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A Yoruba Cultural Tradition Repository Knowledge Based System

Authors
Emuoyibofarhe, N. Ozichi[1], Adebayo Segun[2], Lala, G. Olusegun[3], Aremu, R. Omolola[4]
[1234]Dept. of Computer Science & Info Technology, Bowen University, Iwo, Nigeria
Email: *eozichi@yahoo.com*

ABSTRACT
In recent years researchers and experts have traditionally focused on how to enhance the look and functionality of how life issues are been tackled with respect to Africa cultural tradition for academic purposes and the development of cultural traditional system. Also, the discrimination between English and Yoruba language in the south west states has now become a norm, that modern civilization culture is preferred more than Yoruba cultural heritage and language. These anomalies have caused the disintegration of the native cultural norms thereby putting the language on the verge of extinction in the nearest future which will eventually lead to another psychological and indirect slave trade. The aim of this research is to design and develop a knowledge base cultural traditional system user friendly interface information system for learning of the cultural tradition with the purpose of having a better understanding of the antiquities of the Yoruba cultural norms which will provide antidotes for the revival and restoration of the cultural norms. The iterative model approach was used to iterate the steps of the research progresses of the requirements and iterates the requirements, design, build and test phases again and again for each requirement until the system is completely built. The research coding was done using Microsoft visual studio c# environment, and for the database, MySQL used. The software requirements was windows operating system version HP 8.1, Windows-Apache_MySQL-PHP(WAMP) which contains PhpMyAdmin which has the facilities that provides the graphical user interface for the MySQL database manager while Microsoft Visual C# was use for the user interface. The study has been designed to give further knowledge. And this will raise the standard of our knowledge of the heritage and the overall system works perfectly well under the set conditions and availability of the specified hardware and software requirements. Hence, the resulting model from this paper would help to sustain the YCT in Nigeria and Diasporas.

KEYWORDS: *Knowledge base, Yoruba Cultural Tradition, Iterative Model Approach, WAMP and Microsoft Visual C#*

1. INTRODUCTION

Man's origin is important in life, thus that which shows a man's origin and tradition is its language and culture relief. Yoruba is the tonal language vastly spoken in South Western Region of Nigeria; having an internationally certified language with codes; ISO639-1, ISO639-2 and ISO639-3 under the International Standard Organization (ISO). The native speakers constitute of about 30% of Nigeria's population with three basic significant tones with dialects ranging from 12-26 [(17)]. The Yoruba cultural tradition (YCT) resources, like every other African cultural tradition are faced with the danger of interethnic interaction, western civilization and globalization. Also, it was discovered that the available few cultural resources are kept in memory institutions such libraries, museums and achieves which is only accessible to a few of the citizenry from the region (Hassan, J.A., Odejobi, O.A., Ogunfolakan, B. A. and Adejuwon, A., 2013).

Hence, with the era of westernization in the area of information technology, a knowledge base system approach will be adopted in the system plaguing the region in order for the cultural tradition not to go into the verge of extinction in the nearest future which will difficult recovering all the cultural tradition; also will help in enhancing the effective adaption and learning of the YCT among the citizenry and schools. Thus, in this era of western technology, the role of technological designs cannot be overruled since the concept here refers mostly to the methods and processes adopted in handling the problems in a high uncertain system, whereby more detailed information will be acquired, knowledge analysed and solutions will be posited to the system. Hence, the strategy is to combine empathy for the context, creativity in the generation of insights of the cultural tradition and having rationality to analyse and fit solutions to the context; which will reactivate the knowledge base of the YCT system in the region leading to the revival and beauty of it. An iterative process of observation, ideation and implementation is integrated and applied within the YCT knowledge base system in order to create a platform for the continuous improvement of the system.

The origin of the Yorubas has been traced to the Yooba in the phrases Yooba baba e, Yooba iya e which is an angry irritating abuse among the Oyo people that the northern neighbours were endemic in their community. Later the Hausas living among them changed and popularised as Yariba or Yarba and researchers discovered that they are the descendants of legendary Oduduwa, the first king of Ile-Ifẹ found mostly in the south western part of Nigeria though spread around some regions in west Africa and in Diaspora, and all over the world as economic migrants which consisting over thirty-five [(35)] million people worldwide [(12)]. Samuel Ajayi Crowther 1809 to 1891 and other missionaries in 18th century started the spread of the cultural tradition with the translation of the scriptures words (Bible) for evangelical purposes; which led to the emergence of writing and studying of the Yoruba language and culture among the free slaves settlers in Sierra Leone known as Aku tribe [(17)]. This bring about to the birth of the Yoruba kingdom which is identify both by the language structures consisting of various dialect variants and similar customs and traditional practices; also, Research has it that they are generally known for their world acclaimed tradition, heritage sites, antiquities and ifa literacy belief (Hassan, J.A. etal, 2013).

