THE DEVELOPMENT OF CULTURAL DESIGN GUIDELINES FOR MOBILE APPLICATIONS FOR CREATIVE INDUSTRY DEVELOPERS

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SULTAN IDRIS EDUCATION UNIVERSITY

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THE DEVELOPMENT OF CULTURAL DESIGN GUIDELINES FOR MOBILE
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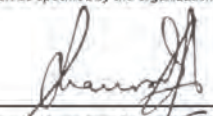
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ABSTRACT

In 2009, Malaysia introduced the "Multimedia Creative Industry" in the creative industry sector for digital product production. However, the main focus, which is the local cultural value that forms the basis of the sector, received inadequate attention, which leads to its erosion, especially in digital products. Therefore, this study aims to develop a mobile application design guideline for creative industry developers. This study uses a Design and Development Research (DDR) approach that goes through three main phases of the study, namely need analysis, design and development, and evaluation. A total of 23 experts in the fields of human-computer interaction, multimedia, and creative industry and three users have been involved. This research instrument consists of interview forms, questionnaires, and checklists. The Fuzzy Delphi Method used to obtain expert consensus values shows ten (10) elements and 29 design items that have been agreed upon. It consists of six (6) general design elements, namely (1) accessibility, (2) consistency, (3) ergonomic and minimalist user interface design, (4) readability and ease of recall, (5) efficiency and flexibility, and (6) error management. The other four elements are cultural design elements consisting of (1) suitable content, (2) aesthetic value, (3) language usage, and (4) absorption of local philosophical values. The results of three users; reviews of existing mobile applications using the design guidelines checklist form that has been developed show that only the general design elements of accessibility value as well as readability and ease of recall that gain visible its agreement of use visible. In conclusion, the design guidelines that have been developed are suitable for use and contribute to a high level of usability among users. The implications of the study show that the design guidelines that have been developed can also be used for website development and other appropriate digital products.

PEMBANGUNAN GARIS PANDUAN REKABENTUK BUDAYA UNTUK APLIKASI MUDAH ALIH UNTUK PEMAJU INDUSTRI KREATIF

ABSTRAK

Pada tahun 2009, Malaysia telah memperkenalkan "Industri Kreatif Multimedia" dalam sektor industri kreatif bagi penghasilan produk secara digital. Namun, fokus utama iaitu nilai budaya tempatan yang menjadi asas kepada sektor tersebut kurang diberi perhatian yang membawa kepada kehakisannya, terutama dalam produk digital. Oleh itu, kajian ini, bertujuan bagi membangunkan satu garis panduan reka bentuk aplikasi mudah alih untuk pembangun industri kreatif. Kajian ini menggunakan pendekatan Penyelidikan Reka Bentuk dan Pembangunan (DDR) yang melalui tiga fasa utama kajian iaitu analisis keperluan, reka bentuk dan pembangunan, serta penilaian. Seramai 23 orang pakar dalam bidang interaksi manusia-komputer, multimedia dan industri kreatif serta tiga orang pengguna telah terlibat. Instrumen kajian ini terdiri daripada borang temu bual, soal selidik dan senarai semak. Kaedah Fuzzy Delphi yang digunakan bagi memperoleh nilai konsensus pakar menunjukkan sebanyak sepuluh (10) elemen dan 29 item reka bentuk yang telah disepakati keperluannya. Ianya terdiri daripada enam (6) elemen reka bentuk umum iaitu (1) kebolehcapaian, (2) konsisten, (3) reka bentuk antara muka yang ergonomik dan minimalis, (4) kebolehbacaan dan kemudahan mengingat, (5) kecekepadan dan fleksibiliti dan (6) pengurusan ralat. Manakala empat elemen yang lain adalah elemen reka bentuk budaya yang terdiri daripada (1) kandungan yang sesuai, (2) nilai estetika, (3) penggunaan bahasa dan (4) penyerapan nilai falsafah tempatan. Hasil semakan tiga pengguna terhadap aplikasi mudah alih sedia ada, menggunakan borang senarai semak garis panduan reka bentuk yang telah dibangunkan menunjukkan hanya elemen reka bentuk umum bagi nilai kebolehcapaian serta kebolehbacaan dan kemudahan mengingat sahaja yang memperoleh kesepakatan penggunaannya yang kelihatan. Kesimpulannya garis panduan reka bentuk yang telah dibangunkan adalah sesuai untuk digunakan dan menyumbang kepada tahap kebolehgunaan yang tinggi dalam kalangan pengguna. Implikasi kajian menunjukkan garis panduan reka bentuk yang telah dibangunkan turut boleh digunakan bagi laman sesawang dan produk digital lain yang bersesuaian.

