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Implementation of UAT and Blackbox Methods in the Android-Based Prayer Collection and News Portal Application of PP El-Bayan

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Abstract:

PP El-Bayan is a pesantren located in Cilacap. One of the books taught at this pesantren is Aurod, which contains a collection of prayers, poems, and guidelines for worship. Despite being in the digital age, PP El-Bayan does not yet have an application that includes Aurod and a pesantren news portal, so students are still required to bring the physical Aurod book in order to practice the prayers. This situation also indicates that the pesantren does not yet have a dedicated digital platform to share Islamic news and articles. This study employs the prototype method, which consists of six steps: first, gathering requirements and analyzing the existing system; second, quickly designing a model; third, creating a prototype; fourth, presenting the prototype; fifth, making revisions to the prototype if necessary based on feedback during the presentation and finally. The goal of this research is to develop an application that presents the prayers taught at PP El-Bayan and provides access to the latest news and Islamic articles related to the pesantren. This study resulted in the Bayanian application, an Android application containing a collection of prayers and news from Islamic boarding schools along with various additional features, which are expected to provide greater benefits to its users. The hypothesis of testing this material was accepted from the application with a user acceptance test, namely Good. with a result of 87.7%, so that the system is categorized as very strong according to Riduwan (2008), if the percentage results obtained reach 81% -100% then the test results can be said to be very strong so that the system that has been created can be implemented.

INTRODUCTION

PP El-Bayan is an Islamic boarding school located in Majenang District, Cilacap Regency. According to census data from Jumadil Awal 1444, the number of students registered at this boarding school reached 1,305 in December 2022. With such a large student population, PP El-Bayan is increasingly committed to providing comprehensive education, both physically and spiritually, while maintaining the unique traditions of the pesantren. One of the traditions that continues to be upheld is the use of *Aurod*, a book containing a collection of supplications (wirid) taught by the founders and scholars of PP El-Bayan, which must be practiced by the students. Every student is required to own and carry the *Aurod* wherever they go.

While continuing to preserve this tradition, PP El-Bayan also keeps up with developments in science and technology (IPTEK). The pesantren is equipped with computer laboratory facilities, and some students continue their studies at universities, choosing Information Technology as their field of study, to align their faith and piety (imtaq) with the rapid advancement of technology.

With the rapid advancement of technology, especially in the field of smartphones, access to information has become increasingly easier. According to data from Goodstats.id, in 2023, there were 7.33 billion people using mobile phones [1]. Most people, including the students and alumni of PP El-Bayan, now own mobile phones. Various applications are available to make users' lives easier, including those that simplify access to information. In this context, the presence of an Android application containing a collection of *Aurod* supplications will be highly beneficial for both the students and alumni of PP El-Bayan. For active students, this application allows them to access the *Aurod* supplications without the need to carry the physical book. Meanwhile, for alumni, the application provides easy access to *Aurod* anytime and anywhere. With this application, it is hoped that it will enhance convenience, efficiency, and effectiveness, particularly in finding the prayers needed, as explained in the research by Maiyana [2].

In addition, the development of smartphone technology has accelerated the distribution of news. Various news portal applications have emerged, offering information in an engaging way and tailored to the interests of readers, as explained by Afrinaldi et al [3]. However, this progress also needs to be cautious, as not all information circulating can be verified for its accuracy. News can be either factual or fictional, and it may be considered true if it aligns with reality, but conversely, it can be deemed false if it does not reflect the actual events [4].

False information or hoaxes can be dangerous, especially with the rapid spread of information in the current digital era. Therefore, it is necessary to be careful in receiving news and always verify its truth before believing it. One solution to overcome this is to develop a news portal application that can verify and present accurate information [5].

Based on these problems, this study aims to test the PP El-Bayan Android-Based News Portal and Prayer Collection Application by implementing the UAT and Blackbox Testing methods. This is very important to ensure the quality, functionality, and reliability of the application [6]. The application of these two methods not only plays an important role in ensuring that the application meets user expectations, but also provides solutions to potential problems related to functionality, technical aspects, and security. Thus, this application is expected to provide optimal benefits for students, alumni, and the wider community, in accordance with its purpose to facilitate access to prayers and news in the rapidly developing digital era [7].

