Applying Augmented Reality Technology to Promote Traditional Thai Folk Musical Instruments on Postcards

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ABSTRACT

This paper presents the use of augmented reality (AR) to distribute and promote Thai identity and culture. The first phase presents 11 Northeastern Thai traditional folk musical instruments such as Pong lang, Phin, Wode and Kaen. This method allows the user to view media as video, 3D modeling and original sound by using a trigger image in a postcard via their smart device. The researcher used the Aurasma application available on both iOS and Android from App Store and Google Play. After installing the application, the user needs to search for Auras or channel "IsanFolk" and Followers. After that the user can scan the trigger image placed on a postcard with a mobile device to view videos, 3D modeling and original sound. The results from the use of AR through user survey on both iOS and Android with Wi-Fi or a 3G connection via a smart phone or tablet showed that the samples expressed a highly positive level of opinion towards AR and they were interested because it is a new approach mixed with the presentation of Thai folk musical instruments. To conclude, AR is a challenging alternative which can respond to digital native audience and it can add a new dimension for arts and cultural conservation as well as other channels. The user could send postcard to members or friends domestically or internationally to listen to Thai music which is rare nowadays.

KEYWORDS

Augmented Reality, Thai folk musical instruments, Postcard

1 INTRODUCTION

The development of Augmented Reality is an important as well as interest area for the student in the 21st century because it combines real word with virtual world and it can be presented through various channels such as smart devices or tablets. The display presentation could contain still images, video clips, 3D modellings, animations as well as sounds, making it suitable for the development of educational material or the application with books and other kinds of published materials, depending on the kind of design. The development of educational media for instruction [1] could be done with books and textbooks by combining Aurasma with texts but the final output would be displayed on mobile phones or tables as multimedia containing animations, narrations, 3D modellings as well as touch screen interface to see the full screen version and to link to other dedicated resources. Augmented Reality is a suitable approach to instruction because it could generate interest before students engage with the lesson since at the beginning instructors would like their learners to be enthusiastic and curious about the subject matter. Moreover, instructors could apply AR in elaborating the knowledge so that the learners could develop their understanding and deepen their knowledge by linking the subject matter to other daily situations [2]. Therefore, Creative Learning could be achieved through new forms of technology.

According to the survey done by National Statistical Office in Thailand, there were 22.2 million computer users (35%) out of the population of 63.3 million persons. There were 18.3 million internet users (28.9%) and 46.4 million mobile phone users (73.3%) [3]. Moreover, the Thai government offered tablets to primary students to reduce the inequality in access to digital technology. Therefore, the application of IT to create and distribute knowledge is considered to be the most important asset for the national development in order to gain access to valuable resources of knowledge so that creativity, innovation and digital content and digital opportunity from ICT make it possible for the country to move towards Information Society in

terms of education, public health, entertainment, advertising, services, tourism and cultural aspects.

Digital data is an important asset for the continuity of ethnicity and culture. There are many data which show history about ethnicity, culture, arts as well as knowledge and wisdom scattered around in many parts of Thailand but have not been stored in a digital format, making it susceptible to loss or distortion unless there is a procedure to store and organize such data. The Digitized Thailand Project is aimed at collecting local wisdom. Its sub-project, Digitized Isan is aimed to local wisdom from the Northeast of Thailand, including the art of boxing, information about ancient buildings and the like. [4] However, folk music which is the main focus of this research in the AR format has not been stored in a digital format before.

AR is one of the most exciting technologies around. It is a creative Innovative and it work for Creating and Sharing to smart devices and another trend will be toward authoring tools and AR applications that make it easier to author and download for application development. The following is a name of AR applications that show 27 applications: Alive [5], ARPA [6], Augment [7], Augmentastic [8], AugRay [9], Aurasma [10], BEAR platform [11], BilppAR [12], ColAR Mix [13], Daqri [14], Fingo [15], GART [16], GiftAR [17], IN2AR [18], Junaio [19], Layar [20], LZRTAG [21], MINKO [22], ooh-AR [23], PendAR [24], Right on Target Media [25], STRING AR [26], VYZAR [27], Wikitude [28], WOWSOME [29], XARMEX [30] and Zappar [31]

The researcher aimed to use Aurasma application to apply Augmented Reality to distribute and promote Thai identity and culture, because the Aurasma is a platform that allows businesses and organizations to create and publish their own augmented reality content [10] and apply for Aurasma-powered apps

