DESIDOC Journal of Library & Information Technology, Vol. 35, No. 2, March 2015, pp. 124-131 DOI: 10.14429/djlit.35.2.8396

Design and Development of an Online Exhibition on the Tangkhul Tribe Festivals

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ABSTRACT

Growth in information technologies in the area of multimedia, content production and the internet have opened new opportunities to online exhibitions, which could now hit on the exciting medium of world wide web (WWW) to make these exhibitions more reachable to people anywhere on the globe. The WWW is a vibrant place and has emerged as, an educational tool in today's instructive environment. An online exhibition on 'Tangkhul Tribe Festivals' was developed using web design tools following 'Prototype Development Method'. While developing an online exhibition, one has to keep the basic objectives of the HCI (human-computer interaction) in mind. Top priority should be given to the user interface design and related issues. The main purpose of this paper is to design and develop an online exhibition on 'Tangkhul Tribe Festivals' and evaluate the same with its real time users so that gaps or drawbacks could be identified. An evaluation study was carried out using a questionnaire tool with closed-ended and opened-ended questions. The evaluation of this exhibition reveals that majority of the users are very much comfortable with the HTML version of online exhibition.

Keywords: Online exhibition, user interfaces, user interface design, evaluation method

1. INTRODUCTION

Shift from the physical to the online format has provided the visitors an altogether different understanding and experience that is not offered by the physical medium. Online exhibitions present useful and cost effective solutions when time, distance and space are limited. Instead of being open to the public at certain times of the day, they are available round the clock via internet, i.e., 24x7. An extra benefit is people need not travel all the way to the exhibition site to see it. Online exhibition is distributed right up to their homes and classrooms or everywhere via internet. The maintaining cost can be cut by keeping those objects in digital form. New materials can be added easily, while existing materials can be updated with less effort. This lessens the time and avoids costly physical space required to mount an exhibition. An online exhibition can display through internet which is accessible to everyone and reach beyond physical exhibitions. Online or virtual exhibition is the best way of disseminating information in digital form.1

Remarkable advancement of the internet was introduced during 1990s. Change from the physical to the online presentation has offered the visitors an overall diverse acceptance and experience that is not available in the physical medium. Exhibition comprises of commercial and non-commercial exhibitions. Physical exhibition communicates directly with the visitors whereas online exhibition can be viewed from anywhere and anytime via internet connection. Through exhibition maximum exploration of occasions and events can be done. Exhibitions act as a bridge between the anticipated audience and an organisation. For any exhibition user interface play an important role for successfully delivering its output.

1.1 Information About Tangkhul Tribe Festivals

The Tangkhul tribe is one of the oldest and principal tribes in Manipur and is located in Ukhrul district. The Tangkhul tribe is well known for their colourful dresses and costumes, and for their lively folk dance and music. Light and dark brown is a formidable color combination that easily identifies the Tangkhuls from other tribes. Even before the arrival of Christianity, the Tangkhul tribe believed in the existence of divine being and its power over humanity or nature. According to them, Reisangchonmi is the creator of universe, Kameo refers to spiritual being, Ameowa is the master of all spiritual beings and Varivara is the almighty God[2].

Received 2 February 2015, online published 20 March 2015

Every step of cultivation process, there is an accompanying form of ceremony or ritual and celebration. The major festivals celebrated by contemporary Tangkhul are[3]:

(a) LUIRA—This festival is celebrating during the period of January to March months. It is a seed sowing festival and virgin dance is present in this festival. This festival is celebrated with dedication at Longpi (name of village) and Hungpung (name of village).

(b) YARRA—This festival falls in the months of April to May and called as anti-cultivation festival. This festival is widely celebrated by youth.

(c) MANGKHAP—It is a festival of post-plantation and is celebrated in the month of July. This is a festival of asking for timely rain to have a fruitful harvest.

(d) DHARREO—It means plucking of the new crop is celebrated at pre-harvest time. During this festival, first crop come out of the fields are sold during this festival.