METHOD

In this study, the researcher employed the prototype system development model. This method involves presenting the initial version of the application to users, with the expectation that the final outcome will better meet the users' needs and preferences. According to Nurul [8]. This method involves six main steps, namely:

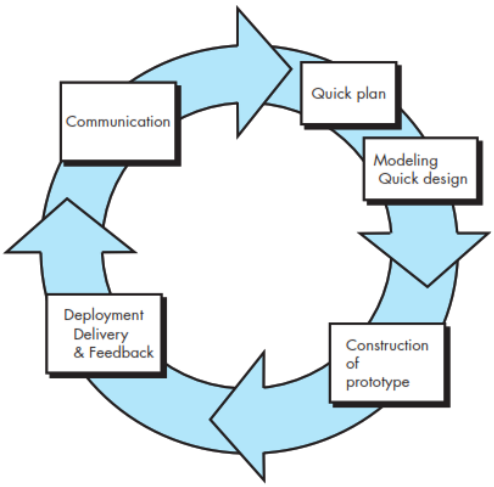

Figure 1. Prototype Method [9]

1. Collection of Requirements and System Analysis
   In this stage, the researcher conducts interviews with the secretarial department, the education department, the daily leader of the pesantren, and alumni as an initial step to determine the application to be developed.
2. Rapid Design Modeling
   At this stage, the researcher creates a design that will serve as the foundation for developing the prototype model.
3. Prototype Development
   In this process, the researcher will create a prototype based on the initial sketches developed in the previous step [10].
4. Prototype Evaluation
   After the prototype is created, it will be presented to the head of the pesantren for review and corrections, if there are any aspects that need improvement or refinement [11].
5. Prototype Revision
   This stage is carried out if there are corrections from the previous stage, requiring changes to the prototype that has been created. Once the prototype is approved, it is then used to build the system [12].
6. Use of Prototype
   The system is built using the prototype that has been evaluated in the previous stage.

UAT (User Acceptance Testing) is intended to ensure that the developed application meets the users' needs and functions properly within the desired context. This testing is typically conducted by the end users, who are the individuals that will be using the application in their daily activities (in this case, the students and administrators of the pesantren) [13]. Stages of UAT:

1. UAT preparation:
   a. User Identification
   b. Define Success Criteria
   c. Create a UAT Plan
2. Implementation of UAT [9]:
   a. Functionality Testing
   b. User Experience (UX) Testing
   c. Accessibility Testing
3. Feedback Collection:

   a. During and after testing, testers provide feedback on what went well and what needs improvement.
   b. Typically, a feedback form or short interview is conducted to collect user opinions about the interface and functionality of the application.
4. Revision Based on Feedback:
   a. If problems or areas needing improvement are discovered during UAT, the application is revised and improved [14].
   b. These improvements may include design changes, feature fixes, or user experience enhancements.
5. Evaluation of UAT Success:
   a. After the fix is implemented, retesting is performed to ensure the issues discovered during UAT have been fixed.
   b. If the application successfully meets the predetermined criteria, then the UAT stage is considered successful [15].

Black box testing focuses on testing application functionality without paying attention to the source code or internal structure of the application [16]. This testing checks whether the application functions according to specifications and can meet user requirements from the end user's perspective. Blackbox Testing Stages: 1. Preparation for Blackbox Testing [17]; 2. Implementation of Blackbox Testing; 3) Security Testing; 4) Boundary Testing; 5) Appearance and User Interface (UI) Testing.

RESULTS AND DISCUSSION

Results

A. Preliminary Manufacturing

Researchers make initial designs or sketches that will be used as prototypes.

1. Use Case

Diagrams are used to illustrate the way of interaction between the system and external parties (called actors) who interact with the system.