In the previous era, local materials were used to imitate the sound of nature, mountain, wind, rain and rainfall and these materials could create short sounds without an echo. Later, local materials were used as musical instruments, such as leaves, barks and bamboo parts, to reflect the sound of nature and these materials could create longer sounds. In the third period, hides and leathers were used as part of musical instruments to create melodious sounds and form a good shape as seen in Huen, Klong Kantrum, Wode, Salai pipe, Phin, Pong lang, Kaen and the rest [32]. Thai folk musical instruments are used as a recreational activity to relax after work in each local community and they could build harmony in the community. These practices have been done for many generations and they become their local identity and each part of Thailand usually has its own unique local identity. There are 11 Northeastern Thai folk Musical instruments as follows (see Table 1):

Table 1. Thai folk musical instruments (Northeastern) [33]

Name	Descriptions
Pong Lang	A type of melodic percussion, usually played alongside Kaen
Kaen	the most popular musical instrument among Northeastern Thai locals
Wode	A kind of vertical flute made of small bamboo pipes
Phin	A type of lute with a pear-shaped body
Pi Salai	A kind of double reed oboe accompanied with Kantrum ensemble
Jakae Kabue	An important instrument in Mahori khamen ensemble. It has 3 strings
Krachappi	A plucked stringed instrument with turtle shape sound box made of jackfruit wood
Saw Kantrum	A bowed stringed instrument with sound box made of wood and the head of it is coved with snake skin
Klong Kantrum	A kind of one-faced drum made of hollow wood with skin covering the face
Huen	A drum made of bamboo wood
Krab Khoo	A pair of hard wooden bars played by both hands

2 THE OBJECTIVES

The objectives are:
1) To Applying Augmented Reality to promote Thai folk musical instruments on smart devices
2) To increase digital opportunity and distribution for access to digital society
3) To create and find the most suitable technology platform for Thai culture

3 METHOD

The research methods was as follows:
1) Theories and related research works were reviewed.

2) Steps and procedure to create AR were studied to develop a case study of Northeastern Thai folk musical instruments.

3) Suitable approaches to the development of AR with a case study of Northeastern Thai folk musical instruments were analyzed.

4) AR was developed with a case study on Northeastern Thai folk musical instruments. The tools and the software related and the step implementation Augmented Reality (AR) were as follows (see fig. 1):

a) Recoding sounds Thai traditional folk musical instruments

b) Using Autodesk Maya 2012 was needed to export format from Open Collada or Autodesk FBX Collada Exporter which supports the following file extensions: DAE files for backgrounds and 3D models,. PNG files for textures and then used with7 Zip to archive 3D Modeling files into .TAR files, .MP3 files for sound, . FLV and .MP4 files for video clips.

c) Adobe Photoshop was used to design images with postcard size according to the type and number of Northeastern Thai folk musical instruments, used as trigger images (see fig. 2) .

d) Web to create and publish Aurasma content, which can be registered online (http://studio.aurasma.com) to access online content management system (CMS) in which users create Aurasma content/ interactive digital content, such as video, animations and 3D Model

e) Smart Devices, both iOS and Android with WiFi or a 3G connection via a smart phone or tablet, were used to scan trigger image by displaying AR outputs on the screen, which include videos, 3D modeling and original sound.

5) The sample ware students from the undergraduate level of the second year of age level between 19-20 years. A group of 45 students of new media department, Mahasarakham University, The sample was asked about their opinion towards the Media and the use of AR by surveying the opinion of the samples and they were chosen using purposive sampling method

6) The AR media was tested on both iOS and Android with Wi-Fi or a 3G connection via a smart phone or tablet. The display screen showed 3D modellings of musical instruments and folk music.
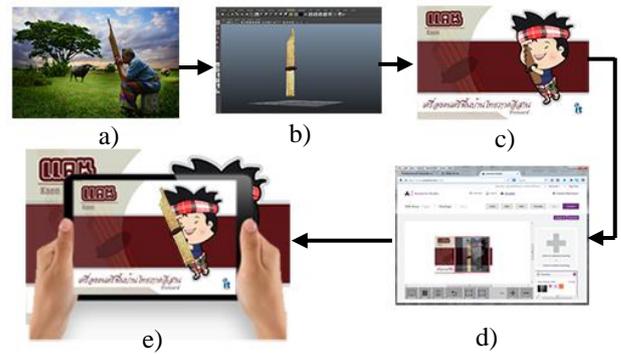

Figure 1. Shows the step of implementation AR Traditional Thai Folk Musical Instruments

The Aurasma application was downloaded and installed on Smart Devices of the user; the app is available on both iOS and Android from App Store and Google Play

Figure 2. Shows the design 1of 11 postcards to upload a trigger image

4 STUDY RESULTS

According to the development of Augmented Reality with a case study of Northeastern Thai folk musical instruments on smart devices on both iOS and Android system, the researcher designed postcards of 11 Thai folk musical instruments as use online content management system. Afterwards, they were uploaded with a Trigger Image, Video clips and 3D Models for Overlays and my channel called 'IsanFolk' was created so that users can browse or search the App for public access (public Channels are viewable for users).