Figure 1: The map showing the various Yoruba tribes and states. (Source IITA Image Library)

In the Yoruba cultural traditional (YCT) emphasis is attached mostly on the following aspects such as the greeting mode for example greetings on every occasion, season, job, and events and anyone who lacks greeting courtesy is considered to be uncultured, and uncivilized; greetings such as Traders/Sellers for“Ẹ o ta o. Aje a wọ igba o, Ẹ ku ọrọ aje,”
festive mood for “Ẹ ku Ọdun, ẹ ku iye dun” with response as“A o ṣe ọpọ ọdun la’ye” [(28)]. Names are also placed in high values and strongly beliefs that individual names are an exact representation of an individual character, personality and a symbol of a home which is given seven [(7)] days after the birth of the individual also kept in secret unto the day of the naming. These names are classified into six or more categories namely destiny Names (sometimes called situational names) names brought from heaven, given or birth name- that is name given at birth (Orukọyorukọ),

circumstantial names, family names (Orukọ-apele), name by profession, job done, religious name- traditional, Christianity and Islam, self-styled names (Orukọ-alaje, Orukọ-anije) and nickname (Orukọ-efe, tabi Inagije) [28]. The culture has a very strong numerical system, which makes simple arithmetic of addition, subtraction, division and multiplication possible such as shown on table 1 below. In the culture, ordinal numbers are not different from the cardinal numbering except on their pronunciations; where the cardinal numbers are formed and pronounced with any of the five out of seven Yoruba vowel letters (E, O, Q, E, and A) or with a consonant letter (M) while the ordinal numbers usually are started with the consonant letter (K), which shows the order or arrangement of things by precedence. The counting in Yoruba is usually done with the first unit numbers (1-10) by addition and subtraction and is a convention which continues at every mid-point of a number such as 25, 35, 45, 55, 65, with addition of a tenth number but after forty (40), every none-divisible-tenth number will be twenty such as 50, 70, 90, 110, 130, and has an inflectional word known as din, which is less. Twenty (20) and two-hundred (200) are very important in Yoruba numerals and plays the functions of divisor and etymology for other Yoruba numbers with the exception of 400 which is known as Irinwo; even other numbers that are divisible by 200 derived their names by the multiple or number of divisor for example 200 × 3 will be equal to 600 (Egbeta) meaning Igba lona meta while the none-divisible hundreds except 300 is Qdunrun (Yoruoedia.com/subjects/ education/. The table1 below illustrate the number system of the YCT [28].

Table 1: The Cardinal and Ordinal Yoruba Number System (first 20 numbers)

English	Yoruba Cardinal	Yoruba Ordinal
1	Qkan	Kinni
2	Eeji/Meji	Keji
3	Eta/Meta	Keta
4	Erin/Merin	Kerin
5	Arun/Marun	Karun
6	Efa/Mefa	Kefa
7	Eje/Meje	Keje
8	Ejo/Mejo	Kejo
9	Esan/Mesan	Kesan
10	Ewa/Mewa	Kewa
11	Qkanla/Mokanla	Kokanla
12	Ejila/Mejila	Kejila
13	Etala/Metala	Ketala
14	Erinla/Merinla	Kerinla
15	Arundinlogun/Marundinlogun	Karundinlogun
16	Erindinlogun/Meindinlogun	Kerindinlogun
17	Etadinlogun/Metadinlogun	Ketadinlogun
18	Ejindinlogun/Mejindinlogun	Kejidinlogun
19	Qkandinlogun/Mokandinlogun	Kokandinlogun
20	Ogun	Ogun

Before the introduction of mechanical watch by Western culture into the region, people used various ways to indicate time through the observation of movements of certain objects either living or non-living and behaviour of some animals to read time. Prominent among the time indicators is the sun, from dusk to dawn which controls the activities of the day; also listening to the crowing of the cock which is normally in the early morning, mid and late evening. With these time indicators, the daily responsibility and activities in the olden days are measured. YCT time period is divided into 7 time period displayed on the table 2 below.

Table 2: Yoruba Time Period

Time Period	Yoruba Equivalent	English Equivalent
12 AM- 3AM	Oganjo/Aajin-Oru	Mid-night/Dark time of night
4 AM -6AM	Aferemoju, Idaji	Twilight,Dawn or Early Morning
7AM– 11 AM	Iyaleta, owuro, Aila-Orun	Sun-rise
12Noon–2PM	Qjokanri, Osan-gangan	Mid-Day
3 PM – 5 PM	Qjoro/Irole	Early part of the Evening
6 PM – 8 PM	Asale/Ale	Evening/ Dusk
9 Pm – 11 pm	Oru/Ojonre b'ana	Latenight/Time to Sleep

