The use of principles and elements design for designing mobile application to promote Indonesia culture heritage for digital Native

Meilani¹, J Witabora¹, K S Adidharma¹
¹ New Media Program, Visual Communication Design Department, School of Design, Bina Nusantara University, Jakarta, Indonesia 11480
meilani.dkv@binus.ac.id

Abstract. This research is about how the researchers use a new media approach to preserve Indonesia heritage to the next generation or digital native by using a mobile application to retain its existence. Digital technology is developing so fast and affecting the way people to see things differently by communicating with each other or seeking for some information. To help the digital native to gain any information regarding Indonesia cultural preservation, the researchers conducted questionnaire by collecting data from smartphone user to build the design interface for iOS and Android system. Results were implemented into two alternatives design using principle and design elements, although the outcome of interface design are visual aesthetically, the main problem it’s not about the design.

1. Introduction
With the numerous islands of each region in Indonesia that inherit different art and culture passed from ancestors over the centuries, it's so mesmerizing Indonesia had the diversity of art and culture that are well known in worldwide. But, in its journey, as the world enters modern civilization, almost in every country, the arts and cultures experience friction with new art and culture, as well as in Indonesia itself. Some forms of art and culture become extinct because eroded by the modern era, some still survive and even grow and melt with art and modern culture, nowadays the world give it a name as a contemporary art and culture.

According to Indonesian cultural expertise Koentjaraningrat, culture is the whole system of ideas and feelings, actions, and works produced by human beings in the life of society, which is his own by learning [1]. Culture is a pattern of human activities and the symbols that give these activities significance. It is what people eat, how they dress, beliefs they hold and activities they engage in. It is the totality of the way of life evolved by a people in their attempts to meet the challenges of living in their environment, which gives order and meaning to their social, political, economic, aesthetic and religious norms and modes of organization thus distinguishing people from their neighbors [2].

Heritage is our legacy from the past, what we live with today, and what we pass on to future generations. Our cultural and natural heritage are both irreplaceable sources of life and inspiration. They are our touchstones, our points of reference, our identity [3]. Cultural heritage refers to monuments, groups of buildings and sites with historical, aesthetic, archaeological, scientific, ethnological or anthropological value [3]. Prof Yalcin Karayagiz University Rector Mimar Sinan Fine Arts University, Istanbul while he gave speech in a conference at Turkey back in 2014, he noted that sustainably preserving cultural heritage via education is vital, via painting, film, architecture as well as other forms of art. And at the same conference, according to Dr Hass Dellal OAM Executive Director Australian Multicultural Foundation, the preservation of culture and heritage reflect and shape values,
beliefs and 5 aspirations which define who we are. It is important to preserve our culture and heritage as it keeps our integrity as people and the best way to preserve your cultural heritage is to share it with others. To sum up, cultural heritage is the identity of a nation that cannot be dematerialized at any cost because it will affect many aspects of civilization. It is necessary to preserve cultural identity to maintain nation story and history to the next generation or digital native.

In 2011, Prensky bring up the term of digital native and he elaborated digital native is a child who were born in digitalized era, growing up using technology like internet, mobile phones and other digital devices fluently [4]. Digital Natives are used to receiving information fast. They like to parallel process and multi-task. They prefer their graphics before their text rather than the opposite. They prefer random access (like hypertext). They function best when networked. They thrive on instant gratification and frequent rewards [4]. According to a survey conducted by the Association of Indonesian Internet Service Providers (APJII) in 2017, the highest percentage of internet users in Indonesia are in the 13-18 years old (75.50%), While the second largest users were 19-34 age group (74.23%), 35-54 years old (44.06%), and users over 54 (15.72%). 70.96% of users using smartphone and laptop to access internet [5].

Based on those data, we can use the advancement of technological development to socialize cultural heritage digitally. In the digital age, children and young people engage with multiple media such as mobile phones, the internet, digital television and game consoles in their everyday lives. Through their media engagement, they face new types of opportunities and risks [6]. Digital technology and computing increasingly become part everyday life through a myriad of digital devices [7]. Younger people tend to have smartphones, whereas older people tend to have more tradition mobile technology [8]. Mobile application is one of many ways to preserve cultural heritage in new media platform since the digital native are habitual with smartphone in their practical life.

