DESIGN OF ANDROID-BASED MUNA LANGUAGE DICTIONARY APPLICATION USING EXTREME PROGRAMMING METHOD

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Abstract— **Muna is one of the languages spoken by the Muna tribe in Southeast Sulawesi, Indonesia, which belongs to the Austronesian language family. Over time, Muna language began to be rarely used. Muna language learning in education also began to be rarely used and there are almost no Muna language lessons anymore, because people prefer to use foreign languages rather than using their own local languages. As a result, many people in the capital of Muna Regency do not understand or know the vocabulary of the Muna language. One way to preserve it is by utilizing existing technology through applications that can help search vocabulary as a substitute for conventional dictionaries that are large in size that can be carried and viewed at any time. Therefore, this research aims to preserve the Muna language through the design of the Muna language dictionary application by applying the Extreme Programming method. Extreme Programming method is a software development approach that emphasizes collaboration, flexibility, and responsiveness to change. The Muna language dictionary application will be designed with various features that make it easier for users to understand and use the Muna regional language. The Muna regional language dictionary application has also been tested using black box testing, where all the features in this application run well and in accordance with what is needed.**

Index Terms— **Muna language, application, dictionary, Extreme programing.**

I. INTRODUCTION

Language is a tool used by humans to interact with everyone in the world. It helps humans express or convey the information in their minds. Regional language, on the other hand, is a form of expression used to interact among specific regions only, making it impossible for other regions to understand languages from different areas[1]. In Indonesia itself, there are many regional languages, one of which is the Muna regional language[2]. Muna language has been used as a means of communication by the community in Muna Regency, Southeast Sulawesi, since 4000 BC. The estimated time of Muna language usage is based on the arrival of migrants from highland Greece, China, Austronesia, and Africa. The languages of the migrants assimilated with the local languages spoken by the inhabitants of Muna Island. From the fusion of these two languages, a new language known today as the Muna language emerged.[3].

The Indonesian society, in general, starts as a monolingual community, meaning they first master their regional languages. However, Indonesian society is constantly faced with language choices when it comes to communication. This phenomenon creates competition between two or more languages, and typically, the smaller languages (mother tongues) often lose out to the dominant languages. Consequently, language shift occurs, leading to the extinction of some languages. UNESCO estimates that half of the 6000 languages existing in the world today are endangered. According to UNESCO's records, out of all these languages, only 300 are considered major languages, while 5700 are considered smaller languages, including 726 smaller languages found in Indonesia. These smaller languages are the ones at risk of extinction [4]. One of the regional languages that is feared to be facing extinction is the Muna language.

The Muna language used to be the language used by the native people of Muna to interact. However, over time, the Muna language began to be rarely used [5]. Language learning in the world of education is also becoming less common and there are almost no more Muna language lessons, because people prefer to use foreign languages that are considered cooler than using their own regional language. As a result, many people in the capital region of Muna Regency do not understand or know the vocabulary of the Muna language itself, and gradually, it will face extinction.

Local languages that are almost extinct are crucial to be preserved. One way of preservation is by leveraging the increasingly advanced technology available today. One of them is by conserving specific regional languages through specialized applications that can aid in searching for vocabulary in the local language as an alternative to large and thick conventional books or dictionaries that can be carried anywhere and accessed at any time. [6]. Nowadays, there are many dictionaries available, ranging from printed books, electronic dictionaries, desktop-based

dictionary applications, web-based dictionaries, and Android-based dictionaries. Electronic dictionaries that used to resemble calculators have now evolved into dictionary applications found on smartphones. The use of dictionary apps on smartphones is more effective, easy to carry anywhere without the need for physical space, as they are readily available on the smartphone itself [7]. In this system development, a software development model called Extreme Programming, commonly abbreviated as XP, is used. Extreme Programming (XP) is one of the agile development methods suitable for rapid system development and can be used to adapt to changing requirements. XP aims to build a system through unclear or rapidly changing requirements with a relatively small team [8]. Metode Extreme Programming (XP) is considered suitable for the development of small to medium-sized applications

Based on the description above, the author intends to create an Android-based Muna language dictionary application using the Extreme Programming method. The dictionary application is developed to preserve and introduce the Muna language to the wider community..

II. THEORETICAL FOUNDATION

A. Dictionary

According to the Kamus Besar Bahasa Indonesia (the Indonesian Dictionary), the definition of "kamus" is a reference book that contains words and expressions usually arranged alphabetically, along with information about their meanings, usage, and translations. A dictionary can also be used as a reference book that explains the meanings of words, serving to assist someone in getting to know new words. Besides explaining word meanings, a dictionary may also provide pronunciation guides, word origins (etymology), and usage examples for certain words. To enhance clarity, illustrations are sometimes included in a dictionary.

