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Application Design of Magic Words to Learn Reading for the First Grade Students at Elementary School using Kodular Website

Salsabila Nurhaliza Putri Isnani[1], Fitria Rahmawati[2], Cahyo Hasanudin[3*], Ayu Fitrianingsih[4], Oktha Ika Rahmawati[5], Evi Chamalah[6]
[1,2,3*]Indonesian Language and Literature Education, IKIP PGRI Bojonegoro, Indonesia
[4,5]English Education, IKIP PGRI Bojonegoro, Indonesia
[6]Indonesian Language and Literature Education, Universitas Islam Sultan Agung, Indonesia

[1]salsabilanurhaliza2004@gmail.com; [2]rahmawativ308@gmail.com;
[3*]cahyo.hasanudin@ikippgribojonegoro.ac.id; [4]ayu_fitrianingsih@ikippgribojonegoro.ac.id;
[5]oktha_ika@ikippgribojonegoro.ac.id; [6]chamalah@unissula.ac.id

***Corresponding Author**

Keywords

Learning to read, elementary school, Kodular Website

Abstract

Kodular is a web-based platform that provides a variety of features for creating Android applications. Its function is very similar to MIT App Inventor, with the main purpose of making Android application development easier. The purpose of this research is to develop an online learning application that can be accessed through Android-based smartphone. This application is designed using the Kodular platform and developed through the SDLC method of the Waterfall model, which includes the stages of need, design, implementation, verification, and maintenance. The results of the discussion of this research are the components that make up the screen display of the magic words application: learning to read which includes: 1) start page display, 2) introduction menu page display, 3) main menu page display, 4) introduction menu display, 5) quiz menu display, 6) menu display about the application. The conclusion of this research is that there are 5 stages in making the magic words application: learning to read using a codular website.

Introduction

Learning activities have various perspectives, depending on the context and goals to be achieved, as explained by several experts. According to Hamalik in Parnawi (2019), learning refers to kinds of activities carried out related to learning conditions, such as activities during lessons, taking exams, and others. Meanwhile, Pidarta in Sutianah (2022) states that learning is a process that changes behaviour relatively permanent as a result of experience, enabling individual to apply the knowledge in other contexts and delivering it to others. Learning is defined in a broad sense as a psycho-physical activity aimed at achieving overall personal balance. More narrowly, learning can be interpreted as an effort to master scientific material, as apart of the process of forming a complete personality (Sadirman in Sariani, et al., 2021)

Learning also has the goals, for instance, learning aims to change a person's behaviour through the learning process (Istiadah, 2021). According to Slameto in Harefa (2023) the goals of learning is an effort to achieve overall changes behaviour as the result of personal experiences through interaction with the environment. The learning goal is to self-development; learning can focus on individual development, such as increasing self confidence, overcoming anxiety, and developing social skills (Hidayat, 2024).

Learning has some characteristics. According to Parwatid et al., (2023) the main characteristic of learning is the changes of behaviour from not being able to do an activity to being able to do it. Meanwhile, Siregar and Nara (2015) state that one of the signs that someone has acquired new knowledge or skills are a visible change in their attitude or behaviour. According to Gagne in Maâ (2018), the three characteristics of learning are process, experience and behaviour.

Learning and reading have a close relationship because reading is one of the main activities in the learning process. According to Soedarso in Darmadi (2016), reading is a complex activity that involves various separate actions and those activities include understanding and imagination, observation, and the process of remembering. Meanwhile, Riyanti (2021) defines reading as an activity that carried out by readers to understand the message conveyed by the author through writing or a series of words. In a broader sense, reading is a critical and creative process to understand the content of reading text deeply, followed by an evaluation of its condition, value, function and impact (Nurhadi, 2022)