2. Method
This study employs the qualitative method. A focus group discussion, open-ended survey and collecting data by sampling questionnaire. Conducted with 10 participants of millennial or digital native generation. To develop a design for a mobile application, all data summarized as a brief design for researcher. Starting from mind mapping from the keywords, the designs arise with 2 alternatives design. This research is also based on a literature study method as a source of information for this study to observe, developing the idea by adding more information stand on field observations and making a hypothesis as a conclusion.

3. Results and Discussions
Over the past two decades, the Internet and web have developed from a niche resource to a ubiquitous phenomenon, especially with the advent of mobile devices [9]. Through advances in technology and connectivity, we now have a revolutionary opportunity to enhance learning, creativity and innovation, and to reach new audiences worldwide, through the reproduction and sharing of works of art and cultural heritage (‘Works’) [10]. For cultural institutions that hold collections for the benefit of the public, the opportunity to provide open access now or in the future to works in a digital format is an exciting new frontier in their mission to preserve and transmit knowledge, culture and history for present and future generations [10].

Millions of digital files are being produced and stored on massive server farms; complex digital asset management systems are being constructed to control the flow of information, and website portals are being refined and tweaked; all so that museum professionals and the broader public of Internet users can access cultural heritage through digital copies [10]. The use of mobile devices is increasing dramatically in the cultural and museum sectors [9]. The history of cultural production is also a history of making copies. Copies have served to transmit knowledge and inspire new creation for millennia. Today, making copies has taken on new meaning and potential. 3D scans and high-resolution photography can not only be shared as never before, but they are also playing a crucial role in safeguarding against the destruction of cultural heritage [10].

Project start with field research to Gianyar, Bali in Indonesia to record visual data on Balinese masks. After the written and visual data of Balinese masks collected for mobile application content, researchers translate it into a sitemap to help user understand the flow of information. The sitemap for this mobile application is divided into three main pages: about pages, rituals, and dances. The
information focused on the rituals dances pages that refer to the types of masks from the collected data because the ritual dances stated the reason behind the mask creation and its existences. With so many types of masks to be exposed, the sitemap layout will be long down with a linear layout.

Next step is focus group discussion with digital native, to collect primary data to employ development stages for apps. Although the latest technology has a high enough resolution to display in full HD, to design an interface design for mobile applications is different from creating a website because we need to adjust the size of a smartphone or portable tablet resolution. On that concern, research use 13 principles that can be used as a reference in designing a good application interface: 1) Make display legible/audible, 2) Avoid absolute judgment limits, 3) Top-down processing, 4) Redundancy gain, 5) Discriminability. Similarity causes confusion: use discriminable elements, 6) Principle of pictorial realism, 7) Principle of moving part, 8) Minimizing information access cost, 9) Proximity compatibility principle, 10) Principle of multiple resources, 11) Replace memory with visual information: knowledge in the world, 12) Principle of predictive aiding, 13) Principle of consistency [11].

90% of the respondent didn’t have a apps related to cultural heritage and they are not willing to pay for the app if there are any. The main reason why they didn’t interest in cultural heritage apps because the design of the interface is not user friendly, outdated, not, lack of aesthetics, un-visual appealing as the color might so vibrant and vivid. To respond, researcher is using principles and elements design for designing a custom mobile application in a great hope that this project will give a solution in propagate the cultural heritage in Indonesia. The design creates based on primary and secondary data and the results lead to 2 alternatives design. Contemporary design by Jonata Witabora and classic style design by Meilani. Both are lecturers from faculty of Design Communication Visual, Bina Nusantara University.