B. Muna Language

The most reliable and powerful means of communication in a society is language. Humans use language in their daily lives. Language becomes extremely important in the overall human existence. If the minimal use of language can be understood according to the speaker's intention and purpose, then language has achieved its goal in conveying a message in communication. In formal situations, all conversations must follow certain patterns. In learning the specific intentions and purposes of communication, whether in speech or writing, the main context that speakers need to pay attention to is whether the language's purpose can be achieved or is achieving its goal. [9].

The Muna language is one of the regional languages used by the Muna ethnic group in Muna Regency and its surrounding areas. The Muna language is characterized by vocalic, incorporation, and agglutination features. It is said to have vocalic qualities because data shows that each syllable tends to be open, and its vowels have the freedom to combine with each other within a word. [10]. The Muna language, also

known as Wamba Wuna, is estimated to have been used as a means of communication by the communities in the Muna and Buton Islands since 4000 SM.

C. Extreme Programming Method

Extreme Programing (XP) is one of the agile development methods suitable for rapid system development and can be used to adapt to changing requirements. XP aims to build a system through unclear or rapidly changing requirements with a relatively small team. [8]. In the agile development method, Extreme Programming (XP) is the most popular and widely used model for developing high-quality software. Extreme Programming (XP) focuses on improving software quality and responding to changing requirements. There are five important ways in Extreme Programming (XP) to enhance software projects: communication, simplicity, feedback, respect, and courage [11]. The objective of this method is to form teams on a small to medium scale. This method is also suitable when the team is faced with unclear requirements or rapid changes in requirements [12].
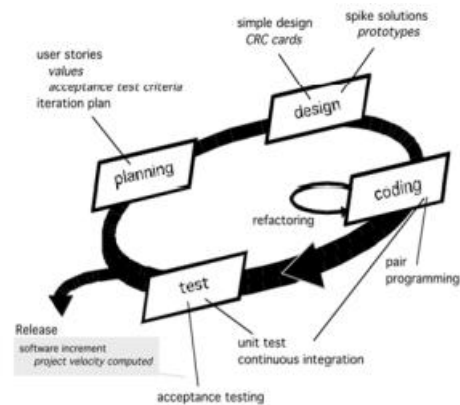

Picture 1. Method of Extreme Programing

There are four stages that need to be carried out in the Extreme Programming (XP) method, namely :

1. Planning: This stage is the initial step in system development, where several planning activities are carried out, including problem identification, analyzing requirements, and setting the schedule for system development implementation.
2. Design: The next stage is the design phase, where modeling activities take place, starting from system modeling, architecture modeling, to database modeling. System and architecture modeling utilize Unified Modeling Language (UML) diagrams, while database modeling uses Entity Relationship Diagram (ERD).
3. Coding: This stage involves the implementation of the previously created models into a user interface using a programming language. The programming language used is Java, with the Android Studio tools for developing the user interface. For the database management system, MySQL software is used.
4. Testing: After the coding stage is completed, the system undergoes testing to identify any errors that may occur while the application is running and to determine if the system built meets user

requirements. The testing method used in this stage is black-box testing, where testing is conducted on various inputs to check if each form functions properly as intended. [13].