Reading has several purposes. According to Sutan in Suryana (2016), reading has the following purposes: 1) reading for pleasure is done in a relaxed atmosphere, such as reading novels, short stories, comics or magazines, 2) reading for obtaining or understanding certain information and knowledge. Bastin (2022) mentioned that there are three objectives in reading, (1) to obtain and master the information, (2) to master and analyze the information obtained in order to develop understanding, and (3) to obtain knowledge and skills from learning outcomes formulated by experts in the field. The other objectives of reading are to seek information in three aspects: a) cognitive and intellectual, which is used to increase someone's scientific knowledge; b) referential and factual, which is used to reveal facts found

in this world; and c) active and emotional, that is used to seek satisfaction or enjoyment in reading (Sa'ud, et al., 2021)

Reading has several types, including scanning, silent reading and reading aloud. Reading aloud is an activity used by teachers, students or readers to convey the author's information, ideas and feelings to the listeners (Taringan in Dalman, 2014). Silent reading is a reading activity carried out without involving the sound (Suparlan, 2021). Scanning is an activity of reading quickly to get a general picture or to look for certain information in the text (Santoso in Patiung, 2016)

Reading has an important role in the education of elementary school students, especially for the 1st grade. At this stage, students are in the initial phase of introducing and mastering basic literacy skills. Elementary schools are basic educational institutions that organize educational programs for six years, consisting of general elementary schools and inclusive elementary schools (Bastian, et al., 2007). Elementary schools are educational institutions that organize basic education programs for six years, which intended for children aged 7 to 12 years (Kurniawan, 2015)

The elementary school period takes place between the ages of 6 to 12 years. It is also known as the school period, the ideal period for studying or undergoing education (Kurniawan, 2015). According to Sugianto (2010), elementary school children experience significant changes, both mentally and physically. School-aged children experience a developmental stage where they become more skilled in social skills, absorb cultural and moral values from the family, and try to adapt to their peer group (Yuliarsih et al., 2024)

Kodular Application has a close relationship with elementary schools, especially in supporting more interactive and innovative learning process. According to Ekawati and Basri (2022), Kodular is a website for developing applications as learning media. Kodular is an online platform that allows users to create Android applications without having to write program code manually (Kartika, Husnidar, & Hayati, 2023). Kodular Application is a web platform that provides various accessible features and is similar to MIT App Inventor, with the aim of creating Android applications (Djuredje, and Himawan, 2022)

Kodular application aims to become a platform that functions as a means for designing online learning applications based on Android (Aldadkk., 2024). Prianbogo and Rafida, (2022) stated that the aim of Kodular application is not only to create Android-based applications, but also to support the uploading of applications to Kodular Store as well as the creation of special add-ons to create widgets that are not available by default. Meanwhile, Prayogod et al., (2020) mentioned that the aim of Kodular application is to create Android applications easily through practical online software, without requiring a deep understanding of programming codes, but still applying algorithmic concepts similar to it.

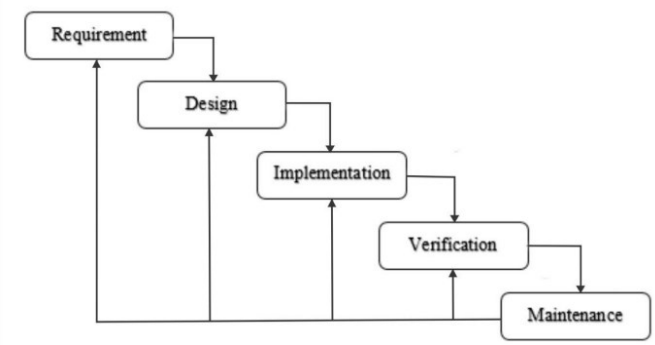
Kodular application has advantages over its features compared to other application platforms,which is more diverse and complex. It also allows effective and more efficient

Android applications creation. Besides, it provides various features for advertising media that can be used as an income (Purwanti, 2015). In the opinion of Herlianus and Gunadi, (2022) one of the benefits of Kodular is the ability to directly test or run applications that have been created without the need to export them first. Moreover, Hanum and Sari, (2023) stated that the benefit of Kodular for teachers is providing the opportunity to create an innovative and creative learning environment, as well as improving students' scientific literacy skills. Therefore, this research is important to be carried out because "magic words: learn to read" application can help the 1st grade elementary school students to improve their reading skills through interactive learning media that is easy to use and fun by using the Kodular website.