In YCT, the concept of marriage is one of the oldest institutions among the people that mark the end and the beginning of a new era between two different individuals who have agreed to live together and have a union that will create an

everlasting friendship between two different people. The preparation were not left in the hands of the prospective couples rather was regarded as families' affairs and several procedures are done and still valid before the marriage could be consummated such as the search for spouse which will be initiated by the males (Ifojusode), wall-scratching time (Idẹgiri), acceptance/voice-opening (Iṣiun), family soliciting (Itọrọ), betrothal (Idana), the marriage ceremony and handing over the bride (Igbeyawo)(28). Then after the necessary procedures, some items will be required for the marriage ceremony to be fully consummated which are as follows with their importance a bottle of wild honey (oyin) which symbolic value is that the couple's life will be as sweet as honey and blessed with promising children, Alligator pepper (Atare) comes in a pod with multiple seed which symbolizes blessing, healthy and prosperous children for the couple, Ground-nut cake (Adun) is a local cake made from ground nut that signifies sweetness, blessing and prosperous future for the couple and their children, Local wine (Ọti-Ṣẹkẹtẹ) represents water, stands as life which is treasured for its multiple use for wishing the couple a peaceful life that is free from hate and dislike; Kola-nut(Obi-Abata) with four halves, 42 or 100 pieces which has several social and spiritual values in the cultural tradition symbolizing fertility and protection from evil and used to pray for the fruit of the worm, Bitter-nut (Orogbo), which can either be 42 pieces or more representing old age, prosperity and trouble-free world to the couple, Palm oil (Epo-pupa) has several uses which has an antidotal value suggesting no evil will befall or come close to the couple, Salt (Iyọ) serve as a preservative and sweetener, indicate that the life of the couple will be full of joy with trouble-free finally Yam(Isu) which is between 30 and 100 tubers depending on the status or wealth of the groom's family. Then prayers legitimizes and solemnization the couple's relationship in the presence of both families and well wishers where the bride and groom will be advised and counselled on how to relate, live, and care for one another and their family members of the husband [30]. Some of the marriage items and features are shown in figure 2 and figure 3 below

Figure 2: Kola-Nuts (Source: google.com)

Figure 3: Items for Traditional Wedding for YCT

Source: (motherlandnigeria.com/picture)

Objectives

In view of this factor plaguing the region, this paper seeks to create a Yoruba cultural tradition (YCT) information system platform that will address the situation by reviewing and analyzing the current cultural traditional process in relation to information technology. We aim to design and further develop a user friendly interface information system for learning of YCT in order to have a better understanding of the antiquities of the Yoruba cultural norms thereby providing antidotes for the revival and restoration on YCT.

Vision

Our vision is to set an antidote that will bring about the revival of the Yoruba indigenous culture which will enable users to get information about the Yoruba culture such as the language, the art (which include the genre), the family and the people with their various dialects [15]. From our research findings we discover that the cultural heritage is gradually going into extinction among the south western states of Nigeria due to the advent of technological advancement in the world which has called for the need to charge Yoruba elites to strive towards making research on how to design and manufacture a Yoruba cultural tradition application with software programs that will run them. These are recommended as the world is shifting to softcopy (electronic writing/e-copy). This research will encourage interested individuals who are willing to express their thoughts and creative minds in the application. Also, the educational system will be enhanced and effective thereby boosting an experienced transformation and standard to both the poor and middle class citizens within the region.

2.1 Review of Related Work

Within the development of YCT knowledge application, focus have been made by some researchers on how to sustain the cultural heritage of the Yorubas thereby leading to a positive approach towards achieving the technical know-how and better understanding of the cultural traditional background. Hassan etal in 2013 gave an overview of the ontology Engineering in Yoruba cultural heritage domain; where the study and analysis of the system was reviewed by incorporating the embedded knowledge found in the museums and monuments of Yoruba antiquities and their significant without much emphasis made on some of their practises and relief. Many researchers, however, have represe-nted the knowledge of the cultural tradition resources from the review of past works through Yorubas orally in folk dirges, ifa literary corpus and lineage orikis, sculptures, handicrafts, poems and encrypted in aroko[18] Also in Yoruba-English medical mobile chat application which allows for language flexibility through the use of the language translator with the possibilities of using the medical informatics sectors was developed thereby helping to give patients the opportunity of having remote access to the various medical specialist [22].Nevertheless, although some cultural knowledge and innovations were provided but through semantic web technologies for knowle-dge, oral, visual and encrypt representations of knowledge but YCT were not altogether expressed in detail thereby indicating the weakness of the existence of the system. This application makes use of one of the most practical and widely implemented applications of artificial intelligence in the development of expert systems and other knowledge based information systems. A knowledge based information system KBIS adds a knowledge base to the major components found in the other types of computer based information systems. Therefore, an expert system is defined as knowledge base expert system that uses its knowledge about a specific, complex application area to act as a retrieval source to users. Expert systems are related to knowledge based decision support systems, which add knowledge base to the database and model base of traditional decision support systems. However, it will require novel and integrated solutions built upon YCT platforms that will give users control over the cultural tradition and bridge the gap between the modern civilization and the Yoruba heritage and relief.

2.2 Comparison of our applications to other existing applications

The application developed in this work is not the first, but it however addresses and provides an entire flexibility of YCT for both the generations present and future. The cultural tradition are not fully documented which is leading to the extinction of the culture thereby allowing western civilization to set in to the region. Our solution bridges this barrier and emphasis is majorly on YCT.