III. RESEARCH METHODOLOGY

A. Research stages
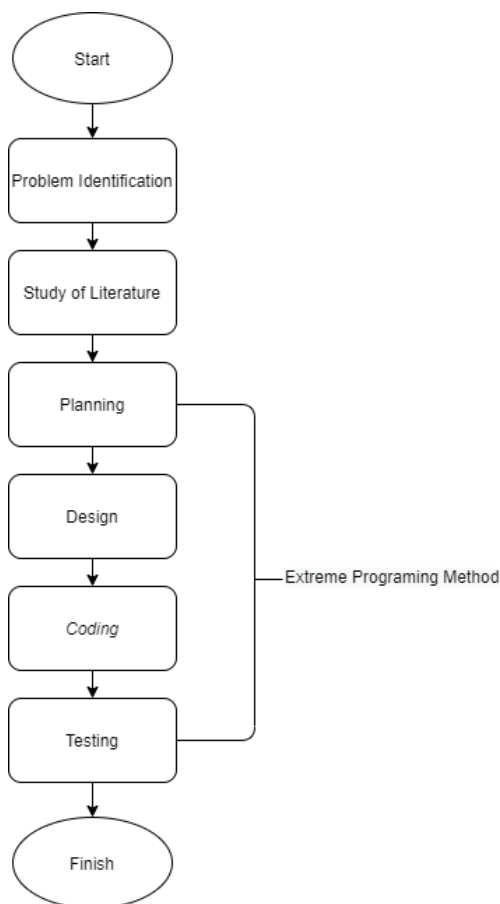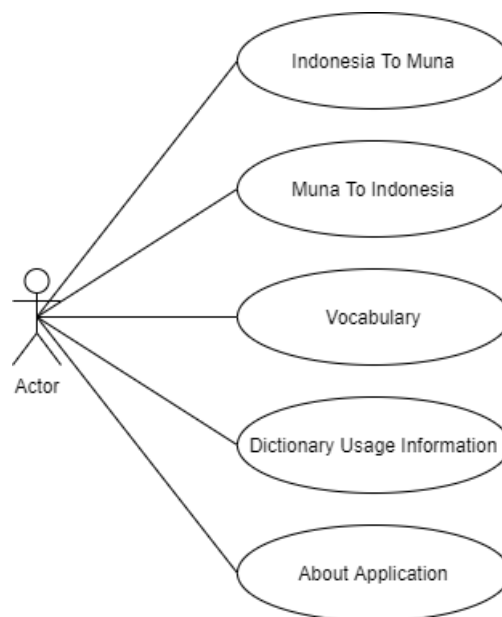

Pictue 2. Use case diagram

1. Problem Identification. This stage involves discussions to gather facts existing in the field. Researchers directly observe the problems present in the field, where there is still a lack of knowledge among the community, especially in the capital area of Muna Regency, about the local language.

2. Literature Review. The literature review is conducted to search for theoretical foundations and serve as references related to the research problem. In this study, the literature review is carried out by searching for journals or theses related to dictionary development. The results of the literature review are used as a reference for developing the application.

3. Planning. This stage is the initial phase of the Extreme Programming (XP) method. In this stage, several planning activities are carried out, including problem identification, analyzing requirements, and setting the schedule for system development implementation.

4. Designing. This stage is the second phase of the Extreme Programming (XP) method. In this stage, modeling activities are carried out, starting from system modeling such as designing use cases, activity diagrams, flowcharts, and class diagrams.

5. Coding. This stage is the third phase of the Extreme Programming (XP) method. It involves the implementation of the previously created models into a user interface using a programming language. The programming language used is Java, with the Android Studio tools for developing the user interface. For the database management system, MySQL software is used.

6. Testing. This stage is the fourth phase of the Extreme Programming (XP) method. It is carried out by testing the existing system in the application using black-box testing.

B. Research Design

1. Use case diagram

Use Case diagram is a graphical representation of some or all actors, use cases, and interactions among these components that introduce a system to be built. It is used to explain the steps that the system should perform. The use cases for this research are as follows

Picture 3. Use case diagram

2. Flowchart

Flowchart is a diagram that displays the steps and decisions involved in executing a process in a program. Below is the flowchart for this application :
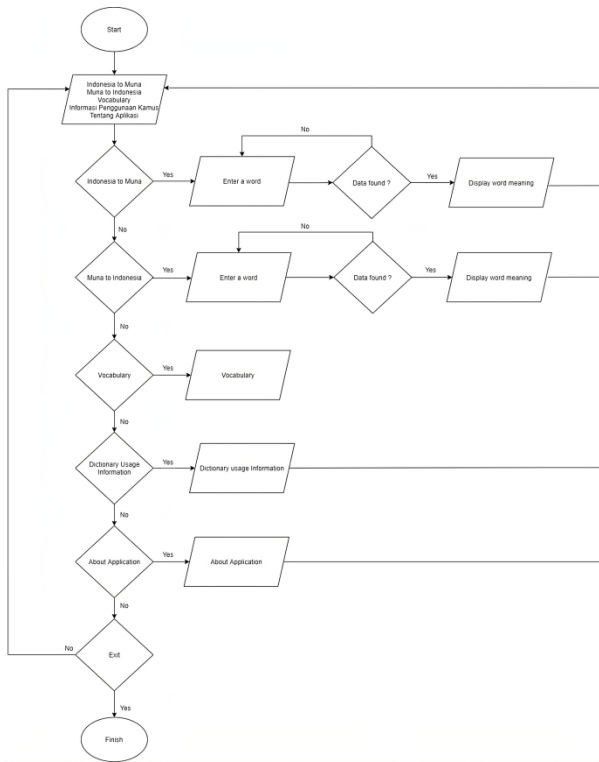
Picture 4. Flowchart Aplikasi