(e) CHUMPHA—This festival is celebrated as a thanksgiving for fruitful crop. The mother undertakes offerings to the God of crop and the guardian of the storeroom. It is celebrated in the months of November and December.

(f) THISHAM—It is celebrated as a remembrance to the dead in the month of January. This festival marked the end cycle of the year and final ceremony is done for the dead[3].

1.2 Benefits of Online Exhibition on Tangkhul Tribe Festivals

Some advantages of online exhibition are:

- The contents of an online exhibition are useful for the school students, academics researchers, teachers (and who can use the content) for their educational and research works.
- This online exhibition will increase the public awareness about the rich Tangkhul tribe festivals.
- To brings out the historical background and importance of Tangkhul tribe.
- To possesses new knowledge and skills in the use of technologies and tools for online exhibitions.

2. METHODOLOGY

Methodology is a distinctive hypothetical investigation to an area of study. It is connected with a subdivision of information and comprises ideas such as pattern, hypothetical prototype and stages of development.

The online exhibition design and development can be considered as a software engineering project, because the final output is 100 % software-based[4]. In the design and development of a project there are following four major stages/phases:

(a) Requirement analysis: It defines the target user population, examining the user's needs, setting the objectives of the system, determining user tasks to be performed, getting familiar with the environment in which the system will operate, and also understanding the constrains in which the system will be implemented.

(b) Design: It helps in preparing the system design specifications document from the user's requirements. Design must be an integral part of the online exhibition, to make the website effective.

(c) Implementation: Implementation translates the design specifications into the final working product.

(d) Testing and user evaluation: Testing and user evaluation are quality control mechanisms in which the final product confirms to the software requirements specified in the design document. Here the final product confirms to the user requirements and also meets their expectations.

2.1 System Development

A structural approach is necessary in the design and development of a system because the user requirements and the system complexity increase in the process of project development. An appropriate development model may be used, taking into account the nature of the software project and strategies needed to meet the user's expectations and needs. The major system development models are: (a) Cleanroom Model; (b) Component-based model; (c) Hacking model; (d) Incremental model; (e) Prototyping model; (f) Spiral model; and (g) Waterfall model.

The model selected for this project is 'Prototyping'. It is one of the development methodologies used to develop online exhibitions. Prototyping is a new and continuously emerging methodology to software development. The advantages of prototyping development methodology[5] are:

- Users play a critical role in the development
- User can understand the system as prototyping development is an operational method.
- Mistakes can be identified with ease
- Reaction from user is received at early stage thus leading to development of improved system
- Important menus can be recognised and;
- Identifying unclear and problematic menus is easy

Since, user's requirements study was not done before or not clear to the researcher, the same was taken from literature review. Therefore, prototyping model was chosen for the development of this project. Initially, the project was started with story boarding which is a graphical depiction of the outward appearance of the intended system, without any accompanying system functionality. These prototypes helped to get the inside mind of the users in a better way. Adobe Dreamweaver CS6, is used to build a quick prototype which was tested with the real users. The mockup prototypes provide better interactivity, and helped the user to express his/her ideas more clearly. To modify the prototype, user's inputs are used and this process continued iteratively as a cycle until an acceptable prototype is finally achieved for the complete system or product is developed.

2.2 System Evaluation

Evaluation is to find out what users want and what problems they experience while using the system[6]. Evaluation is the process by which the interface is tested against the needs and practices of the users. In evaluation, the attitudes of the users toward the system are measured based on their feedback. The possible approaches for evaluating the design are: (a) Cognitive walkthrough approach,(b) Heuristic evaluation, (c) Review-based evaluation,(d) Questionnaire,(e) Observation of task performance and, (f) Co-operative evaluation.