3. OUR PROPOSED SYSTEM

The work presented in this research is performed within the south western part of Nigeria and conducted using the iterative model approach which is an approach that is used to iterate the project progresses steps with requirements. This model iterates the requirements, build the model design, and test phases frequently for each requirement which aid in the building up the system iteratively until the complete system is achieved. Thus the iterative model is used in order to contain all the features of the system. The system was developed using c# language of Microsoft visual studio.NET framework 4.0. MS-Server 2005(Server Management Studio) and a database connector-open database connectivity (ODBC) to connect the database [30]. The database will consist of unique tables which hold various data. The database will be connected to the interface using the C# code which makes it easy for users to use the system thereby creating a more secure environment since it is only the administer-ators will be allowed access to the database where any modification in the content of the system log in with their credential will done, also the input made by customers via interface will be available in the database. For example, if a user just made a request from the interface, the information will be available at the request table in the database. Figure 4 shows the overview of the YCT system.

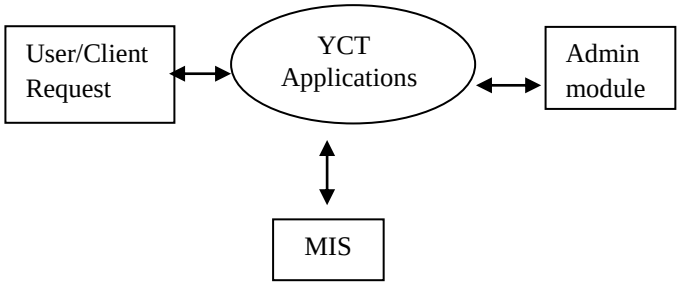

Figure 4: The System overview diagram

The system has two-tier architecture comprising of a graphical user interface (front end) which allows the user to enter data, logic (code) also interact with the database (back end). The GUI application will optionally perform validations and then send the data to the database for execution of the logic (codes) once the entry is completed and the front end resides in the PC machine. The architecture is extensible and scalable in order to contain all the features of YCT platform and MySQL database server (2005) was used as a repository for all the data information in the module while language employed is the structured query language (SQL). The overall objective of the system is to make the processes of getting to know YCT easier. It will increase the interest of the users to know more of the cultural relief and traditions since they can always have it at their possession. The figure 5 below shows the architecture of the proposed system.

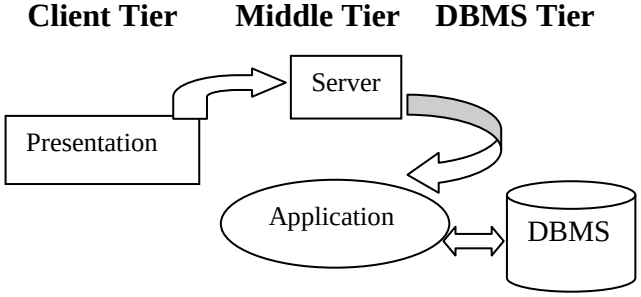

Figure 5: The Application System Communication Architecture

3.1. Methodology

The system uses the iterative model approach which helps in iterating the steps involve in the progresses with requirements. Iterative model iterates requirements, design, build and test phases until the system is completely developed. Each release of iterative model is developed in a specific, fixed time period called iteration. Each iteration focuses on a certain set of requirements and the cycle ends in an executable release. The approach is adopted here because of the advantage to accommodate changes in the system requirements; also has the facility to identify, build upon any major requirement or design flaws that will occur in the process and access to the previous phases making changes accordingly if the need arises. The final output of the product is revived at the end of the design. The software requirements was windows operating system version HP 8.1, Windows-ApacheMySQL-

PHP(WAMP) which contains PhpMyAdmin that has the facilities which provides the graphical user interface for the MySQL database manager while Microsoft Visual C# was use for the user interface. It helps for the server to efficiently run the expert system and deliver pages and queries efficiently and faster.

Model of the flow structure of the system

This flow structure of the system in (fig.6) was designed to suit the system platform which ranges from one activity to another and depicted as the operations of the system that helps to visualize the entire working and understanding of the YCT processes.