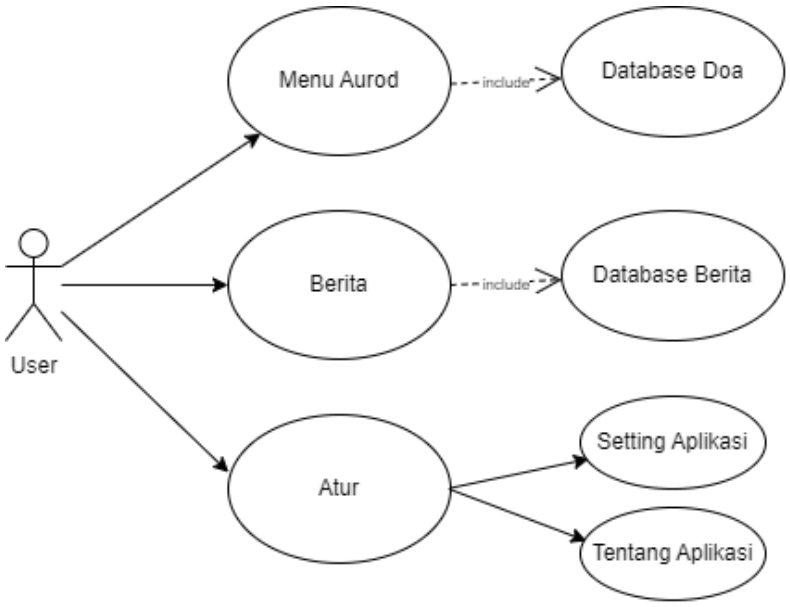

Figure 2. Use Case Diagram Application from User

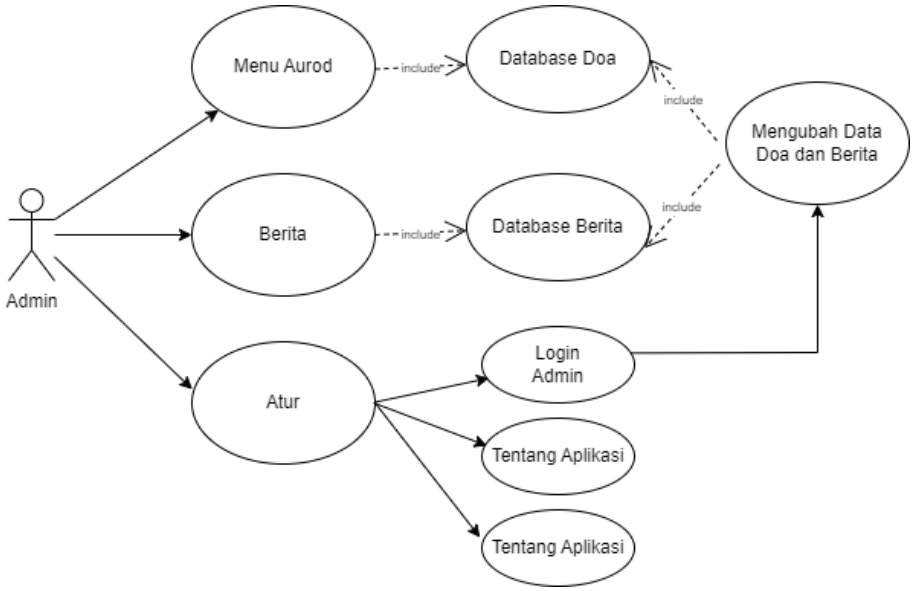

Figure 3. Use Case Application Diagram from Admin

There are two actors involved in application interaction, namely:

a) User: this actor is an application user who has access to read prayers and articles as well as customize the application according to the features provided to him.
b) Admin: the same as the user actor and also this actor can create, delete and edit prayers and news that will be presented in the application.

2. Activity Diagram

UML is used to depict activities and workflows within a system. The activity diagrams created for the prayer collection and news portal application include several diagrams, such as the activity diagram for opening Aurod, opening the article menu, opening the settings menu, and creating new news/articles.

The activity diagram for opening Aurod illustrates the process when the user opens the application and selects the Aurod menu, which displays the prayers found in the Aurod book.

