The Development of A Mandarin Learning Mobile Application for Beginners

Ang Wan Xin\textsuperscript{1}, Syed Zulkarnain Syed Idrus\textsuperscript{1,2}, Wan Nor Ashiqin Wan Ali\textsuperscript{1,2}, Noormaizatul Akmar Ishak\textsuperscript{1}, Wan Azani Mustafa\textsuperscript{3}, Mohd Aminudin Jamlos\textsuperscript{3} and Mohd Helmy Abd Wahab\textsuperscript{4}

\textsuperscript{1}School of Human Development and Technocommunication, Universiti Malaysia Perlis, Perlis, 01000 Perlis, Malaysia.
\textsuperscript{2}Center of Excellence Geopolymer and Green Technology, Universiti Malaysia Perlis, 01000 Perlis, Malaysia.
\textsuperscript{3}Faculty of Engineering Technology, Universiti Malaysia Perlis, 01000 Perlis, Malaysia.
\textsuperscript{4}Faculty of Electrical and Electronic Engineering, Universiti Tun Hussein Onn Malaysia, Malaysia.

syzul@unimap.edu.my

Abstract. In the 21st century, Mandarin is spreading around globally and slowly competing with English. Many Mandarin learning applications, which focus on reading, speaking and listening, but not writing had emerged on market following the trend. Hence, there are Mandarin learners who can speak and read in Mandarin, but not in writing the words according to the correct sequence. This study is to develop a Mandarin learning application, which can increase the Mandarin proficiency of the beginners. This study helps the learners to understand the correct pronunciation and writing steps of Chinese characters. This application is effective in increasing the Mandarin proficiency of non-Mandarin speakers. Further research can be done by adding gaming elements to make the application more appealing and more interesting to use.

1. Introduction
Following the continuous development and the advancement of the technologies, China has become a country which brings a huge effect on the global market with the power that cannot be underestimated [1]. China has successfully proved that the position of the country is vital and undeniable in practically every aspect, especially during the 21st century in which the Industrial Revolution (IR) 4.0 has been started.

According to [2], IR 4.0 is a prudent strategy initiated by the German government. In fact, IR 4.0 is aimed to attain the demands of the individual customer in the aspects of order management, research and development, manufacturing commissioning, delivery up to the utilization and recycling of products [3]. [4] stated that the main concerns of Industrial Revolution 4.0 are the smart systems, smart production, as well as human in IR4.0 and their skills.
Following the introduction of IR 4.0, many opportunities have been created. [5] mentioned that the growth rate of China has soared sharply, so is its trade rate with the other countries around the world. Since China adopted an opening-up policy, the speed of the development of China’s economy has impressed the world because it shows that China is catching up with the developed countries [6]. During the years, China has built a strong foundation as a force that cannot be underestimated in changing the world by its world-class products and their advanced technologies which are seriously astonishing. Because of that, companies worldwide are eager to build a strong and unbreakable bond between them and the Chinese companies [7]. This is like a life insurance to them, because building a stable and long-term relationship with China can secure their future well [8].

Apart from that, China has been recognized as a country with a high quality of education [9]. People of China always value their education and consider education the most important element in one’s life. As one of the ancient civilization apart from the Mesopotamia civilization, the ancient Egypt civilization and the Harappan civilization, China has a long history in education, which began early in ancient time [10]. Confucius, a Chinese philosopher, regarded education as an important component of social development [11]. He had put a hard effort in spreading his knowledge, known as Confucianism, to the ancient society.

Due to the rich history of education in China, campuses and universities in China have been recognized by the students around the world as one of the most popular education centres. [12] stated that majority of the international students who study in China are from the neighbouring countries of China such as South Korea, Japan, Vietnam and Indonesia, but there were also some students who are from the USA and Europe. [13] mentioned that international students have chosen China as their destination to complete their studies because they found that the Mandarin is distinctive compared to other languages. This makes learning Mandarin a goal and a must.

However, in the 21st century, Mandarin is spread around globally and it is slowly competing with English [14]. Due to its widespread, the use of the Mandarin is no longer restricted to China, but it also can be used elsewhere in the world. Therefore, learning Mandarin has become more and more important in order to communicate with people around the world.

To learn Mandarin, some people will choose to buy textbooks or attending classes. However, in the era that technologies become more and more important, people prefer to use the Internet to help them in everything, including learning a new language because online education is largely expanding and is trying to replace traditional methods of teaching and learning [15-18]. This phenomenon can be proven by the flooding of Mandarin learning guide over the Internet. The biggest advantage of the Internet is people can access to it wherever they are and whenever they want.