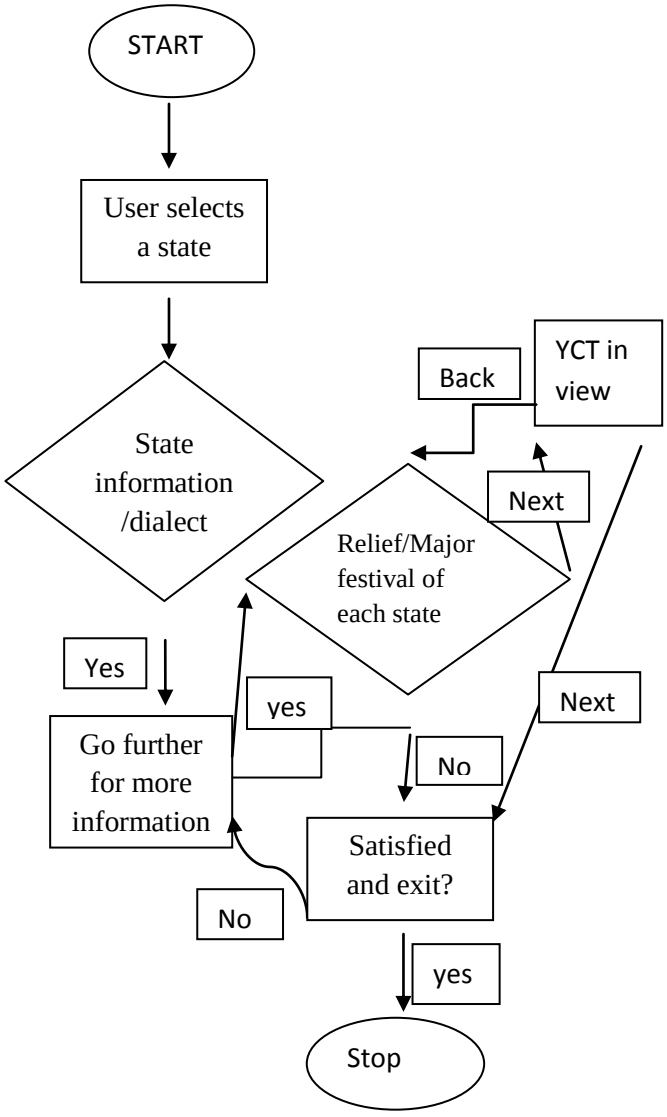

Figure 6: A Message flow chart model of the proposed system

4. Implementations of Results

The implementation was done using MySQL and Microsoft Visual Studio C# environment in order to realize the designed system and meet the requirements of the YCT platform system. Also, user-friendly interface was developed consisting of forms developed by C# in order to enable the users perform the tasks of viewing of all the category of the YCT Information, making a request/ place a comment and revisiting of the final System Platform from the YCT system.

The illustrations and the following screen shots below shows the functionality and processes of the YCT system platform: Figure (7) shows a request the user selecting a state from the state map displayed on the box provided, Figure gives the user the opportunity to view one of the languages spoken in the state selected in figure 4.1, Figure (9) shows the measurement page where users view to any of the items indicated by button such as the Number, alphabet, shapes, day, and Month. Also, allowed to go back to the previous page by clicking on the button "BACK" or go to the next page at the click of the "NEXT" button, Figure(10) shows the list of the relief in a list box and the picture of the major festival in each of the state based on the selected state by the user and the previous page or going to the next section for further information on the application are provided Figure (11) shows information on the state selected such as the state motto, the number of local government in the state, the state governor's name, the deputy governor's name, the state population, the land area occupied by the state clicked on by the user, Figure (12) shows the two options in which a request has to be made if the user wants more or wants to recheck the visited pages, Figure (13) and Figure (14) shows the Yoruba marriage procedures which include the marriage step and the marriage items, Figure (15) shows the names and the interpretation of the names given in Yoruba land which are divided into sections such as destiny names, names based on religious worship, names by profession, circumstantial names and Figure (16) shows the

different greetings of the YCT, the user will be able to see the different ways to greet in Yoruba land since they believes in giving kudos to people it has been categorized into different sections such as ceremonial greetings, job greeting and so on. Then finally Figure (17) shows the comment page where the users view of the application, feedbacks from the user on the need to enhance the application also an encouragement to the user on the necessity of the YCT application system.