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LIST OF ABBREVIATIONS

CADG   Culturally Appropriate Design Guidelines

CDG   Cultural Design Guidelines

DDR   Design and Development Research

DIKN   Dasar Industri Kreatif Negara

FDM   Fuzzy Delphi Method

HCI   Human-Computer Interaction

ISO   International Organization for Standardization

UNESCO   United Nations Educational, Scientific and Cultural Organization

UNCTAD   United Nations Conference on Trade and Development

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Malaysia is heading towards becoming on the verge of technological advancement and attaining the status of a high-income country (Mat Ruzki, 2020). This technological advancement has covered various industrial sectors in Malaysia, including the creative industry, which at the same time showed good achievements in contributing to the Gross Domestic Product (KDNK, Keluaran Dalam Negara Kasar) (Bernama, 2020). This progress has also led to a change in lifestyle among the society of the world due to the access to information that can be obtained without limit just through the smartphone in their hands by using the mobile applications that are

available and can be installed through the Google Play Store or Apple App Store. It shows that technological progress has led society to a digital life. However, in keeping up with today's technological advancement, it is necessary to look at efforts to protect and preserve cultural values so that they are not lost and continue to be relevant in this advancement. UNESCO (2020) also stated the need for efforts to protect and preserve cultural diversity in today's technological advancement. Referring again to the creative industry sector, which is a sector that produces creative and innovative products that are based on cultural values, it needs to play a role in protecting and preserving cultural values in this technological era.

Objectively, the creative industry in Malaysia is an industrial sector that is based on cultural values by producing creative and innovative products that are commercialized through direct sales to consumers or intellectual property (DIKN, 2010; Razali et al., 2021). As a sector involved in technology, as well as one that is based on cultural values, the creative industry needs to consider the compatibility and harmony between technology and culture to protect and preserve cultural values, so they are not lost and continue to be relevant in this technological advancement nowadays. To meet this need, a human-computer interaction (HCI) approach is an excellent and relevant way of achieving compatibility and harmony. This is due to HCI focuses on the interaction between humans (users' needs) and technology to produce easy use that suits the user's target, such as human-to-human interaction (Dix et al., 2004). This study will look at the concept of usability in HCI in developing mobile application design for the creative industry in Malaysia that combines technological (General Usability Elements) and cultural design elements to obtain harmony to protect and preserve cultural values in today's digital era while also

impacting the high usability value of mobile applications (Bevan, 2001; Weichbroth, 2020).

This chapter discusses and states related concepts to this study. It begins by stating the research background that provides general information related to the creative industry in Malaysia. Next, this chapter will discuss the problem statements in the study that led to this study being done. Aside from addressing emerging problem statements, the chapter also discusses the study's goals and objectives. Participation in this chapter is to discuss related research questions that arise to achieve the research objective that has been established. In addition, the conceptual framework for this study is also mentioned in this chapter. Then, the operational definition, research limitations, and research significance are also discussed and stated in this chapter. This chapter, finally, closes with a comprehensive explanation of this chapter in the summary.

1.2   Research Background

In 1990, there was an idea to make culture and creativity something that can be used as an asset for certain individuals, groups, or organizations that have their own creative talents and as a contribution to the national economy (Anguelov, 2019; Banks & O'Connor, 2009; Moore, 2014). This idea has given birth to many different terms that are used to define something that is carried out, such as "creative sector", "content industry", "copyright industry", "creative business sector", "art-centered business", "experience economy", "media industry", "knowledge economy", and "cultural and communication industry" (Anguelov, 2019; Moore, 2014).

However, in 1994, a new term, "creative industry," was created, which was documented by the Australian state that year. This matter is taken as a step in making that country a "creative country" and to help the country create opportunities in the field of new information technology (IT) and the wave of global culture that is increasing because of digital media at that time. The term "creative industry" is used as a basis for cultural aspects, which also act as the basis for the country's economy (Australia. Department of Communications and the Arts, 1994; Moore, 2014; Rosenbaum, 2014).

In 2009, Malaysia issued one policy for the creative industry known as the National Creative Industry Policy (DIKN, Dasar Industri Kreatif Negara) (DIKN, 2010). This policy is to be used to empower the creative industry in Malaysia based on creativity and innovation, which can contribute to the country's generating a high-income economy and dignifying its cultural heritage (DIKN, 2010; Rais, 2011). In parallel with the need to generate the national economy, the creative industry today can be seen to be able to generate the economy at the same time by contributing to the Gross National Product (KDNK, Keluaran Dalam Negara Kasar) (ACPSA, 2018; Nadi Negara, 2020; UNCTAD, 2019). This can also be seen in other countries, such as the United States and South Korea, which generate national income from the creative industry sector (Ramsey, 2018).