One popular way that people learn something new with the aid of the Internet on their mobile devices is called “mobile learning”. Mobile learning can be defined as a way of learning using interactive technology [19]. They further explained that the way how mobile learning works is learners are involved actively in fascinating and practical learning processes with a lot of interaction and collaboration using their mobile device. In actual fact, mobile learning can be utilized in learning a language. Mobile Assisted Language Learning (MALL) refers to the utilization of mobile technology in language learning, has been introduced to people to provide them help in learning a language [20].

Thus, this paper is about creating a Mandarin learning mobile application which will help the people who does not received any formal education on Mandarin to master basic Mandarin through an interactive way which can boost their interest in this unique and beautiful language.

2. Methodology
In the process of developing the application, waterfall model is used to assist the researcher in creating a chronological study flowchart for the development of the application. The waterfall model is a static model used to illustrate the process of software development and it approaches systems development in a linear and sequential manner, completing one activity before the other [21]. It means that the output of the previous phase will be the input of the next phase, in a downward fashion like a waterfall.
2.1. User Interface
A user interface (UI) is the means in which a person controls a software application or hardware device. A good user interface enables users to have interaction with the software or hardware in a natural and intuitive method [22].

A user interface needs to have a user-friendly design. User interface designer focus on the appearance or style of a software or computerized device in the user interface design process [23]. Figure 1 shows the primary design of user interface of “mandarinbox” application. The first image is the start-up page, the second image is the theme page, and the third image is the learning page. Since these images are just the primary design of the user interface, changes are made after the development of the application is started.

![Image of user interface]

Figure 1: The primary design of the interface of the mobile application.

2.2. Process Flow Diagram
This section presents the process flow diagram of the Mandarin learning application that we developed. The users have to follow the steps in using the application.

Figure 2 shows the process flow diagram of the “mandarinbox” application. At first, the users are directed to the start-up page once they launched the application. A “Get Started” button is located at the bottom middle of the start-up page and the users have to tap the button to continue to the next page. Next, the users need to choose between “learn” and “quiz” sections. Once they choose “learn”, they are directed to an introduction animation, where they can learn about each tone in the “pinyin” system before making their way to the theme page. Once they have reached the theme page, there are six different themes, where they can choose from. Each theme consists of ten vocabularies. More themes and vocabularies are available after the maintenance process.

After choosing their desired theme, the users are directed to the learning page, which consists of the image, Mandarin pronunciation, writing steps, and sample sentences of a particular word. Next button, back button, and a button, which can go back to the theme page are provided to ease the operation of the application. After the users have finished learning all the vocabulary, they can tap the button to go back to the theme page, and then tap the back button located at the theme page to go back to the section page.

Once the users are ready to answer the quiz, they can tap on the “quiz” button located at the section page. After that, they are directed to another animation before directing to the quiz page. After tapping the “next” button, which is provided on the animation page, the users are directed to the page, which consists of the first quiz question. Currently, there are only ten questions, which are available in the application, and more questions will be added in the future.
Figure 2: The process flow diagram of the application.

When the users answered a question correctly, a “correct” page appears and when they have answered the question with wrong answer, a “try again” page is shown. After the appearance of the “correct” page, the users are able to go to the next question by clicking the “next” button on that page, while they have to re-answer the same question when the “try again” page appears. After they have finished answering all the questions, the users are directed back to the section page and they can exit the application after tapping the “back” button located on the section page to go back to the main page.

3. System’s Development
In the system development, there are several steps and processes involved. Figure 3 shows the start-up page of the application. The users enter the startup page when they launched the application. The first step that the users need to do is tap on the “Get Started” button at the bottom of the start-up page.

Figure 4 shows the section page of the application. After clicking the “Get Started” button, the users are directed to the section page. Users are required to choose their action, which is whether they want to learn basic Mandarin or take the quiz. The “learn” or “quiz” buttons can be tapped based on users’ preference. The users are then directed to different scene when they tap on each button. Two different animations are provided for each section, which will be shown below. Users can also tap the “back” button located on upper left to go back to the start-up page (Figure 3).
Figure 3: The start-up page.

Figure 4: The section page of the application.