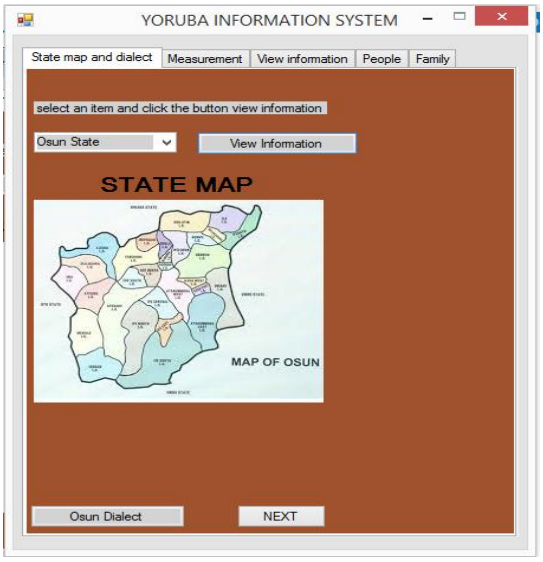

Figure 7: The Homepage

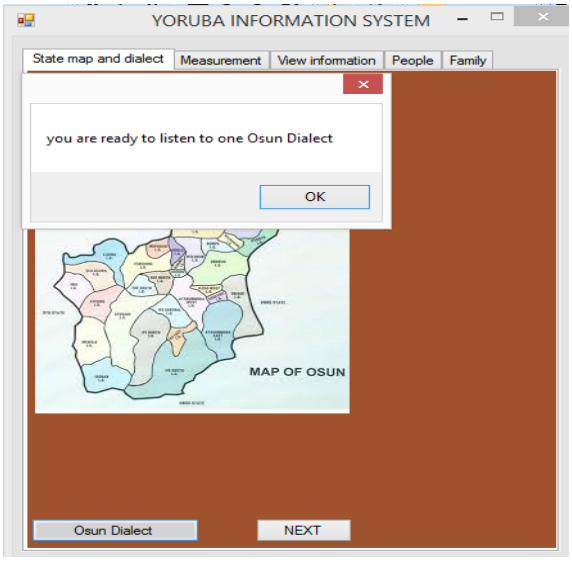

Figure 8: A message box indicating the use readiness to view any of the languuages