Referring to the technological advancement nowadays, which has entered various industrial sectors, including the creative industry sector, in Malaysia, DIKN has established three main scopes for the creative industry policy in this country to meet current needs and demands (DIKN, 2010). Among the scopes created is the "Multimedia Creative Industry", which plays a role in producing creative and

innovative products digitally (Barker & Yuen Beng, 2017; DIKN, 2010; Tan et al., 2022). Table 1.1 shows the three main scopes of the creative industry in Malaysia that were introduced by the DIKN policy.

Table 1. 1.
Creative Industry Scope in Malaysia

Multimedia	Cultural Arts	Cultural Heritage
- Film. & TV	- Crafts	- Museum
- Advertising	- Visual Arts	- Archives
- Design	- Music	- Restoration
- Animation & Digital Content	- Performing Arts	- Preservation
	- Creative Writing	
	- Fashion & Textiles	

Source: Kementerian Penerangan Komunikasi dan Kebudayaan (2009)

Looking at the scope of the multimedia creative industry, it can be said that it focuses on producing creative and innovative products digitally (Barker & Beng, 2017; Tan et al., 2022). Revenue from products that apply technology, such as mobile applications, virtual reality (VR), augmented reality (VR), websites, and so on, falls under the animation and digital content scope (DIKN, 2010). With this scope, it has led to opportunities for creative industry activists to produce creative and innovative products digitally. With this, it can provide space and opportunity for them to work more widely using available technology (Bimantara et al., 2020; Omar et al., 2019).

The development of creative and innovative products digitally has led to new changes in the way to display creativity. For example, today, many people in the world use the TikTok application as a field for them to spread their talent, their creativity, their innovation, or share their culture (Hafiidh & Silviana, 2023; Mulyadi et al., 2022; Rahmana & Damariswara, 2022; Sulaiman et al., 2022). The use of this TikTok application can be seen in the improvement of its use to 672 million today (Statista Research Department, 2022). With this progress, things such as creativity,

innovation, and culture can be spread across borders and provide more information about things in today's world society.

The development of the world of technology today in the creative industry sector can be seen to provide many good contributions to the sector (Barker & Beng, 2017a; Nadi Negara, 2020; Tan et al., 2022). However, it is not appropriate to focus only on the digital aspect alone; it is also necessary to look at the cultural value, which is the main foundation in the country's creative industry sector, so that it continues to be relevant and does not lose its value in the current digital era. This is because today's cultural values are seen as having been eroded by the invasion of external cultural values that occur digitally and globally (Restu, 2022). This is to protect and preserve cultural values, which continue to remain today and are the identity and self-identity of an individual, community, or country (Ab Razak et al., 2022; M. N. M. Talib et al., 2022). This shows that the development of the world of technology today cannot ignore the cultural value that is the identity of a group or a country.

1.3   Problem Statements

The advancement of technology nowadays has changed the lifestyles of many societies, including those in Malaysia. This lifestyle change involves the nature of their thinking and activities in their daily lives. This progress has also led to the virtual invasion of the community's cultural values (Buang, 2005). It was also stated in the other study that the cultural values of society in Malaysia are still being invaded or have a negative effect with the advancement of technology today (Yusoff &

Hanafiah, 2015). The lack of cultural values among the people in Malaysia today can challenge various aspects of the country, such as socioculture, politics, and the economy (Mahmud & Pitchan, 2017). Cultural values are increasingly eroded with the advancement of technology today (Ab Rashid et al., 2019; Setiawan, 2018). This shows that the development of technology that happened and is happening has a negative impact on the lives of society, from the point of view of cultural values. This is because the development of technology nowadays is not in line with the efforts to cultivate, protect, and preserve cultural values in the lives of society.

It cannot be denied that today's technological progress also has a positive impact on the lives of world society in terms of various other aspects, such as access to current information (Mustafa et al., 2020). Accessing current information provides many benefits in society, for example, in preparing to face any specific needs following the information obtained, such as weather reports and others. The positive impact of advancement technology today can also be seen with the use of mobile applications for daily needs, which provide various facilities in the daily life of society, for example, access to CCTV at home to control their children's daily activities, access to current information through various applications, and more, which provides daily convenience in society's life. According to the Statista Research Department (2022), a total of 230 billion mobile applications were downloaded by users in 2021, which recorded an increase of 5.5% compared to the previous year. And the subsequent finding states that the use of gadgets today is spent on mobile applications by as much as 89% (BuildFire, 2021). This shows that today's world society focuses on mobile applications for their daily needs, such as accessing social media, playing games, and others. However, even though it gives a positive impact