Method

Research design

This research method uses SDLC waterfall model. According to Hartono, (2020) System Development Life Cycle (SDLC) is a series of processes in systems and software engineering consists of designing, developing, and modifying systems. It also includes models and methods used in their development. The Waterfall method is used in software development by applying a model that follows the software workflow in a structured and sequential manner (Dharmawand et al., 2018). This method is called waterfall because each stage must be completed sequentially, starting from the requirements stage, before continuing to the next stage (Wijaya and Astuti, 2019). In general, the steps in the waterfall model can be seen in the following picture.



Picture 1. SDLC Waterfall Method (Pressman, 2012)

1. **Requirement**

   In this stage, the system developers need to communicate to understand user needs regarding the software and the limitations. Information can be obtained through interviews, discussions, or direct surveys, and then analyzed to obtain relevant data to the needs. According to Palit et al., (2015) this process focuses attentively on looking for the needs of software.

2. **Design**

   Software design is a gradual process that focuses on developing software programs, including data structure design, architecture software, interfaces, and coding procedures (Nur, 2019). At this stage, the developer designs the system to identify the requirements for the hardware and system, and determines the overall of architecture system.

3. **Implementation**

   In this phase, the system is initially developed in small programs called units, which will then be combined at the next stage. Each unit is designed and tested to ensure its functionality; this process is known as unit testing. According to Fadjeri and Hidayat, (2024), at this stage, a computer program is produced. It is developed based on the design at the previous phase.

4. **Verification**

   In this stage, the system is verified and tested to ensure whether the system has met the specified requirements or not. Testing is divided into several categories, namely unit testing carried out on certain modules of the code, system testing to assess system reactions when all modules are integrated, and acceptance testing to ensure that all customer' needs have been achieved. Driyani (2018) stated that this step is the final step in system development, namely the verification process by the user. At this phase, the user will test the application to ensure its suitability to the specified needs.

5. **Maintenance**

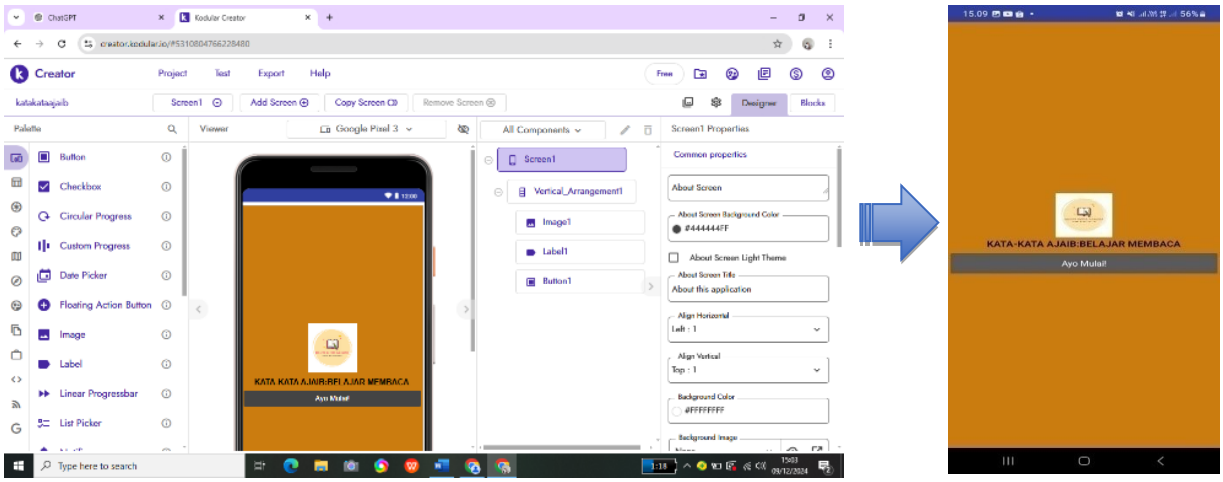
   Mainatenance is the final step in the waterfall method. Developed Software is started to be implemented, accompanied by a maintenance process. Maintenance includes repairs to errors that may not have been detected at previous stages (Rahman, 2021)

Results and Discussion

This research aims to develop an online learning application that can be accessed by Android-based smartphone. This application was designed using Kodular platform as the main media in the creation process. The result of this research is the creation of an Android-based online learning application for the 1st grade elementary school students in Bahasa Indonesia school subject.

