conclusively, the study foresee that if the cultural symbols is offered a platform to enrich users' experience in interaction with modern information system, it can offer the advantage of enriching visual interface to make them more meaningful and rewarding to the local users while at the same time allowing intellectual cultural heritage go hand-in-hand with information technologies. Nevertheless, more questions remain to be addressed in order to promote an effective application of visual culture in HCI.

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