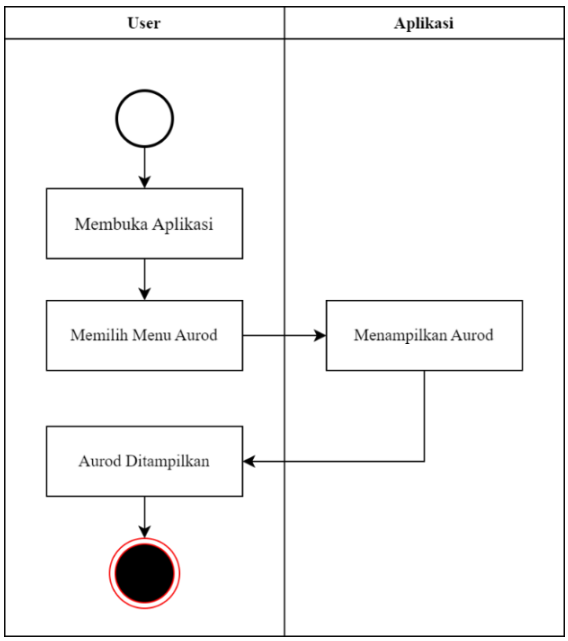

Figure 4. Activity Diagram for Opening Aurat

B. Prototype Making

At the prototype formation stage, the interface design that has been created using Figma is implemented into an appropriate appearance. Implementation of the interface design into an Android application was carried out using the Dart programming language and Flutter worksheets.

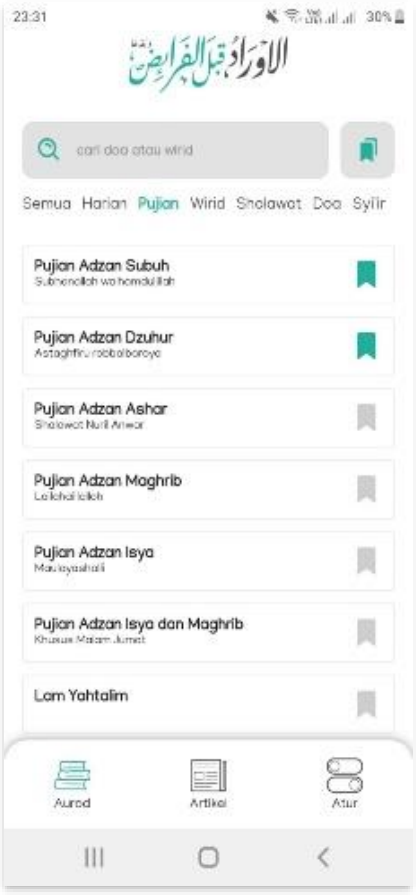

Figure 5. Wirid menu

Figure 6. Prayer Details

Figures 5 and 6 show the implementation of the aurod menu and prayer details created using flutter. Figure 5 also shows that the prayer filtering implementation has been adjusted to prayer categories which will make it easier for users to group prayers.

The Article menu and details are in Figure 7 and Figure 8. The articles that will appear are data that has been entered into the database. Users can also filter articles based on categories created by the admin. The article menu also has a bookmark function to make it easier for users to save articles.

Figure 7. Article menu

Figure 8. Article details

C. Use of Prototypes

The prototype used is a prototype that has previously been designed, modeled, presented and revised based on needs until it becomes a final prototype that is ready to be implemented into an application. The prototype implementation becomes the final application combining components and lines of programming code. These components include:

1. Firebase Firestore Database Implementation

The database used as a data bank in the application created is Firestore. Field collections in Firestore are tailored to application needs.

Table 1. Field Database Implementation

Application Requirements	Type	Implementasi Database
Title	String	title
Categoryi	String	category
Writer	String	upload_by
Time	Date	date
Image Link	String	image
Image Description	String	image_desc
Article Contents	String	description
Ibarat	String	ibarat

Database implementation also means setting up Firestore so that it can be accessed by applications. The setup carried out includes setting the Firestore role with the following settings:

Table 2. Firestore Role Settings

```
rules_version = '2';
service cloud.firestore {
  match /databases/{database}/documents {
    match /{document=**} {
      allow read, write;
    }
  }
}
```

Table 2 shows the code used to make Firebase data accessible to applications and article upload pages.

2. Article Upload Web Implementation

The implementation of the link that will be used as a medium for uploading articles by the Islamic boarding school admin is made using the Bootsrap frameworok.