Heuristic evaluation technique combined with questionnaire is used for the evaluation of the online exhibition system. Heuristic evaluation technique is used for evaluating the design phase while questionnaire-based survey method was used to evaluate during the implementation of the system. The purpose of choosing the heuristic evaluation technique is to evaluate the early stage of design, so that it is easier to fix many usability problems that are identified, provide quick and relatively inexpensive feedback to designers, and can test potential usability issues. There are ten principles in heuristics evaluation technique. Not all the heuristics were considered while designing the system, the main and the essential heuristics that play a vital role on the human computer interaction (HCI) have been chosen[9]. Those principles include: Speaking the user's language, simple and natural dialog, making information appear in a logical order, minimise the user's memory load by making objects, actions, and options visible, easily retrievable, flexibility, efficiency of use and aesthetic and minimalist design,etc.

Questionnaire tool was used to get the user's feedback directly and to reveal issues, which have not been considered during the design phase. Questionnaire is an inexpensive and simple; responses are gathered in a standardised way and relatively quick to collect information.

3. DESIGN AND DEVELOPMENT

User is the centre of the design universe and the design decision should aim to make the user's tasks easier. The design of the online exhibition was based on the user requirements. There is a need to understand who the users are, what task they will perform and how they will be using the exhibition[10].

3.1 Design

In this online exhibition, content was considered first, the layout appearance was second, and the navigation was the last. Design issues concerning to the online exhibition include interfaces design, content coverage, and organisation, system structure, and screen layout was used in the design.

3.2 Interface Design

Nowadays, most of the systems support higher resolution, i.e., 1366 x 768 pixel resolution, so the same was used in designing this online exhibition. A mixture of image, audio and video elements were used keeping in mind that user wants an interactive HTML web interface. Each image could be zoomed into a detailed image by a click on it. The Tangkhul tribe festivals online exhibition contains audios, videos and more than 70 images in all the festivals.

3.2.1 Information Organisation

The festivals are given in chronological order with respect to month in which the celebration was starting form Luira (January) to Thisham (December)[12]. Drop-down menus are provided in festivals page, which is hierarchical and yet sequential in the order of period of celebration. In this exhibition, hyperlinks are also provided to other webpages, following associative structure (Fig. 1). This online exhibition has got six functional sub-panels represented on the home page. The functional panel of the festivals is further divided into sub-sub-panels. The panels are organised as follows (Fig.1):

(a) Home panel—welcome the user and provide a list of festivals, with helper links to the corresponding pages.

(b) About panel—describe the aim and objectives of developing Tangkhul tribe festivals, an online exhibitio copyright and acknowledgements.

(c) Festivals panel—it is further divided into four sub-panels, i.e., occasion, season and duration, entertainment, costume and objectives.

(d) Gallery pane—consists of images, audios and video.

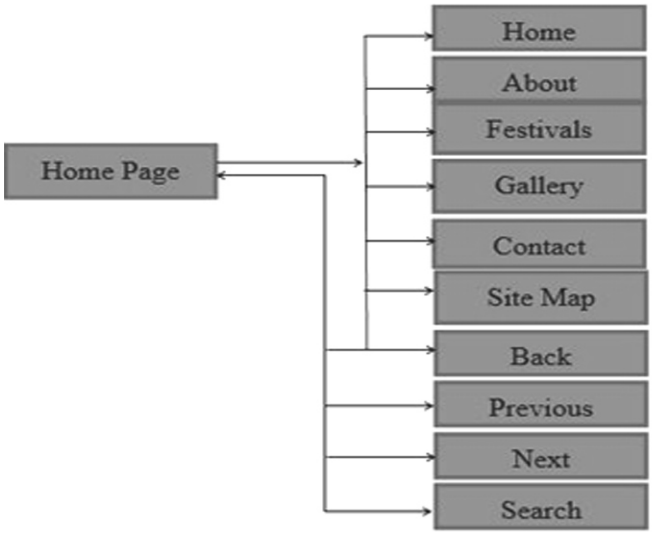

Figure 1. Navigation structure of the exhibition.