from various angles in the life of today's society, it also needs to be seen from the perspective of impact on the cultural values of the society that act as an identity that affects the way of thinking, behavior, relationships among the society, and self-worth in the life of the society. This is because, as seen in this development, it has led to negative effects in society from the point of view of the value of life following the decline of cultural values in their daily lives. For example, in daily life that is focused on students, it is seen that the use of social media mobile applications has a negative impact on the way of thinking and life among students at both school and university levels (Abbas et al., 2019). Furthermore, efforts to protect and preserve cultural values in today's technological world are still under-intensified and need efforts to be intensified so that the cultural values of society are not lost due to the current modernity (Priyomarsono, 2021; Suparno et al., 2018). This effort is necessary to avoid the loss of cultural values in society today, which can lead to the loss of identity and morals in society (Azlina et al., 2021). Therefore, the emphasis on cultural values in technology needs to be reinforced to balance the technological and sociocultural progress at the core of today's society (Faiz & Kurniawaty, 2022).

Regarding the increasing use of mobile applications, researchers look at the guidelines that play a role and are used in mobile application development today. This is because the mobile application's development structure also affects users' value and level of usability (Yunandar & Priyono, 2018). The recent study results show that the existing guidelines today, known as usability guidelines, show the use of cultural design elements (Alwahaibi et al., 2022). Table 1.2 shows the status of cultural design elements used in existing guidelines.

Table 1. 2.
Cultural design elements in existing design guidelines

Elements	Nielsen	Schneiderman	CADG	ISO 9241
Local Elements			/	

Note: Local elements in this study refer to cultural design elements. The table is adapted from the study Alwahaibi et al. (2022)

Based on Table 1.2 mentioned above, it shows that local elements or cultural design elements are only used in Cultural Appropriate Design Guidelines (CADG) guidelines. This shows that there is still less use of cultural design elements in the existing guidelines that are used as a reference for developing mobile applications today. Another study, on the other hand, states that the use of cultural design elements has a positive impact on contributing to the usability value of the developed application (Alsswey & Al-Samarraie, 2021; Alwahaibi et al., 2022; Ariffin et al., 2018; Ariffin & Dyson, 2015; Srivastava et al., 2021). This shows that there is a need for the use of cultural design elements in the development of mobile applications nowadays.

Based on this requirement, researchers conducted a study that developed a design guideline called Cultural Design Guidelines (CDG) for mobile application development for creative industry developers in Malaysia. In line with the current needs of today's technological development, without ignoring the community's cultural values and the creative industry's role as a sector that plays a role in culture, with the aim and hope that these guidelines can purify the public's use of mobile applications or other digital content products by injecting cultural values that reflect the harmonious identity of Malaysian society.

1.4 Research Objective

As the creative industry continues to expand its digital presence, mobile application development becomes essential to engage with audiences and deliver creative and innovative content. However, what is urgently needed are Cultural Design Guidelines (CDG) that are explicitly tailored to mobile applications in the creative industry. This study idea aims to address the gap by proposing guidelines that will help developers and designers provide engaging and user-friendly mobile applications that resonate with audiences, enhance the user experience, and drive business success by incorporating general design elements with cultural design elements as efforts to protect and preserve cultural values. This follows the requirements of existing design guidelines that can be used in the development of mobile application design; currently, there is still less use of cultural design elements in them. Researchers have developed three research objectives for this study to achieve the main objective of the study. The three objectives developed are divided according to the phases in the Design and Development (DDR) approach used, which are Phase 1: Needs Analysis, Phase 2: Design and Development, and Phase 3: Evaluation. The three study objectives are as follows:

1.4.1 Phase 1: Need Analysis

RO1: To identify the design elements and items for mobile applications for creative industry developers in Malaysia.

The first objective of this study was to identify the need for the use of cultural design elements and to identify design elements and items with combinations of the general

usability design guidelines elements and cultural design elements from the existing design guidelines in developing these Cultural Design Guidelines (CDG). In this objective setting, researchers have conducted the Literature Review (LR) method to look at the need for cultural design elements in the development of mobile applications and an interview by an expert to seek the design guidelines elements and items that can be used in this study. The results of this study will form the preliminary design guidelines to be used in the design and development phases.

1.4.2   Phase 2: Design and Development

RO2: To develop Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia.

The second objective is to design and develop the Cultural Design Guidelines (CDG). The design and development of this phase involved 13 experts in looking at the consensus level of the experts' agreement in evaluating the elements and items found in the preliminary design guidelines that are appropriate and can be used to form CDG. This phase uses the Fuzzy Delphi Method (FDM), using a 5-point Likert scale. The use of FDM in this phase is due to the suitability of the method to get expert agreement and the advantages given in it (Beram, 2022; Mohd Jamil, 2007; Mohd Jamil & Mat Noh, 2021; Rahman et al., 2017; Siraj et al., 2020). The results of this study will form the prototype design guidelines to be used in the evaluation phase.