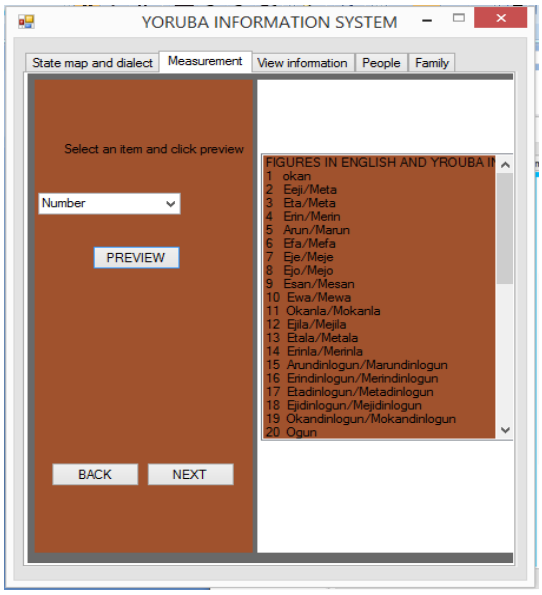

Figure 9: measurement page

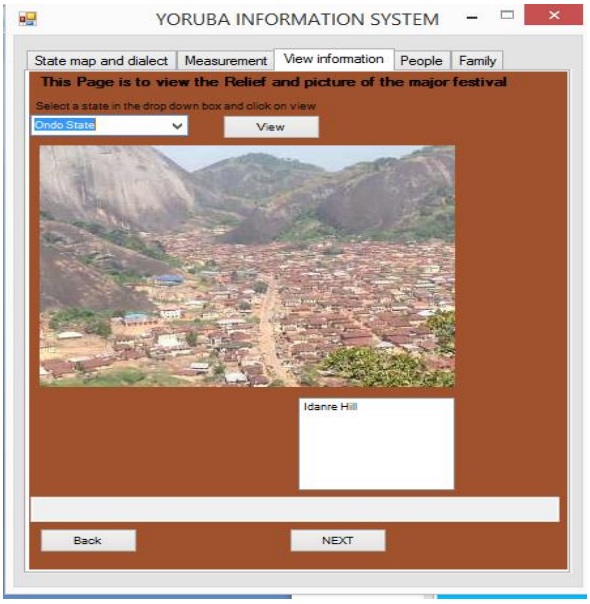

Figure10: Relief and major festival of the various state

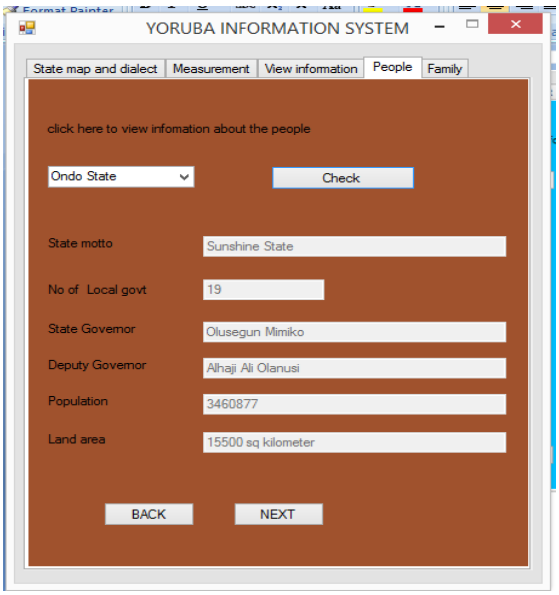

Figure 11: The State details

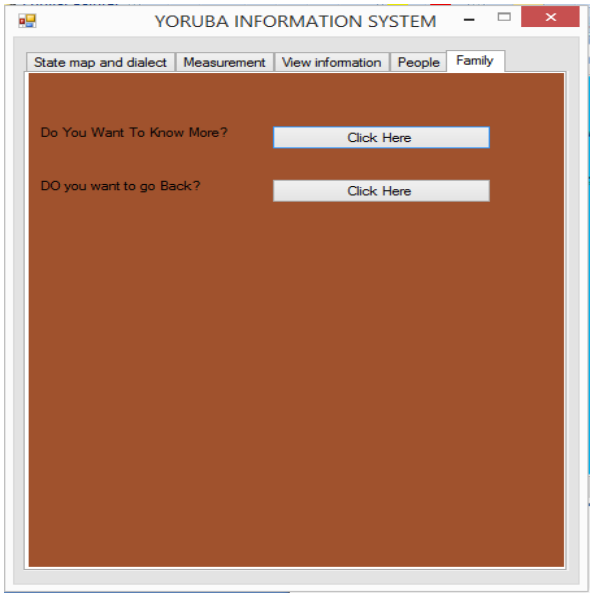

Figure 12: Request page subject to users response

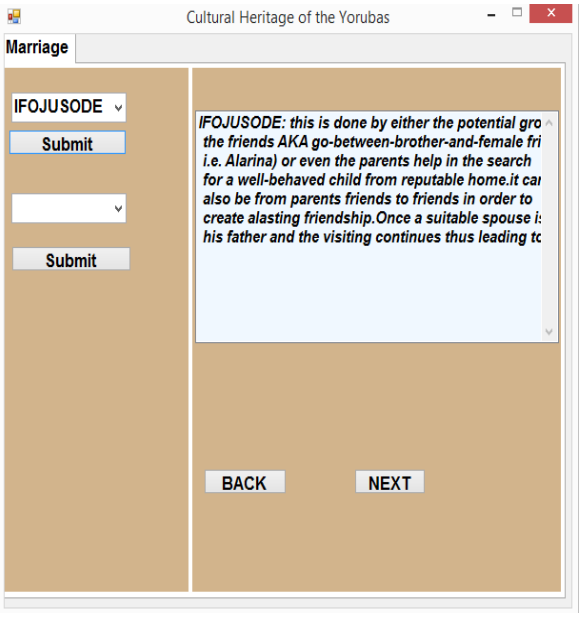

Figure 13: The Marriage steps

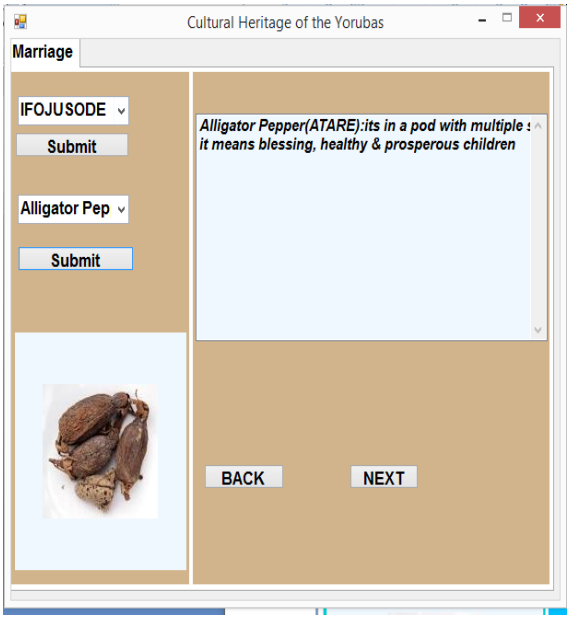

Figure 14: The Marriage items

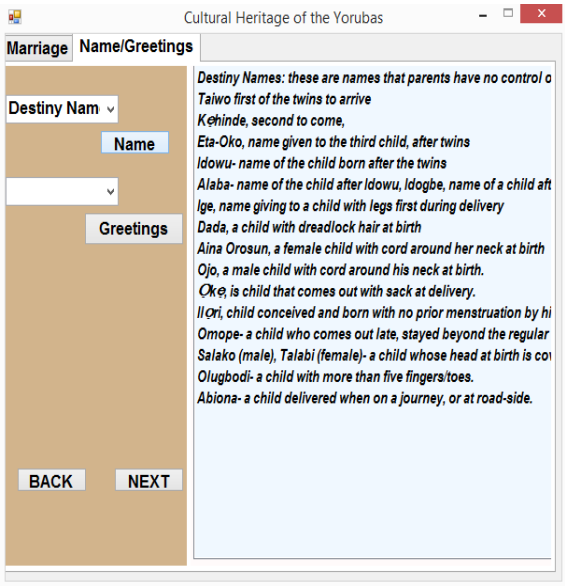

Figure 15: Yoruba Names based on categories

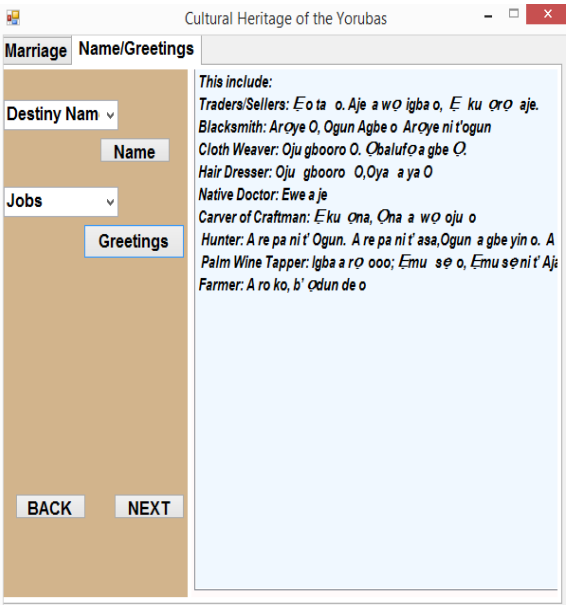

Figure 16: Yoruba Greetings based on categories

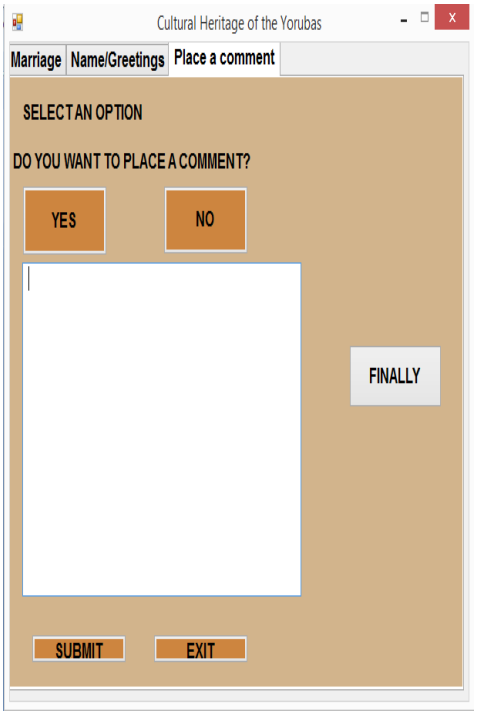

Figure17: Place a comment page when user Click yes

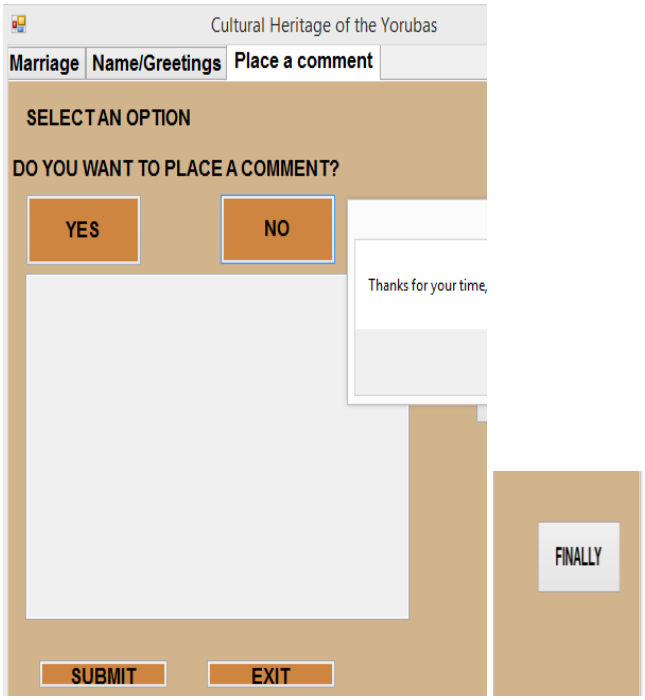

Figure18: Place a comment page when user clicks NO, encouragement for continuity of the culture

5. Summary and Conclusion

In this paper, we present a conceptual study and analysis of YCT with the aim of providing a platform that will bring about an antidote for the revival and restoration of the indigenous cultural traditional heritage that is almost going into extinction in Nigeria; also for the enhancement for a better understanding of the cultural relief of the Yoruba tradition. The public will be better informed on the Yoruba culture and thus reduce the rate at which students from the region in general are placing less emphasis on this all important issue (the Yoruba culture). This research work is limited to the development of information on the Yoruba culture which will enable users to get information about the Yoruba culture specifically on the language, the art (which include the genre), the family, marriage, cultural

relief and the people (which include their individual dialects) . The overall system works perfectly well under the set conditions and availability of the specified hardware and software requirements.

5.2 Recommendation

With the rapid advancement in the deployment of Information technology in many areas of life especially with respect to culture and tradition, it is recommended not just for teaching in the educational system that are affected by this cultural phenomena but also be used to facilitate future understanding and revival of the cultural heritage in order to avoid extinction of the cultural heritage, since we envisaged that many might have forgotten their background and is finding it difficult tracing their root. Therefore, it is expedient that measures be taking to teach the up-coming generation about their cultural heritage since they know little or no knowledge of their root because of western modernization. Also, more work should be done by integrating a web-based environment for the system's interaction. The maintenance of this system is necessary, which would aid in determining the strength and accuracy of the system especially in the sustainability of the YCT heritage to citizenry. Finally, the resulting model from this paper would help to sustain the YCT in Nigeria and Diasporas.

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