Figure 5 shows the first scene of the introduction animation for the “Learn” section. The users are directed to this page once they tap the “Learn” button back in section page (Figure 4). The animation comprises four scenes, which are connected in a form of a short story. To find out what will happen next, the users need to tap the “next” button located at the bottom right, and they are then directed to the second scene of the introduction animation. The second scene of the animation is shown in Figure 6. In the second scene, users are required to tap on the magician’s hat in order to go to the third scene.

Figure 5: The first scene of introduction animation of “Learn” section.

Figure 6: The second scene of introduction animation of “Learn” section.

Figure 7 shows the scene, which contains the information about the tones in the “pinyin” system. This scene appears after the users tapped on the magician’s hat on the previous scene (Figure 6). After all the tones appeared from the magician’s hat, the users can tap on each tone to find out its
pronunciation. After that, the users need to tap on the “next” button located at bottom right to go to the next scene.

Figure 8 shows the fourth scene of the introduction animation for “Learn” section. This scene appears after users tapped the “next” button located in the third scene (Figure 7). This scene is created to act as the end of the first introduction animation. After tapping on the “next” button located at the bottom right in this scene, the users are directed to the next scene, which is the theme page.

Figure 7: The third scene of introduction animation of “Learn” section.

Figure 8: The fourth scene of introduction animation of “Learn” section.

Figure 9 shows the theme page of the “mandarinbox” application. The users are directed to this page after tapping the “next” button in previous scene (Figure 8). In this page, the users can choose the theme they wish to learn among the six themes available. They can choose among daily conversation, numbers, family members, body parts, colours, and fruit and vegetables. The users need to tap on the image of each theme to enter to the next scene as the images act as buttons in connecting the theme page and the learning page. A “home” button is located at the top right of the theme page to allow the users to go back to the section page (Figure 4).

Figure 10 shows the learning page of the application. The users are directed to the learning page once they have chosen a theme in the theme page (Figure 9). The learning page in this application consists of many scenes as there are six themes in this application, with ten words under each of the theme. In the learning page, users can listen to the pronunciation of Mandarin words and sentences by tapping the sound clip buttons provided. If they wish to learn the next Mandarin word, they are required to tap the “next” button located at the upper right of the page. Similarly, a “back” button is also provided so that users can go back to the previous scene of the learning page. The “bullets” button located at the bottom right is the button, which is linked back to the theme page (Figure 9). After users had finished learning a topic, they just have to tap on the “bullets” button to go back to the theme page, and then tap on the “home” button located at the theme page to go back to the section page (Figure 4).
Figure 9: The theme page of the Mandarin application.

Figure 10: The learning page of the application.

Figure 11 shows the introduction animation of “quiz” section. The users are directed to this page when they tap on the “quiz” button back in the section page (Figure 4). After they tapped the “quiz” button, another introduction animation, which consists only one scene appears. In this page, the users need to tap the “next” button under the rainbow in order to play the quiz.

Figure 4.12 shows the first question of the quiz. The quiz section in the “mandarinbox” application consists of ten multiple-choice questions, in which the users need to choose the correct answer among four choices. All the answers can be found in the learning material provided. There are four answers for every question, which the answer choices are converted into buttons for clicking. Once the users chose the correct answer, the “correct” page shown in Figure 4.13 appears. After that, the users can tap the “next” button to go to the next question. On the contrary, the users need to tap the “try again” button to answer the same question again once they have chosen the wrong answer, as shown in Figure 14. The questions included in the quiz are in various forms to test users’ knowledge.

Figure 4.15 shows the credit page of the “mandarinbox” application. This page appears after the users have finished answering all the quiz questions. By tapping the “home” button at the top left corner, the users are directed back to the “Learn” and “Quiz” section page (Figure 4). To exit the application, the users can simply tap the “back” button located at the top left corner of the section page to go back to the start-up page (Figure 3). After that, the users can exit the application by tapping “back” on smartphone.
Figure 11: The introduction animation of “Quiz” section.

Figure 12: The first question of the quiz.

Figure 13: The “correct” page of the quiz.

Figure 14: The “try again” page of the quiz.
4. Conclusion
A Mandarin mobile learning application is needed by the non-Mandarin speakers to improve their Mandarin proficiency. Without a Mandarin learning mobile application, non-Mandarin speakers may be wasting their time, money, and effort to take Mandarin courses. The objectives of this study are achieved because a Mandarin learning mobile application, which is effective in increasing the Mandarin proficiency of non-Mandarin speakers, had been successfully developed.

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