1.4.3   Phase 3: Evaluation

RO3: To evaluate the effectiveness and usability of Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia.

The third objective of this study is to evaluate prototype design guidelines based on the findings of the design and development phases. In this evaluation phase, researchers have conducted interviews with five experts in the field of study to evaluate the Cultural Design Guidelines (CDG). And in this phase, researchers have also added three users to evaluate the existing applications using the CDG that has been developed. The results of this study will form the final design guidelines that can be used in developing mobile application designs or as guidelines in evaluating the usability of any mobile applications for the creative industry in Malaysia.

1.5   Research Question

The research questions for this study were developed to achieve the three objectives that have been stated. The development of these Cultural Design Guidelines (CDG) for the creative industry developers in Malaysia is based on the current need to align digital content as a technology product for the creative industry with cultural elements, which is an aspect that is emphasized in the creative industry in Malaysia, with the focus of this study on the development of mobile application design (DIKN, 2010). The research questions developed are divided according to the phases of the Design and Development Research (DDR) approach used. Therefore, there are the following research questions that will be studied and answered through this study:

1.5.1 Phase 1: Need Analysis

RQ1: What is the need for the Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia?

The first research question in this study is to identify whether there is a need to develop CDG that contains cultural design elements to use for the development of mobile applications for the creative industry in Malaysia or not. The need for cultural design elements has led to this study being conducted.

RQ2: What design elements and items are required for the development of the Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia?

The second research question in this study is related to identifying the design elements and items that can be used in this study for the development of Cultural Design Guidelines (CDG) to use for the development of mobile applications for creative industry developers in Malaysia.

1.5.2 Phase 2: Design and Development

RQ3: How to develop the Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia?

The third research question in this study is related to how to develop the Cultural Design Guidelines (CDG) with a list of design elements and items that have been obtained from the findings of the first phase of the study (need analysis).

1.5.3 Phase 3: Evaluation

RQ4: How to evaluate the applicability of Cultural Design Guidelines (CDG) for mobile application for creative industry developer in Malaysia?

The fourth research question is how to identify whether the Cultural Design Guidelines (CDG) that have been developed are appropriate and worthy of being used by mobile application developers.

1.6 Conceptual Framework

A conceptual framework is a planned structure used to conduct a study (Kivunja, 2018). It is a thought from researchers on how to conduct the study to achieve the research objective and solve the problems that arise that led to this study being conducted (Ravitch & Riggan, 2017). This study uses a conceptual framework divided into three main parts: input, process, and output. The input part of this study refers to the needs of this study. The process part is related to the method used by researchers in this study. Finally, the output section refers to the study's results that meet the study's objectives.

In this study, researchers used the Design and Development Research (DDR) approach as a reference to carry out the study to achieve each objective and answer the research questions. In this DDR approach, researchers use a DDR approach that combines the second and third phases that make up only three of the original four phases. The three phases are: i. Needs Analysis Phase; ii. Design and Development Phase; and iii. Evaluation Phase. Each phase of the DDR approach used in this study

will use different methods (multiple methods) and be in line with the objectives of the study conducted by researchers (Beram, 2022; Mohd Jamil, 2007; Mohd Jamil & Mat Noh, 2021; Siraj et al., 2020).

In the first phase of the DDR approach, which is the need analysis phase, researchers will look at the need for this study to be conducted. Therefore, researchers conducted the literature review (LR) method as an input in the study to see if there is a need for cultural design elements to be used in the development of mobile applications. Researchers used an interview method involving experts to see if the views of the experts related to the design element and items used in the study as an instrument from the adaptation of the study (Ariffin et al., 2018; Ariffin & Dyson, 2015) were suitable for use in the study or not. The output of this phase forms three things in the study conducted, namely, i. the need for this study to be conducted, ii. design elements and items that will be used in the guidelines developed, and iii. the formation of preliminary design guidelines that will be used as instruments for the second phase of the study.

Next, the second phase of the DDR approach is the design and development phase. In this phase, researchers use the findings of the first phase (preliminary design guidelines) as an instrument for this study. For this phase, researchers used the Fuzzy Delphi Method (FDM) as the method used in the process section. This FDM method has involved 13 experts in obtaining consensus from experts related to design elements and items used in the preliminary design guidelines. The output of this phase will form prototype design guidelines that will be used for testing in phase three of the study.