The application display shows a design that suitable for online learning needs of the 1st grade elementary school students, especially in Bahasa Indonesia subject. Several components of the preparation are explained as follows:

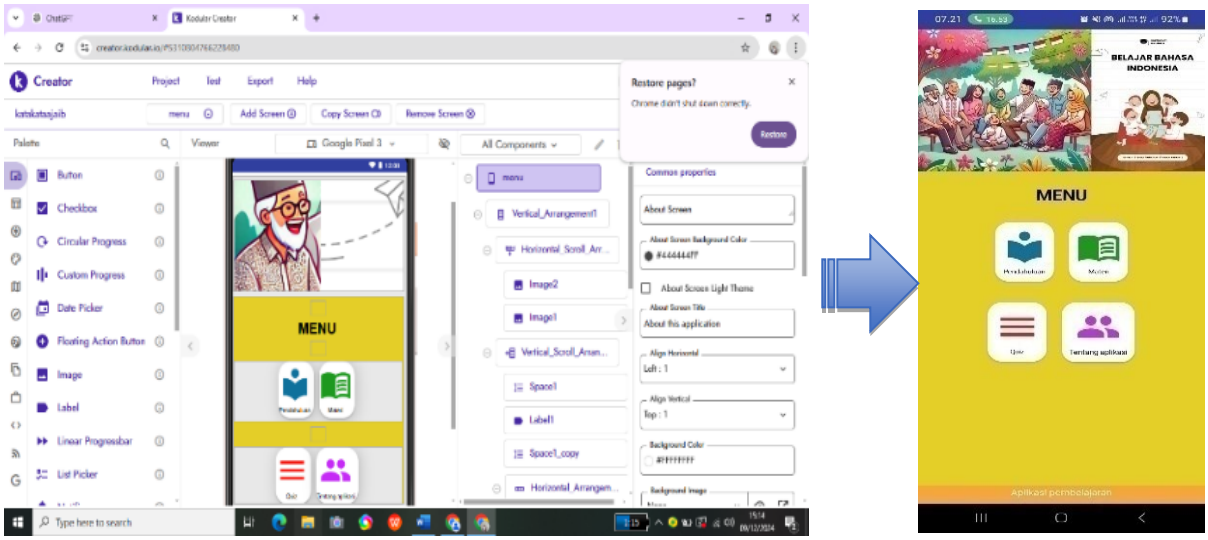
Home page Display



Picture 1. The components of home page screen

On the homepage, there are several main components designed to provide a simple yet functional look. **Screen 1** is used as the main screen, with a dark coloured background (#444444FF) to create an interesting contrast. Inside, there is a **Vertical Arrangement** functioning as a container for arranging elements vertically. The first component is **Image**, which displays the application logo in the center of the screen, followed by a **Label** containing the text "**MAGIC WORDS: LEARN TO READ**" as the application title. At the bottom of the screen, there is a **Button** "**Ayo Mulai!**" as navigation to the menu page. This button is arranged using block logic. When it is clicked, a new screen called "**menu**" will be opened. The design made the homepage looks attractive, informative, and easy to use by users.