(e) Contact panel-consist of developer's contact details.

(f) Site Map panel-provides complete structure of the website to the users.

To help the users in identifying the functions of the icon when the users move the mouse over the icons, they display its functionality. Unidirectional arrows indicate sub-panels whereas bidirectional arrows indicate navigational panels.

3.2.2 System Structure

Navigational design has been given top importance while constructing the site. Introduction page provide background to Tangkhul tribe and festivals celebrated festivals celebrated by contemporary Tangkhul.

The first pull-down menu entitled 'Home' welcome the user and provides a list of festivals names and by clicking each menu link takes user directly to respective festival. This page welcomes the users to Tangkhul Tribe festivals online exhibition (Fig. 2). This page gives information about the purpose of the exhibition and each exhibition includes text, photographs, audio and video on Tangkhul Tribe festivals. Luira festival is shown in the Fig. 3.

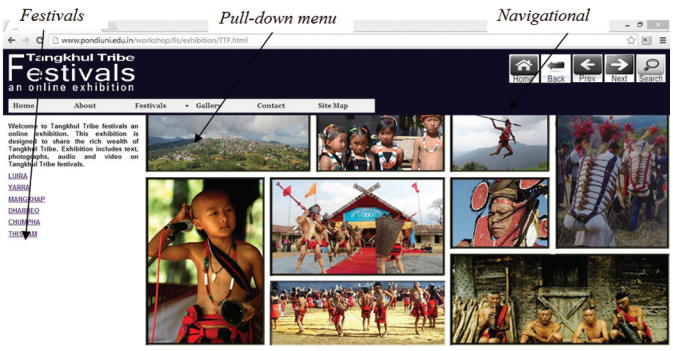

Figure 2. Home page of Tangkhul tribe festivals.

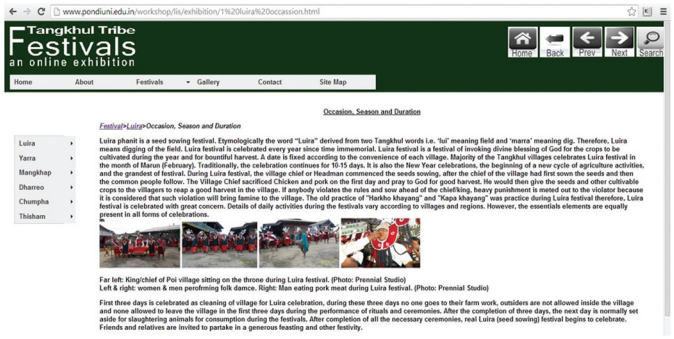

Figure 3. Luira festival.

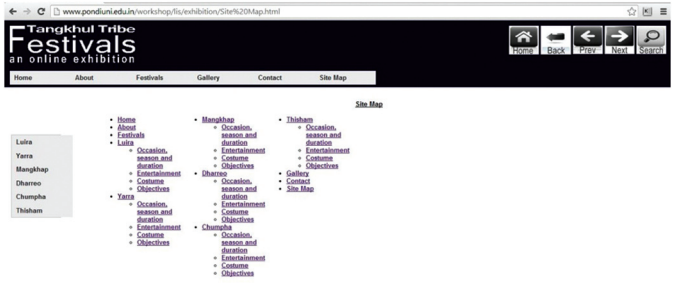

Figure 4. Exhibition site map.

The sixth sub-exhibit entitled 'Site Map' panel (Fig. 4) provides the users the complete structure of the website. Through Site Map, users will be able to easily access the online exhibition and find out the required information.

3.2.3 Screen Layout

Screen design guidelines and the screen size is limited to one to one and half screens size. Lengthier pages are avoided by splitting the screens into smaller chunks wherever possible. All webpages are provided with a consistent top navigational panel throughout the website. Drop-down menus on 'Festivals' panels are arranged in hierarchical order to avoid users getting lost problem. Navigational icons are provided at the top most right of each page to give a clear and consistent flow. Icons such as 'Home', 'Back', 'Previous', 'Next' and 'Search' are provided together at the top right-hand side as navigational panel.