![Figure 1. Design Results with Contemporary & Classic Style](image)

The design with contemporary style inspired by the pattern of Poleng or black and white grid as seen in chess board and were used as guide grid on the layout of this application. The Poleng pattern can be found in almost every corner of Bali, Pura, statues, clothes and so on. The philosophical meaning of Poleng pattern in cloth reflects good and bad energy (dualism), known as RwaBineda. Poleng cloth is used as a guard symbol and have such strong visual features that people easily associate them with Bali. The use of black, white and gray colors of the Poleng pattern as a supporting color affirms the visual power of the colorful masks and becomes in accordance with Balinese mask dance.

In the second visual reference, the design is approach with a classic minimalist style. Balinese is the largest adherents of Hinduism, and classic art in Indonesia is grown based on Hindu and Buddhist beliefs. From the study of colour theory, classic color is identical with the hue of light brown to dark orange. To employ a user-friendly and easily accessible platform, the minimalist layout is used to develop with warm display of colours, as well as the use of dominant white space. By using serif and san serif fontype, classical yet modern look still achievable and related for digital native. By applying drop shadows and reasonable gutters, it will create a naturally native look and feel.
4. Conclusions
The results of design were shown to the group, although it might meet their visual requirements by implementing the use of principal and elements design, it is best to follow the features of each operating system because each technology has its own advantages and disadvantages to complement a good eye-catching interface design. A further study on operating system are required for subsequent research to polish up the interface. The digital native born and live in a fast-changing world, the preferences of their taste, behaviour, references also changing rapidly. Not to mention the advancement of latest technologies. To sum up, to preserve a cultural heritage for digital native, it’s best to apply interdisciplinary studies across different curricular disciplines. We are living in a swifiting era, where all disciplines of studies equilibrate each other.

On notice, we might have a good design layout to share the cultural content. To widespread the knowledge about Indonesian art and culture, there are several methods can be used. Mobile applications are one of the media that can spread effectively and efficiently, and to put good use of mobile applications feature, we need a good along with a stable internet connection. The Internet has radically redefined sharing. Social networks, search platforms and sites like Wikipedia have made access to information, images and video instantly available to anyone with an Internet connection. One issue is about copyright and the ownership of digital copies. A second issue is about is about the digital divide: the fact that currently half of world does not have access to the Internet [10]. And what a pity, it’s also happened in Indonesia. 58.8% of internet user in Indonesia are in Java island [5].

References
[1] Koentjaraningrat 2009 *Pengantar Antropologi I* (Jakarta: Rineka Cipta) p. 72.
[2] Nwegbu M U, Eze C C and Asogwa B E 2011 Globalization of Cultural Heritage: Issues, Impacts, and Inevitable Challenges for Nigeria *Library Philosophy and Practice* p 674.
[3] UNESCO 2008 *World Heritage Information Kit* (Paris, France: UNESCO World Heritage Centre)
[4] Prensky M 2001 Digital Natives, Digital Immigrants *On the Horizon* 9(5) p 1
[5] APJII 2017*Penetrasi dan Perilaku Pengguna Internet Indonesia* (Jakarta: Teknopreneur Indonesia)
[6] Takahashi T 2011 *New Media Literacies in the Digital Age: cross-cultural research from US and UK* (Japan: Yoshida Hideo Memorial Foundation)
[7] Bowen J P and Giannini T 2014 Digitalism: The New Realism *EVA London 2014 Conference: Electronic Visualisation and the Arts*
[8] Beasley S and Conway A 2012 Digital Media in Everyday Life: A Snapshot of Devices, Behaviors, and Attitudes Part 1: Mobile Device Ownership *Museum and the Web 2012 San Diego 2012*
[9] Fantoni S F and Bowen J 2008 Mobile Multimedia: Reflections from Ten Years of Practice *Digital Technologies and the Museum Experience: Handheld Guides and Other Media* 1, ed L Tallon and K Walker (Plymouth, UK: Alta Mira Press) pp. 79-96
[10] Cormier B 2018 *Copy Culture: Sharing in the Age of Digital Reproduction* (London: V&A Publishing)
[11] Wickens C D, Lee J D, Liu Y and Gordon-Becker S 2011 An Introduction to Human Factors Engineering (India: PHI Publisher)

[12] Enyon R and Helsper E Digital natives: where is the evidence? British Educational Research Journal 36(3) pp 503-520