Main Menu Page View

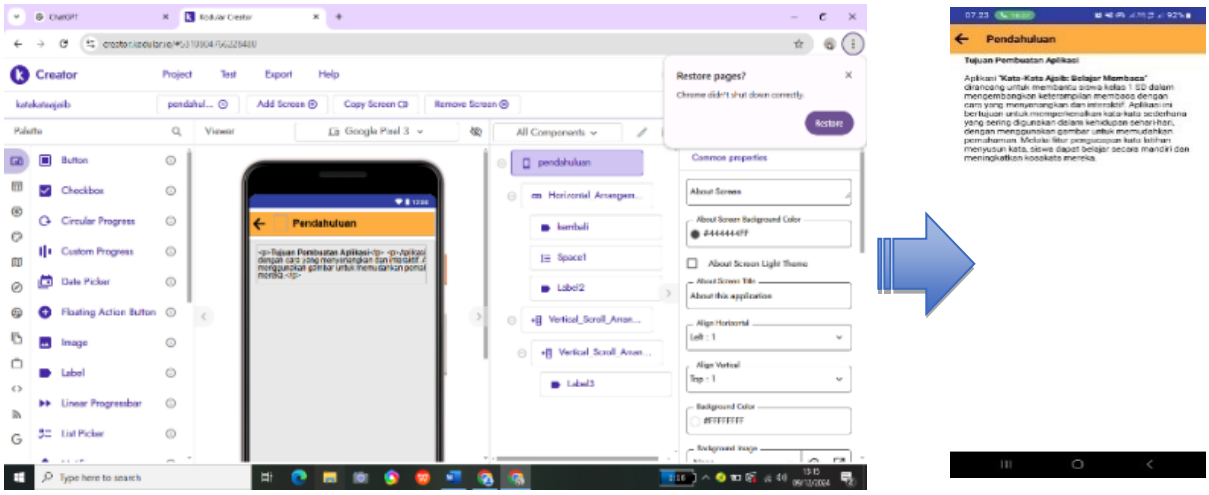


Picture 2. Components of the main menu screen

The main page display on this app is the app home screen with the MENU title. It has four main menu options that consists of Introduction, Material, Quiz, and About the Application. Each menu is equipped with the appropriate icons and text. The menu layout is arranged using the **Horizontal Arrangement** component to place two menus in one row, while **Vertical Arrangement** is used to arrange the menu vertically so that the display is neater and more structured. The title words "MENU" uses a label with a yellow background colour to make it more prominent, while the list menus below use the image component as a representative navigation icon. Each icon or menu area is made clickable so that users can navigate to other screens according to the selected menu. In addition, screen properties such as **Align Horizontal** and **Align Vertical** are used to adjust the position of the components so that they are even and proportional.

The background of the screen is white (**#FFFFFF**) to maintain a simple yet clean impression, while the combination of yellow on the title and contrasting icons makes the display more attractive and understandable. With these components, the main menu becomes more interactive, aesthetic, and makes it easier for users to explore the application.