3.2.4 Implementation

After completing the design and development phase, it was hosted on Pondicherry University website at http://www.pondiuni.edu.in/workshop/lis/exhibition/Index.html. Some preliminary tests were done during the development stage to minimise errors. However, due to time constrain many features were not incorporated at the time of evaluation.

4. EVALUATION OF ONLINE EXHIBITION

Evaluation helped to identify the inadequacies in the design and development of the system and understand the strengths and weaknesses of the

online exhibition. Evaluation was carried out using survey method and questionnaire tool to evaluate this exhibition. A questionnaire was prepared and distributed to 50 participants that is one-fourth of total North East students studying in Pondicherry University comprising of Humanities, Science, Engineering and Social Science.

4.1 Personal Profile

Of the total respondents, about half (46 %) of the respondents were from science background, over a fifth are (22 %) from Social science, 18 % from other subject backgrounds, 8 % from Humanities, and the reaming 6 % from Engineering. The majority of the respondents (56 %) had basic computer experience, 28 % had moderate computer experience, and 16 % had advance computer experience. The prior domain knowledge helps to users to do the tasks quickly, use the system optimally and also helps in giving constructive recommendations.

4.2 Interface Design

The questions covered in the interface design include text readability (font size & style), appropriate use of colours, appropriate use of icons and buttons, site attractiveness and user friendliness. The various ratings on the Interface design issues are tabulated below in Table 1. Of the total respondents, 84 % had rated Good and above for the text read. Of the total 14 % of the respondents' rated acceptable where as a small percentage (2 %) rated as poor readability. Overall, the majority of the respondents opinioned that the text was very clear so there is no need to change.

Most of the respondents were very comfortable with appropriate use of background colour as white background occupying almost total web page however, different colour backgrounds were given for different festivals for easy identification. Of the total respondents, 78 % had given 'Good' and above rating, a fifth (20 %) had given acceptable, and a small percentage (2 %) had rated the colour combination as poor.

The feedback on appropriate use of navigation icons and buttons was satisfactory; over three fourth (78 %) of the respondents rated as 'good', a fifth (20 %) of the respondents rated asacceptable, and a small percentage (2 %) of the respondents rated aspoor.

Out of the total respondents, 72 % had given 'Good' and above rating about the attractiveness of website. Respondents felt that the structure is very clear, simple and instinctive.

The Tangkhul tribe festivals online exhibition was built with simple and plain design, so more than half of the respondents found the website was user-friendly. The majority of the respondents were of the opinion that the website is very much user-friendly. Over three fourth (78 %) had given 'Good' and above rating, over a fifth (22 %) of the respondents had given as acceptable. They felt that menu provided on the left side was very helpful for browsing of the website. Hence, there is no need to change the user interface of the exhibition.

Table 1. Users rating to interface design

Design Issue/Rating	Very poor	Poor	Acceptable	Good	Very good
Text readability (font size & style)	-	2 %	14 %	62 %	22 %
Appropriate use of colours	-	2 %	20 %	48 %	30 %
Appropriate use of icons and buttons	-	2 %	20 %	44 %	34 %
Site attractiveness	-	4 %	24 %	34 %	38 %
User friendliness	-	-	22 %	50 %	28 %

4.3 Ease of Use

Of the total respondents, almost three fourth (74 %) had rated the exhibition as very much user friendly (Table 2). They felt that the overall design of the website was simple, clear and good. Since, the exhibition was built using HTML that enable user to access the website without any difficulties. The remaining 26 % felt that the website has to be improved to enhance the user- friendliness. The data given in the Table 3 shows the users response to ease of use of the online exhibition. Of the total respondents, 58 % had given 'easy' rating, 34 % had given average and 8 % of the respondents website was simple, clean and good. Since, the exhibition was built using HTML that enable user to access the website without any difficulties. The remaining 26 % felt that the website has to be improved to