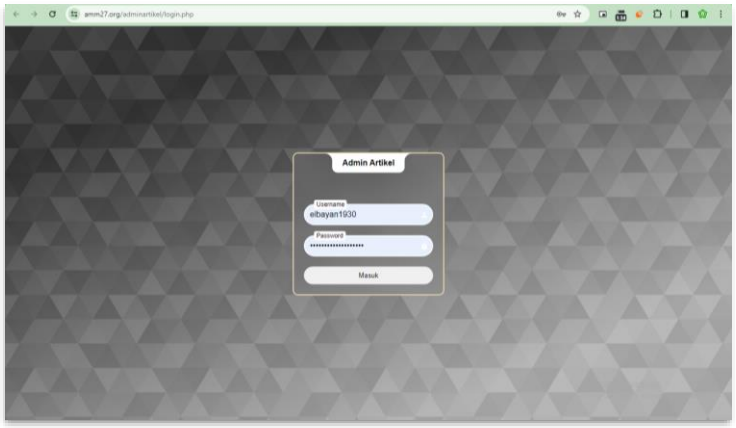

Figure 9. Ungga Link Login

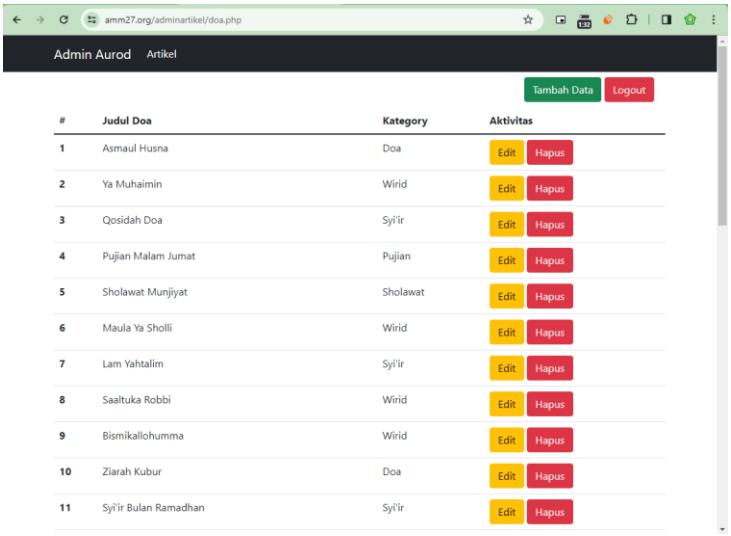

Figure 10. Implementation of Upload Link for Prayers and Articles

Figure 10 displays the page link used by the admin to upload articles. This link facilitates the admin in creating a new document collection. The upload link is created using HTML with several lines of JavaScript code.

3. Implementation of Prototype Usage

The use of the final prototype as the foundation for building the application was carried out using Flutter's workspace. Below is the application that was successfully created by combining the previous components:

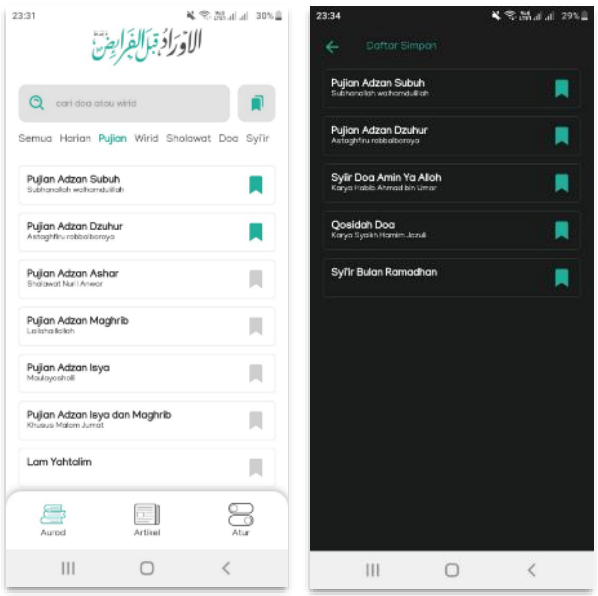

Figure 11. Implementation of Aurod Menu

Figure 11 shows the creation of the Aurod menu, which contains prayers, exactly as outlined in the prototype. Features such as the filtering button, search column, and bookmark button have been implemented to enhance user convenience. The dark mode feature has also been successfully created to provide a more comfortable experience for users who prefer it.