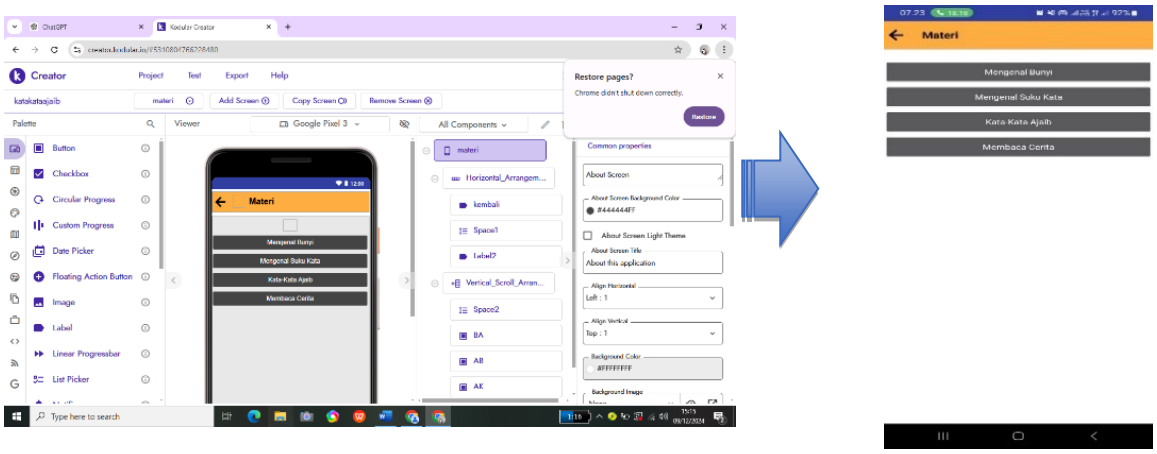
Introductory menu display



Picture 3. The components of introductory screen

The "Introduction" screen was created using several main components. The **Horizontal Arrangement** component is used to arrange the layout horizontally, where there is a **Button** as back navigation and a **Label** that displays "Introduction" as the title. To display the learning objective text, **Vertical Scroll Arrangement** is used to allow the text to be scrolled if it exceeds the height of the screen. This text is displayed by using **label** in HTML format to make it look neater and more structured. The combination of these components is designed to provide a simple, informative, and easy to use.

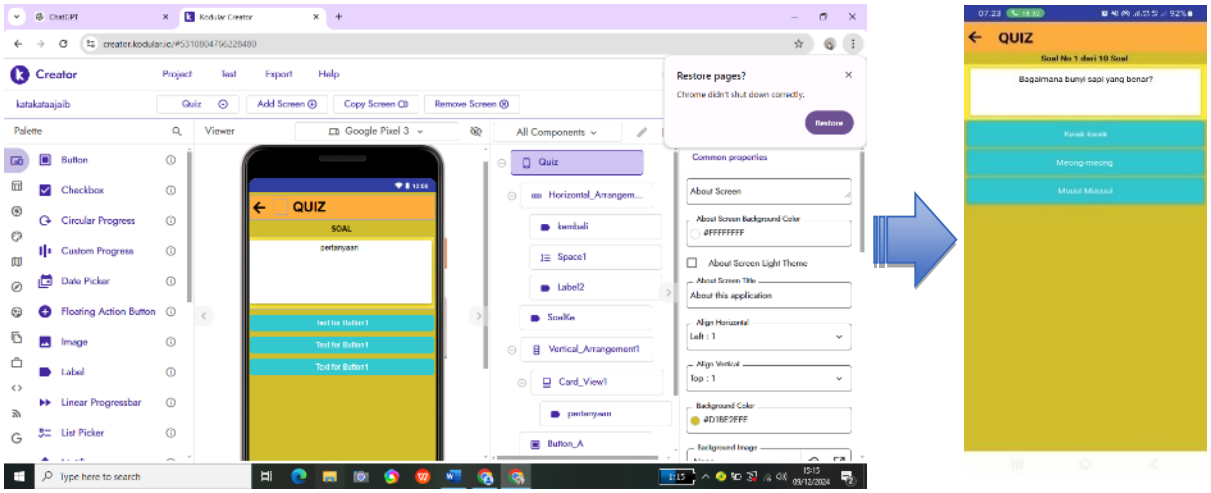
Material Menu Display



Picture 4. The components of material screen

The "Material" screen is designed using several main components. Horizontal Arrangement is used at the top. Button is used as back navigation and Label containing the title "Material". To display the list of lesson chapters, Vertical Scroll Arrangement is used so that all material options can be accessed even though the number exceeds the height of the screen. Each lesson chapter such as "Recognizing Sounds," "Recognizing Syllables," "Magic Words," and "Reading Stories" is displayed in Button, so that users can select the wanted chapter. The source of this material comes from the Bahasa Indonesia in Merdeka Curriculum Book for the 1st grade of Elementary School. The materials then are saved in Google Drive, allowing the material to be accessed easily and practically by students.