3. Activity diagram

An Activity Diagram depicts various activity flows within the system being designed. The Activity Diagram for this application is as follows :
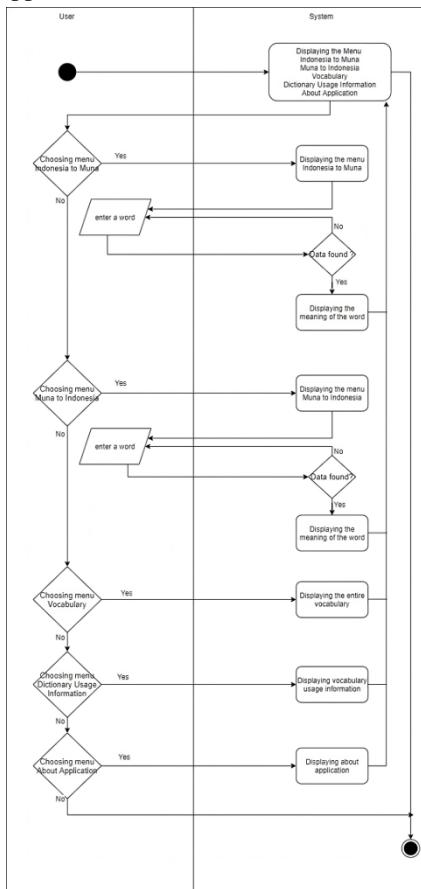
Picture 5. Activity diagram

IV.   RESEARCH FINDINGS AND DISCUSSION

A.   Research result

1. User Interface

Below is the user interface of the Muna language dictionary application.
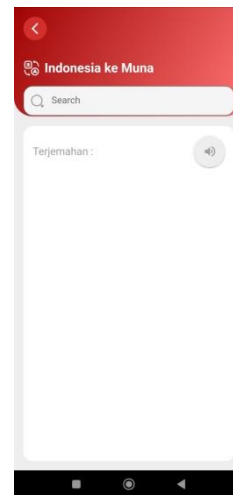
a. Main menu of the application

Picture 6. Main menu of the application

The main menu is a start view when the application is running. On the main menu there are four buttons: button Indonesia ke Muna, button Muna ke Indonesia, button Kosa Kata, button information usage dictionary, and button about the application..
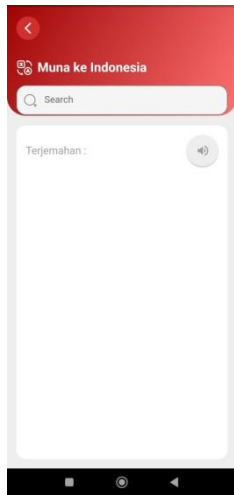
b. The display of Indonesian to Muna menu

Picture 7. The display of Indonesian to Muna menu

On the Indonesian menu to Muna, enables users to search for Muna words by entering words that are in Indonesia. Users can also listen to words through voice features.

c. The display of Muna to Indonesian menu

Picture 8. The display of Muna to Indonesian menu

On the Muna to Indonesia menu, allows users to search for the meaning of the word Muna in Indonesian. Users can also listen to words through voice features.
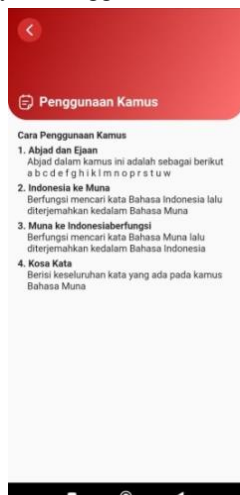
d. The display of the Kosa Kata menu.

Picture 9. The display of Kosa Kata menu

In the Kosa Kata menu, allows users to see the entire vocabulary contained in the dictionary.

e. The display of Penggunaan Kamus menu

In the Penggunaan Kamus menu, users can view the

Picture 10. The display of Penggunaan Kamus menu

information to use dictionary applications.

f. The display of Tentang Aplikasi menu

Picture 11. The display of Tentang Aplikasi menu

In this menu, users can see information about the Muna language dictionary application.