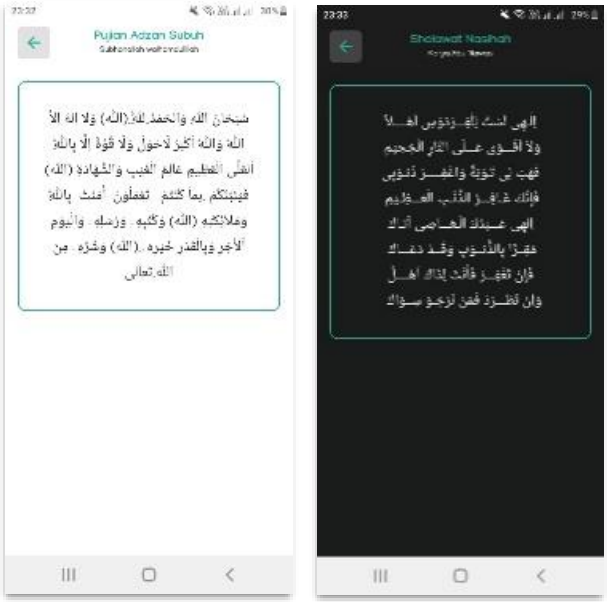

Figure 12. Implementation of Aurod Details

Figure 12 shows the Aurod details that have been created in both light and dark modes.

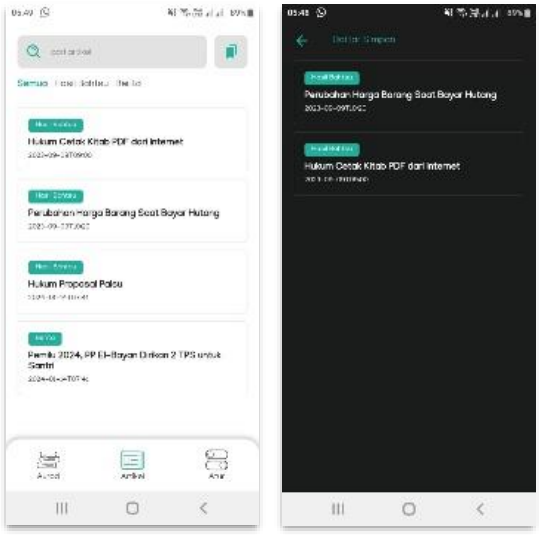

Figure 13. Implementation of the Article Menu.

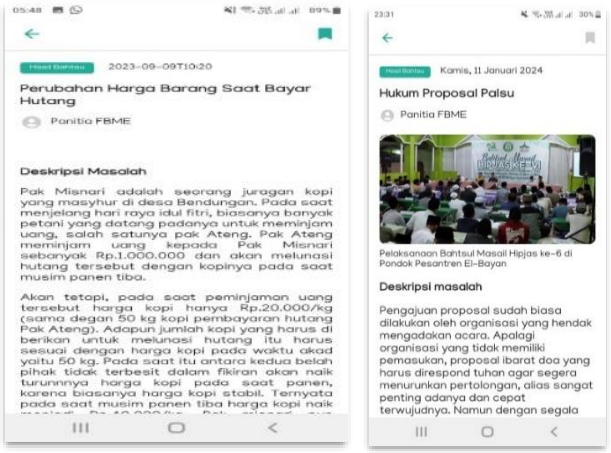

Figure 14. Implementation of Article Details.

Figures 12 and 13 illustrate the precise implementation of the article menu prototype into the application. Features similar to those in the Aurod menu are also functional. Additionally, Figures 14 demonstrate that the data created by the admin and stored in the Firestore database is successfully connected to the application.

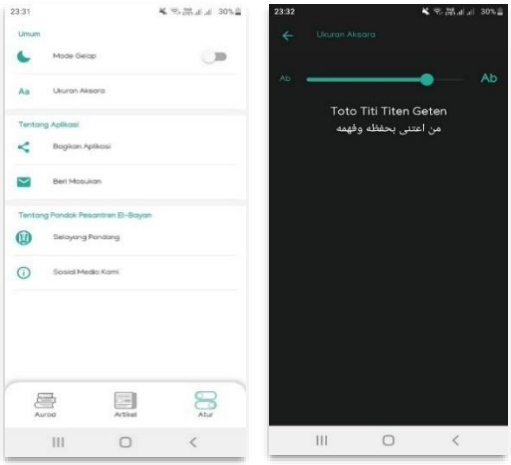

Figure 15. Implementation of the Settings Menu

Discussion

In the Android-based Prayer Collection and News Portal application for PP El-Bayan, there are elements that can be considered as a black box in terms of data processing and the algorithms used to present information to users. For example, the news recommendation system, which displays relevant articles or prayers to users, operates by utilizing user preference data and previous usage patterns. However, the underlying workings of the algorithm, such as how the application determines which news or prayers to display to the user, are not entirely transparent. While users can see the end results—the recommended news or prayers—they are unaware of the detailed processes involved in how the application processes data and makes those decisions. Despite this, the black box model allows the application to provide a more personalized and relevant user experience, although the lack of transparency in data processing can pose challenges in terms of accountability and the interpretation of the results provided by the system.