Quiz Menu Display

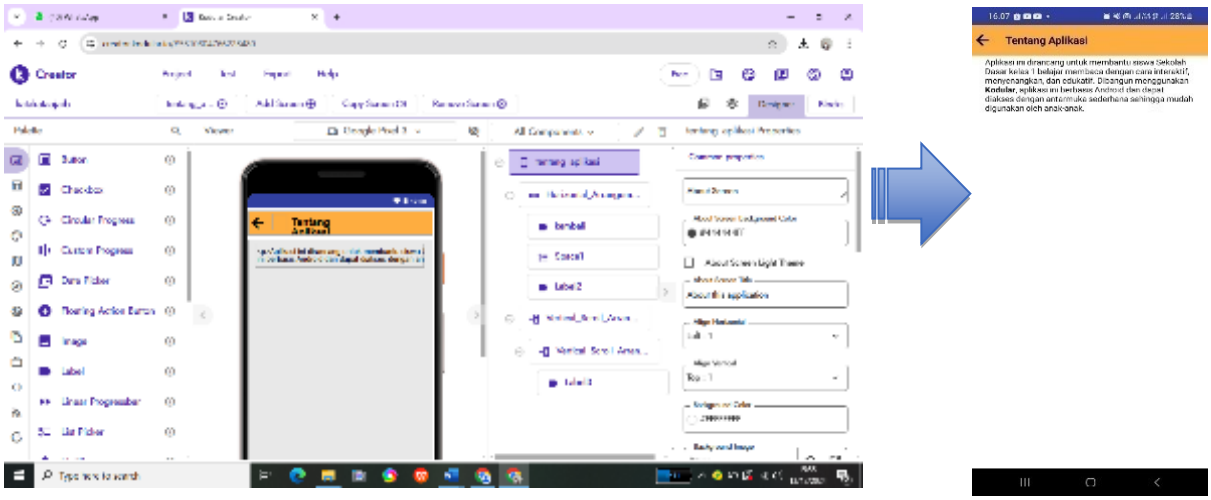


Picture 5. The Components of Quiz Screen

The Quiz menu display in Kodular Creator is designed using various components to create a neat and functional layout. The **Horizontal_Arrangement** component is used to arrange elements such as "back" button and the quiz title horizontally at the top of the screen So that it appears more organized. **Label** plays an important role in displaying text, such as the title "Quiz" on Label 2, the question number on label “Soal Ke”, and the question displayed on Label “Question”. To keep the distance between components from being too tight, Space 1 is used as a separator.

The Card_View component gives a “card-like” display effect to the question area, making it more attractive and professional. Meanwhile, Button is used as an answer selection button in the quiz, allowing direct interaction with the user. In addition, properties such as Background Color (#D1BE2EFE) are used to provide a background color on the screen to make it more attractive. Meanwhile, the Align Horizontal and Align Vertical properties ensure that the position of the components neatly and orderly. With the combination of these components, the quiz menu looks neater, more professional, and more user-friendly, providing a better user experience.

About application menu display



Picutre 6. The components of about application screen

Kodular application in picture 6 consists of several components that affect the appearance of the screen. The **Horizontal Arrangement** component is used to arrange elements horizontally, such as "back" button and "About App" title, so that they are well-organized in one row. The "back" Button icon makes it easier for users to navigate to the previous screen. The Space component provides space between elements, making the display more aesthetic and comfortable. Label is used to display text, such as the application title and description, which provide information to the user. In addition, the Vertical Scroll Arrangement allows the screen to be scrolled vertically, so that long content remains

accessible. Properties such as Background Colour are also applied to set the background color, creating a more attractive and consistent view. Overall, these components provide an organized, functional, and easy-to-use interface.

Conclusion

The application design of "Magic words: learn to read" for the 1st grade Elementary School using Kodular Website has several stages in creating the screen display, including: 1) home page display, 2) main menu page display, 3) introductory menu display, 4) material menu page display, 5) quiz menu display, and 6) about the application menu display.

Authorship Contribution Statement

Isnani: conceptualization and developing the research design. Rahmawati: managing the entire research process. Hasanudin: Field research including data collection. Fitrianingsih: Writing the literature review. Rahmawati: organizing the discussion and conclusion, and supervising the research. Chamalah: Data analysis, data presentation, results composition, and final editing.

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