2. Pengujian Sistem

Table 1. Results of trial black box

1	Membuka Aplikasi	Aplikasi terbuka dan menampilkan menu utama	Sesuai
2	Menekan Menu Indonesia ke Muna	Sistem akan menampilkan menu Indonesia ke Muna	Sesuai
3	Input kosakata yang akan di cari pada menu Indonesia ke Muna	Sistem akan menampilkan terjemahan kata yang di cari dalam bahasa Muna	Sesuai
4	Menekan Menu Muna ke Indonesia	Pengguna akan masuk ke menu Muna ke Indonesia	Sesuai
5	Input kosakata yang akan di cari pada menu Muna ke Indonesia	Sistem akan menampilkan terjemahan kata yang di cari dalam bahasa Indonesia	Sesuai
6	Menekan Menu kosa kata	Sistem akan menampilkan keseluruhan kosa kata yang terdapat dalam kamus	Sesuai
7	Menekan Menu Penggunaan Kamus	Sistem akan menampilkan informasi penggunaan kamus	Sesuai
8	Menekan Menu Tentang Aplikasi	Sistem akan menampilkan tentang aplikasi	Sesuai

This test is carried out by testing each feature in the application, whether the action is in line with what is required or not. Based on Table 1, all the features present in this application are running well.

B. Discussion

The local language is a very important cultural asset to preserve. Local language reflects the identity of a group or community [14]. One of the local languages that exists and should be preserved is the local language of Muna. Muna district language is one of the languages spoken by the Muna tribe in the southeastern Sulawesi province, Indonesia. The language of the Muna Region is part of the Austronesia language group. [15]. Preserving the local language helps to preserve the riches and cultural diversity of a region or nation.

However, with the increasing development of technology as well as the introduction of many foreign languages and cultures, the use of Muna languages has begun to be used rarely in the general public, especially in the capital district of Muna, so that Muna's local language is concerned that it will be extinct. Technological developments can also be used to preserve language culture, one of them by creating an Android-based dictionary app that can be accessed through smartphones. The app of Muna regional language dictionary based on android is one of the researchers' efforts to preserve the culture of Muna region. Applications are created using extreme programing.

Muna local language dictionary application is an application made to preserve the culture of Muna regional language. Local language application of Muna, contains about the local language word of Muna. The app allows the search for translation of words from Muna to Indonesian or from Indonesia to Muna in the menu Indonesia for Muna and menu Muna to Indonesia. The app provides 2100 Muna language words that can be viewed through features on the word menu in the dictionary. Inside the app also provides voice features that can enable in listening to the way of speaking from Muna language. The app also provides information about its users as well as about the application that can be viewed in the application usage menu and about the app. In application development, use extreme programming methods that are considered suitable in application creation. Extreme Programming (XP) method is suitable for use in the creation of dictionary applications because dictionary application is a type of application that often requires rapid iteration, active involvement of clients or local language users, and emphasis on the quality and accuracy of the data provided. The phase of the extreme programming method is used in building this application. At the initial stage, the researchers identified the features needed by users in this case in the public community that exists in the capital district of Muna. Design is then done by creating system modelling such as use case, flowchart, activity diagram, class diagram as well as interface planning. Then code (encoding) after it is tested to test the application that has been created using the black box testing method.

The app is based on Android. This makes it easier for users to access the application. Android-based apps are software or programs designed and developed to run on Android operating systems, which are the most popular operating system for mobile devices, such as smartphones and tablets [16]. The application of the dictionary is expected to improve and preserve the language culture of the Muna region among the general public in the area of the capital of Muna district.

V. CLOSING

A. Conclusion

Based on the explanations and descriptions presented earlier, the following conclusions can be drawn:

1. One of the ways to preserve the cultural heritage of the Muna language in Muna Regency is by designing a dictionary application that can be easily accessed and used by the community, utilizing technology such as smartphones. This dictionary application is expected to facilitate users in searching for and understanding words in the Muna language.

2. The design of the Muna language dictionary application based on Android was carried out by applying the Extreme Programming (XP) method, which is considered suitable for application development. Extreme Programming (XP) can improve the quality, flexibility, and efficiency of application development. The stages in Extreme Programming were used to create the local language dictionary application. The stages began with planning, designing, coding, and testing. Planning was done by identifying the features needed by users. Designing involved creating system modeling such as flowcharts, use cases, class diagrams, and activity diagrams. Coding was done using the Java programming language with Android Studio tools. Testing was conducted using black box testing, where the test results showed that all the features in the application were as expected and functioned well.

B. Recommendations

The researcher's suggestions are as follows:

1. To preserve cultural heritage, explore new ways by harnessing rapidly advancing technologies.

2. The design of the Muna language dictionary application based on Android is still far from perfect and has many shortcomings. The application is relatively simple, so there is a need for further development to make it more appealing.

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