The results from the use of AR by surveying the opinion of the samples (45 students) on both iOS and Android with Wi-Fi or a 3G connection via a smart phone or tablet were given below (see table 2.)

Table 2. Results from the use of AR by survey the samples' opinion

Aspect	$\bar{x}$	Interpretation
1) Enhancing knowledge about folk musical instruments	4.10	Good
2) Suitable and beautiful graphic displays	4.18	Moderate
3) Suitable video clips and sounds	4.30	Good
4) Suitable music and clear sounds	4.06	Good
5) Attractive 3D Models	4.20	Good
6) Suitable environments	4.11	Good
7) Creativity	4.20	Good
8) Virtual reality, pleasure and attraction	4.16	Good
9) Promoting Thai cultural conservation	4.73	Very Good
10) Suitable media through AR	4.05	Good
Total	4.20	Good

Table 2. Presents overall means and interpretations of the use Augmented Reality Technology to Promote Traditional Thai Folk Musical Instruments on Postcards.

The results from the use of AR by survey the samples' opinion showed that the samples expressed a highly positive level of opinion towards AR ($\bar{x} = 4.20$), the results are interesting are follow: 1) Promoting Thai cultural conservation 2) Suitable video clips and sounds 3) Creativity 4) Attractive 3D Models and 5) Suitable and beautiful graphic displays

The promotion and the distribution of local identity and culture through AR is a challenging alternative which can responds to digital native audience in terms of arts and culture through the use of postcards with musical instruments to other users so that they or any member could listen to these music and sounds through AR media.

5 DISCUSSIONS

Augmented reality has many applications and many areas can benefit from the usage of AR technology. This approach could be applied in various ways such as military, education, advertising, commerce, and entertainment areas as well. To develop Augmented Reality, the author used the free the Aurasma application available on both iOS and Android from App Store and Google Play. The first phase presented 11 kinds of Northeastern Thai folk musical instruments in the formats of video clips, 3D Models and original sound. The users expressed a highly positive level of opinion towards AR and they were interested because it is a new approach mixed with the presentation of Thai folk musical instruments. There are other research studies which incorporate Aurasma application as a way to add a new dimension to the presentation of posters or academic works in sciences and medical disciplines as well as in journals and textbooks in which readers can look at scientific data and techniques on their smart devices in the form of video clips and 3D environments [34]. There are also applications in the interactive exhibition [35]. Tesco also uses Aurasma application to help customers buy clothes in F&F via their smart phones [36]. The companies have begun commercializing AR applications in industries ranging from retail shopping experiences to print advertising to automotive driving assistance [37] and another trend will be toward tools that make it easier to author AR experiences and also to search and find AR experiences that might be useful [38]

6 CONCLUSION AND FUTURE WORKS

In this paper, the researcher aimed to Applying Augmented Reality Technology to Promote Traditional Thai Folk Musical Instruments on Postcards and to create and find the most suitable technology platform for Thai culture. However, AR media is a challenging approach to respond to digital native audience and it can add a new dimension for arts and cultural conservation. The Aurasma application can be applied in Augmented Reality in this case study of Northeastern Thai folk musical instruments in the first phase. The author is interested in developing more media to cover musical instruments from all 4 parts of Thailand as in Central, Northern, Southern and Northeastern Thailand.

Aurasma application could be downloaded and used without any charge. It is relatively easy to use and suitable for new AR developers. They could use AR to stimulate engagement in their classroom so that their learners are eager to know

more or they could use AR to elaborate the knowledge so that the learners could develop their understanding and deepen their knowledge. Alternatively, the developers could use AR to develop media according to their interest. In this study, AR is just one way to design images with postcard size according to the type of Northeastern Thai musical instruments to be used as trigger images and postcards to be sent to friends domestically or internationally so that people could watch and listen to Thai folk music which is rare nowadays and this could be seen through Augmented Reality.

7 ACKNOWLEDGMENT

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