Table 2. User friendliness of online exhibition

Rating/ Issue	Not User-friendly	1	2	3	4	5	Highly user friendly
User friend liness		-	8 %	18 %	46 %	28 %	

Table 3. Ease of use of online exhibition

Rating/ Issue	Very Hard	Hard	Average	Easy	Very Easy
Ease of use	0	8 %	34 %	42 %	16 %

enhance the user freiendliness. Table 3 shows the users response to ease of use of the online exhibition. Of the total respondents, 58 % had given easy rating, 34 % has given average and 8 % of the respondents had given hard. The overall rating of use is acceptable, owing to systematic organisation and good navigation support.

4.4 Content Coverage and Organisation

The festivals are given in chronological order with respect to month of celebration starting form Luira (January) to Thisham (December). Drop down menus are provided in festivals page, which is chronological and yet sequential in the order to period of celebration. They are also provided with hyperlinks to other web pages, following associative structure.

With regard to the organisation of information, the majority (78 %) of the respondents had given 'Good' and above rating however, 20 % of them felt that acceptable and 2 % felt poor (Table 4). This shows that content is in general acceptable to the respondents.

The level content coverage is very important to the readers of exhibition. Out of the total respondents, 76 % gave a good feedback on the content coverage. They felt that the content coverage is comprehensive, however, some respondents pointed out that there were too little details on few pages. Respondents also perceived the website is intuitive as the content is clear, precise, accessible, and consistent. They also informed that the related content were chunked and labeled properly, thus they can find and use information easily.

Table 4 shows the organisation of information and search facility provided in the online exhibition. Most of the respondents opinioned that finding information is easy because the various types of information are arranged in systematic order, continuity, consistency and connectivity was maintained in every web page to the relevant page. About three fourth (74 %) of the respondents had opinioned that 'somewhat agree' and above rating. Less than a fifth (18 %) and 8 % had given neutral and 'somewhat disagree' rating respectively. Some of the respondents were neutral with regard to easy in finding information, due to the absence of advance search engine. Due to time constrain, advance search engine was not able to incorporate at the time of evaluation. However, it is decided to incorporate a proper search engine later, which is capable of indexing not only text, but also multimedia elements such as images, audio, and video.

The majority (90 %) of the respondents rated the appropriate links to related site are available, 8 % and 2 % had given 'neutral' and 'somewhat disagree' ratings respectively.

The contents are organised in a simple, clear and easy manner. Outmost consideration was taken to provide all the valuable information on all the festivals. Out of the total respondents, majority of the respondents (78 %) had given 'somewhat agree' and above rating about value of link to related site. Only 12 % of the respondents are of the opinion that the link to related sites are 'somewhat disagree'.

Table 4. Organisation of information and search to related sites

Rating/ Issue	Strongly Dis-agree	Some what Dis-agree	Neutral	Some what agree	Strongly agree
Ease of finding Infor-mation	-	8 %	18 %	34 %	40 %
Appro priate links to related sites	-	2 %	8 %	22 %	68 %
Link to related sites are valuable	-	-	12 %	36 %	52 %

4.5 Navigation

Navigational design was given top importance while developing the exhibition. Where am I? Where can I go? How can I get there? How can I get back? This kind of questions was given outmost concern while designing navigation buttons. These questions covers in this section include information retrieval, navigation, ease of use, ease to understand and attractiveness of user interfaces (Table 5).

The majority of the respondents (74 %) had given 'Fast' and above rating about information retrieval. The users were able to retrieve the information quickly because the website was built only with HTML pages

Table 5. User feedback on navigation

Rating/ Issue	Very slow	Slow	Acceptable	Fast	Very fast
Information retrieval	-	4 %	22 %	56 %	18 %
Navigation	-	4 %	34 %	44 %	18 %
Ease of use	-	2 %	20 %	50 %	28 %
Ease to understand	-	6 %	16 %	50 %	28 %
Attracti-veness of user interfaces	2 %	4 %	28 %	42 %	24 %

without any animation and flash video clips which are normally difficult to retrieve. Over 22 % had given acceptable rating and 4 % of the respondents had given slow retrieval of information.