And finally, the third phase of the DDR approach is the evaluation phase. This phase is a phase for researchers to evaluate and obtain confirmation that the guidelines developed by researchers are appropriate and worthy of being used for the development of mobile applications for the creative industry in Malaysia. For this phase, researchers used the expert interview method as a method for the process. The output of this phase will form the final design guidelines that can be used in developing mobile application designs or as guidelines in evaluating the usability of any mobile applications for the creative industry in Malaysia. And researchers have added the user interview, which involves three users as a sample to evaluate the existing mobile applications using the cultural design guidelines that have been developed to get their feedback on the existing mobile applications and the CDG that has been developed. Figure 1.1 shows the conceptual framework of the study to explain the study process.
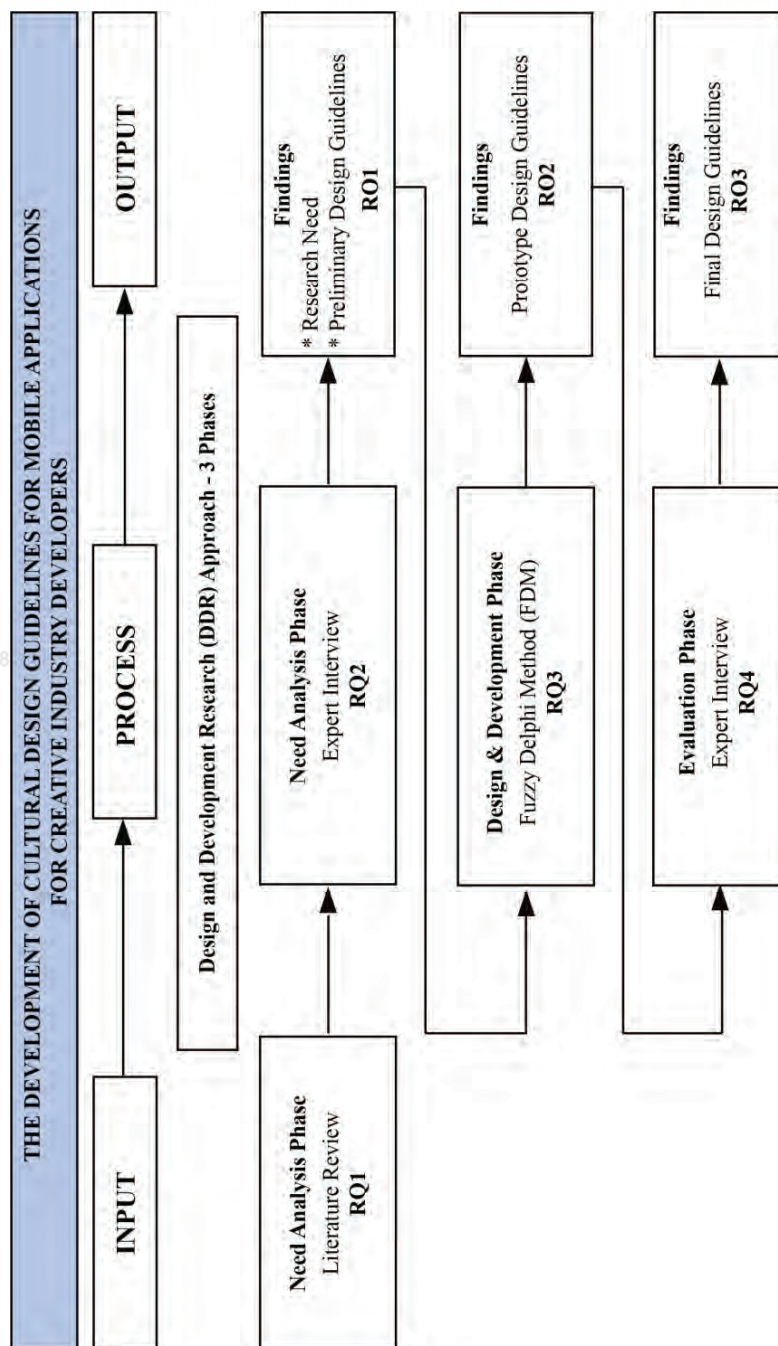
Figure 1. 1. Conceptual Framework of The Study

1.7 Operational Definitions

Operational definitions are essential details related to each term used in the study to help the reader understand the study conducted by researchers. It is also a definition from researchers on the use of terms in the study. This definition may be different from other studies because the meaning given according to the concept corresponds to the study being conducted (O. Talib, 2013). The following are some of the terms used in the study that explain their use according to their operational definitions:

1.7.1 Creative Industry

The term "creative industry" has various explanations and definitions from various parties. The term was first used in Australia in 1994 (Australia. Department of Communications and the Arts, 1994; Boix-Domènech & Rausell-Köster, 2018; Moore, 2014). The creative industry is often referred to as an industry that plays a role in culture and creativity (Boix-Domènech & Rausell-Köster, 2018).