Table 3. Testing Blackbox

s	Testing	Test Case	Actual Results	Test Results
1	Click Aurod on the Android application	Click Aurod	Displayed Aurod and it worked	in accordance with
2	Click Articles in the Android application	Click Article	Displaying the Article and it works	in accordance with
3	Click Setup on the Android app	Click Set	Display Set up and it works	in accordance with
4	Login using the correct username and password on the website application	Username= "admin" Password= "admin"	Successfully entered the dashboard menu	in accordance with
5	Login using the wrong username and password on the website application	Username and Password are incorrect or not filled in	Incorrect Username and Password error message appears	in accordance with
6	Input aurod and articles pada menu aurod	Fill out all forms correctly	Successfully saved to database	in accordance with

Testing steps This try to justify it feature soft already made of suitable with details of expected wishes. Regarding I also tried this presumption in research This. Procedures used is a User Acceptance Test (UAT) [13] [17]. Author recommend so testing This done in the same amount of time to look skill created application. There are also results UAT calculations can observed in Table 4:

Table 4. UAT Results

Question	Mark					Amount	Analysis (Amount / 15)	Percentage (Analysis /5*100)
	Ax5	Bx4	Cx3	Dx2	Ex1			
What? Display Android-Based Prayer Collection And News Portal Application Of PP El-Bayan This Interesting?	45	28	0	0	0	73	4,8	97%
Is Presentation Information Android-Based Prayer Collection And News	42	28	3	0	0	73	4,8	97%

Portal Application Of PP El-Bayan Easy Understood?								
What? Android-Based Prayer Collection And News Portal Application Of PP El-Bayan Can Accessible Where?	33	32	6	0	0	66	4.4	84%
What? Android-Based Prayer Collection And News Portal Application Of PP El-Bayan Can Accessible With Easy?	30	28	7	0	0	65	4.3	86%
Is The Android-Based Prayer Collection And News Portal Application Of PP El-Bayan Updated?	20	40	3	0	0	63	4,2	84%
What? Android-Based Prayer Collection And News Portal Application Of PP El-Bayan Can Monitoring?	30	28	6	0	0	64	4.26	85%
Is Search And Filter Data On Android-Based Prayer Collection And News Portal Application Of PP El-Bayan Enough Good?	10	48	3	0	0	61	4.06	81%
What? Android-Based Prayer Collection And News Portal Application Of PP El-Bayan Walking With Good?	25	36	3	0	0	64	4.26	85%

From the calculations in table 4 with the average value is 35.08 / 8 = 4.385 so percentage value is 4.385 / 5 x 100 = 87,7%. This matter test hypothesis accepted from application with test reception user is Good. Based on the results obtained, the system falls into the "very strong" category according to Riduwan (2008), who stated that if the percentage reaches between 81% and 100%, the test results can be considered very strong. Therefore, the researcher concluded that the system that has been designed and developed is feasible for implementation.

CONCLUSIONS AND SUGGESTIONS

Based on the research conducted on the prayer collection and news portal application at PP El-Bayan, it can be concluded that the design of the application, which can display the

prayers taught at the pesantren as well as provide current news and Islamic articles, has been successful. The developed application is expected to provide significant benefits for PP El-Bayan and its users, regardless of location. Some suggestions for further development of this application include adding audio features for each prayer, so users can easily recite the prayers correctly. Additionally, it is recommended to add Islamic features commonly used in daily life, such as prayer time reminders, a Qibla direction indicator, Hijri calendar, and a menstruation calculator. The addition of these features is expected to improve the app's usability and provide more benefits to users in their daily activities. The hypothesis test was accepted based on the positive results from user acceptance testing.

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