The respondents found that navigating throughout the site is reasonably easy. The entire navigation clues were given with image (icon) embedded with text label. Thus, majority of the respondents (62 %) had rated 'Fast' and above however, over a third (34 %) rated acceptable, and 4 % rated slow.

Of the total respondents, 78 % respondents found that the navigation buttons were easy to use. The respondents also stated that navigation buttons can be easily noticed and they did not face any major problems while navigating through different web pages using navigation buttons.

The majority of the respondents (78 %) found the navigation buttons were easily understandable. They can easily find out the navigation button without any difficulties. With regard to the attractiveness of user interfaces, 66 % had given 'good' rating and accepted the simplicity and uniqueness of user interface.

The Tangkhul tribe festivals online exhibition was designed and developed is simple and plain site. Thus 66 % respondents, had rated 'fast' and above about the attractiveness of exhibition interface. Over a quarter of the respondents (28 %) rated the attractiveness of interface as acceptable and below. They suggested that the attractiveness of the interfaces can be improved by adding animation and Flash movie clips to the interface.

4.6 Multimedia

The collection of multimedia elements such as images, audios and video, were important components of the website, was considered in this section. The questions included in this section are type of computers used for accessing this exhibition, type of browsers used to accessed this exhibition, quality of pictures and audio clips.

Majority of respondents (92 %) used the Windows operating system, a small portion (6 %) were not sure about their operating system, and 2 % used tablet to access this exhibition. Of the total respondents, 62 % used 'Google Chrome' browser to access this online exhibition, while 36 % and 2 % user used Firefox and Internet Explorer respectively. The majority of the respondents used Google Chrome as it is fast, simple, stable, has built-in Flash and PDF support for displaying sites and videos. However, irrespective of differences in browser usage, there was no problem in delivering the text and multimedia elements of the entire exhibition.

Most of the respondents found the images were reasonably viewable, 82 % of them rated as 'Good' and above (Table 6). However, some of them suggested adding high resolution images, which will enhance the quality of the exhibition.

Table 6. Feedback on pictures and audio clips

Rating/ Issue	Very poor	Poor	Acceptable	Good	Very good
Pictures	-	4 %	14 %	44 %	38 %
Audio clips	-	4 %	14 %	56 %	26 %

Table 7. General evaluation

Rating/ issue	Strongly disa gree	Some what dis agree	Neutral	Some what agree	Stron gly agree
Unique-ness of design	-	6 %	16 %	46 %	32 %
Site met my expect-ation	-	2 %	6 %	60 %	32 %

The majority of them found that the audio clips were acceptable and audible. Of the total, majority (82 %) of the respondents had given 'Good' and above rating.

4.7 Overall Design

This section of survey covers the general questions include uniqueness of design, the site meeting user expectation and any other information that is not covered in the questionnaire (Table 7). The majority of the respondents (78 % and 92 %) had rated the uniqueness of design 'somewhat agree' and above.

5. CONCLUSIONS

This paper presents an overview of design and development of an online exhibitions. Online exhibition's success largely depends on user's expertise in computers usage. User's computer experience will have advantage to get better experience of the exhibition. The HTML-based online exhibition on 'Tangkhul tribe festivals' fulfilled relatively most of the requirements of the users. Findings showed that users are interested in interactive exhibition, advance search tools to retrieve text, images, and audio-video. Another finding is lack of touch and feels capability. This could be achieved by using latest technologies like virtual reality, 3-D model augmented reality, etc. Nowadays, the majority of the online exhibitions are shifting slowly from static exhibition to virtual and interactive environments.

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