This study focuses on the definition of "creative industry" from the perspective of Malaysia, which defines it as the production of something, the result of individual or group talents or abilities based on creativity, technology, and innovation that contribute to the national economy, and its production that is in line with culture and values (DIKN, 2010).

1.7.2   Cultural

Cultural is a complex concept to understand that encompasses the values, customs, beliefs, symbols, and practices of a particular group of people or society. Culture influences how individuals perceive and interact with the world around them (Avruch, 1998). Culture is not a static concept; it can evolve over time in response to various factors, such as technology and social and economic changes.

In this study, culture is focused on the creative industry sector in Malaysia, as it is one of the important sectors for producing economic growth and cultural proliferation in developed countries. For the creative industry in Malaysia, culture is value, identity, and art for the local society (DIKN, 2010).

1.7.3   Design Guidelines

Design guidelines refer to a set of principles or rules that designers can use to develop products or services. These design guidelines are used with the aim of ensuring that the developed design is usable, consistent, and attractivec(International Organization for Standardization, 2018; Nielsen, 1994).

In this study, the design guidelines that are focused on are for the development of mobile applications for products in the creative industry. The design guidelines in this study focus on a combination of general usability guidelines and cultural design elements to include cultural elements in the development of mobile applications for the creative industry.

1.8   Research Limitation

The study carried out in this study has research limitations that have been set and used to achieve the main objective of the study, which is to develop Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia. The research limitations for this study have been divided into three focuses, which are as follows:

1.8.1   Mobile Applications for Creative Industry

This study focuses on the development of Cultural Design Guidelines (CDG) for mobile applications for creative industry developers. CDG was chosen following the need to provide a guideline for the development of mobile applications that fit the development needs (International Organization for Standardization, 2018; Nielsen, 1994). This is also due to the existing design guidelines' lack of use of cultural elements (Alwahaibi et al., 2022). The cultural element is an important value relied on for products in the creative industry sector (Barker & Beng, 2017a; DIKN, 2010; Howkins, 2002; Rosenbaum, 2014). The selection of mobile applications as a product under digital content follows their increasing and widespread use in the daily lives of society (users) today (BuildFire, 2021; Statista Research Department, 2022). With the widespread use of mobile applications, the creative industry can use them as a platform to further spread and preserve the cultural values that are the foundation of the sector.

1.8.2   Design & Development Research Approach – Multiple Method

In this study, researchers focused on the use of several different methods (multiple methods) in the study. The selection of each of these methods is obtained by researchers from the results of reading the writings of scholars who use and discuss the use of the DDR approach in conducting studies (Beram, 2022; Mohd Jamil, 2007; Mohd Jamil & Mat Noh, 2021; Siraj et al., 2020). Following the DDR approach used in this study, it is necessary to go through three phases to achieve the main objective of the study. Researchers use a different method (multiple methods) for each phase of the study. For the first phase, researchers used the literature review (LR) method to determine the need to conduct the study (Cahyono et al., 2019). This first phase also uses the expert interview method to obtain a list of elements and items that can be used in the second phase of the study to design and develop the Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia. For the second phase, researchers used the Fuzzy Delphi Method (FDM) to obtain a consensus value from the experts involved on the list of design elements and items obtained from the first phase and used in the second phase. Finally, researchers used the expert interview method again to get an evaluation agreement from the experts and users involved that the design guidelines developed are appropriate and worthy of use. And in this final phase, researchers have added the Fuzzy Delphi Method (FDM) for analysis of the feedback and to get the consensus value for the CDG that has been developed from the users who have been involved as a study sample in this phase.

1.8.3 Expert in Research Field & Users

In this study, which goes through three phases for the DDR approach used, researchers have used the services of 23 experts in the field of study and three users as a study sample. This selection is due to the need for researchers to obtain data from an expert's point of view related to the study being conducted. The fact that experts were selected to be involved in this study is also because they have a deep understanding of and expertise in the scope of the study being conducted, which leads to the acquisition of data that helps increase the validity and realizability of the data (Farris et al., 2010). The selection of experts in the field of study as a sample for this study was also done following the recommendations given by scholars for the DDR approach used in this study (Mohd Jamil, 2007; Mohd Jamil & Mat Noh, 2021). And for the users, test the user's perception and usability of the existing mobile applications to see the impact of the Cultural Design Guidelines (CDG).

1.9 Research Significant

In the study conducted by these researchers have focused on the significance of the study for the creative industry. Following the needs and role of the creative industry in developing creative and innovative products based on society's cultural value resources Here is a list of the significance of the study for the creative industry:

1.9.1 Mobile Applications Designer

This study gives significance to mobile application designers in the creative industry by developing Cultural Design Guidelines (CDG) that contain cultural design elements for mobile application development. This is since the creative industry sector in Malaysia is a sector that plays an important role in producing products that are based on cultural values, as well as looking at the current need to protect and preserve cultural values in the technological advancement that takes place (Barker & Beng, 2017; Rosenbaum, 2014; DIKN, 2009; Howkins, 2002). The importance of this can be seen through the results of past studies conducted, which stated that the use of cultural design elements in the development of mobile applications leads to a better user experience that is more meaningful and interesting (Alwahaibi et al., 2022; Alsswey & Al-Samarraie, 2021; Srivastava et al., 2021; Ariffin et al., 2018). Looking at this, the mobile application designer can use the CDG that has been developed by researchers to develop mobile application designs that are relevant in terms of culture and attract the interest of various users, as well as protect and preserve cultural values in Malaysia. And to make a more attractive design with the combination of general usability design elements and cultural design elements.

1.9.2 Mobile Applications Developer

Mobile application developers can benefit from the study on the development of Cultural Design Guidelines (CDG) that contain cultural design elements. It follows that the use of CDG can help provide mobile applications that meet the objectives (needs of the creative industry) and user needs (International Organization for

Standardization, 2018; Nielsen, 1994). This is also in line with the current need to apply cultural design elements in the development of mobile applications to produce culturally relevant, inclusive, and attractive content for users from diverse backgrounds, as well as efforts to protect and preserve the cultural values of the local community in today's world of technological advancement (UNESCO, 2020). Mobile application developers can use these CDG to develop mobile application designs that contain cultural design elements and create mobile applications that are culturally sensitive and accessible to a variety of users.

1.9.3 Mobile Applications Evaluators

Usability evaluators play an important role in ensuring that mobile applications are user-friendly and accessible to a wide range of users. A study on the development of Cultural Design Guidelines (CDG) that contain cultural design elements is relevant to usability evaluators because it provides insight into how cultural design elements can impact the user experience. For example, a study conducted by Alwahaibi et al. (2022), Alsswey and Al-Samarraie (2021), Srivastava et al. (2021), and Ariffin et al. (2018) found that the use of cultural design elements in the development of digital content, especially mobile applications, can help create a more in-depth cultural and inclusive experience for users of these mobile applications. Usability evaluators can use this developed CDG to evaluate mobile applications that have been developed, especially in the creative industry sector, and provide suggestions for improvement.

1.10   Summary

As a conclusion, researchers can conclude that the writing for this chapter begins with a basic statement related to the creative industry sector from a global perspective as well as from a Malaysian perspective, which is the focus of the study. Next, researchers expressed the need to protect and preserve cultural values due to the problems that arise due to the current development of the world of technology today. For the problems that arise, researchers focus on the existing design guidelines that lack cultural values to be used as a guide and basis in the development of mobile applications. This is due to the focus given to providing mobile application products with cultural value that can contribute to the product as a platform for protecting and preserving cultural values among society (users) as well as contributing to the rate of increase in usability among users. Following this requirement, researchers have set three research objectives and four research questions that are built according to three phases of the DDR approach used to achieve the main objective of the study, which is to develop Cultural Design Guidelines (CDG) for mobile applications for creative industry developers in Malaysia. Figure 1.2 shows a summary of the research objectives and research questions for each phase of the DDR approach.
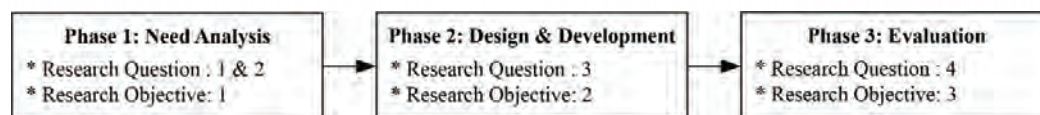
Phase 1: Need Analysis	Phase 2: Design & Development	Phase 3: Evaluation
* Research Question : 1 & 2	* Research Question : 3	* Research Question : 4
* Research Objective: 1	* Research Objective: 2	* Research Objective: 3

Figure 1. 2. Summary of Research Objectives and Research Questions

In the writing of this chapter, researchers also made statements related to the explanation of how this method is carried out through conceptual framework writing and made statements related to the operational definition to explain and give

understanding to the reader about the focus of use for certain terms used in the study. This chapter also discusses research limitations, the focus of the study conducted, and the importance of this study.

In the next chapter, researchers writing for this study state something related to the literature review conducted. In that chapter, researchers use it to express and explain more widely and deeply the matters related to this first chapter, as well as additional matters related to the study conducted.