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Analysis of User *Interface* and *User Experience* Customization in iLamongan Applications based on Dmitry Fedeyev's Theory

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Article Info

ABSTRACT

Local libraries must innovate in developing digital collection services. This study aims to evaluate the user interface and user experience of the iLamongan application based on Dmitry Fedeyev's theory. Researchers used a descriptive qualitative approach. Data search techniques with observation, interviews, and documentation. Data analysis through the process of reduction, presentation, and conclusion drawing. Test validity with triangulation techniques. The results showed that the user interface in the iLamongan application had fulfilled six of the eight aspects. User experience assesses that the presence of iLamongan provides innovation for users who are unable to attend directly to the library. Users still experience technical obstacles such as signal stability and eye endurance when reading for a long time. Feature updates need to pay attention to user needs, such as the absence of light dark mode, reading models, and others. The iLamongan app has fulfilled many aspects of a good UI and provides a positive user experience. However, there is still room for improvement especially in the aspects of efficiency and completeness of the collection. This evaluation is important for further development so that the application can meet user needs.

ABSTRAK

Perpustakaan daerah harus melakukan inovasi pengembangan layanan koleksi secara digital. Penelitian ini bertujuan menganalisis user interface dan user experience pada aplikasi iLamongan berdasarkan teori Dmitry Fedeyev. Peneliti menggunakan pendekatan kualitatif deskriptif. Teknik pencarian data dengan observasi, wawancara, dan dokumentasi. Analisis data melalui proses reduksi, penyajian, dan penarikan kesimpulan. Uji keabsahan dengan triangulasi teknik. Hasil penelitian menunjukan user interface pada aplikasi iLamongan sudah terpenuhi enam dari delapan aspek. User experience menilai hadirnya iLamongan memberikan inovasi bagi pengguna yang berhalangan hadir langsung ke perpustakaan. Kendala teknis pengguna masih dialami seperti stabilitas sinyal dan daya tahan mata ketika membaca lama. Pembaruan fitur perlu memperhatikan kebutuhan pengguna, seperti belum adanya mode gelap terang, model baca, dan lainnya. Aplikasi iLamongan telah memenuhi banyak aspek UI yang baik dan memberikan pengalaman pengguna yang positif. Namun, masih ada ruang untuk perbaikan terutama dalam aspek efisiensi dan kelengkapan koleksi. Evaluasi ini penting untuk pengembangan lebih lanjut agar aplikasi dapat memenuhi kebutuhan pengguna.

1. INTRODUCTION

The development of libraries adjusts to the advancement of technology and information. In the past, libraries were places that contained collections with certain processing so that they could be used by users (Sulistya-Basuki, 1991). This is also supported by government policies regarding libraries as a means of education, research, recreation, information, and preservation of library materials (Indonesia, 2007). The most

important function of the library is realized through the collections provided. The collection provided is tailored to the user's information needs (Sutarno NS, 2018). In today's digital era, our library is transforming into an institution that functions to address various aspects of social needs, cultural development, and literacy development in learning (Nabila et al., 2024). So that with the current era, information sources are not only in the form of books, but other types in accordance with the times, such as digital collections.

Technological developments have had a major impact on the progress of libraries, where users depend on the speed of accessing information. Today's library users who need more information quickly and instantly also place great hopes on the fulfillment of their needs for information (Safri, 2020). Technological developments have changed the pattern of searching for user information. Users used to prefer to visit the library to find the desired collection. This shifts to a library that provides access for users digitally/*Online* (Hartono, 2017).

Digital libraries provide easy access without any limitations of space and time. Information literacy skills are needed to get the desired information. Users can access *e-book, e-journal, e-magazine*, and other sources of information on the digital library. The digital library can be accessed through a website or a mobile application. Digital library innovation provides efficiency for users who are unable to come directly to borrow books (Octaviani & Dewi, 2019).

Regional libraries (Perpusda) innovate in terms of changing the form of print collections to electronic (Rifauddin & Primary, 2020). Related to the change of shape as part of the preservation of library materials and the provision of electronic collection sources. The Library began to transform the collection by re-recording the printed form in journals, books, and other forms to be digital (Sasmitasari & Handayani, 2022). One of the Perpusda that does this is the Lamongan Regency Regional Library. In addition, the management presents a digital library called iLamongan. The iLamongan application is an android/gadget-based digital library application. This application is the result of collaboration between the Lamongan Regency Regional Library Office and PT Woolu Aksara Maya Jakarta as a third party. The digital collection can be accessed by downloading the iLamongan application through *playstore* or *Appstore*.

The iLamongan application as a digital library in its use is related to the interaction between users and computers. The interaction is related to its appearance, features, and ease of use. *User interface* (UI) is the interactive part of a computer system that communicates with the user (Boucher & Yalçin, 2006). The design of the user interface encompasses all aspects of the system visible to the user. In building the UI, the management conducts research and testing on users. Unlike With a view-centric UI, *user experience* (UX) is centered on the convenience, efficiency, and user satisfaction of an application (A. H. Allam and Dahlan 2022). UI evaluation needs to be done with UX as an effort to improve in the future for application developers (A. & Ganggi, 2019). Evaluation can be in the form of clarity in executing orders, aesthetics, efficiency, and so on.

The iLamongan application provides several displays and features to meet user satisfaction. The features provided are in the form of a collection of books, *e-library*, feeds, bookshelves, and *e-reader*. This feature is a UI display for users to meet their information needs. After using, users will get their experience. Features in the app *digital library* Provides ease of accessing information based on needs through display menu

specifications, thus providing an impression and experience for users (Arya et al., 2024). The display of features in the iLamongan application can be assessed based on eight aspects based on Dmitri fedeyev's theory (Don Norman, 2013):

    a. *Clarity* is the foundation of effective communication in design. The designed elements should be easy for users to understand. Information, functions, or interactions should be displayed without confusion or complexity.

    b. *Concision*, information and visual elements should be presented as simply as possible without compromising value or meaning.

    c. *Familiarity*, design elements that follow familiar patterns or conventions will make it easier for users. This reduces learning time and increases comfort.

    d. *Responsiveness*, the system must provide fast and appropriate feedback on user actions. Responsive creates a seamless interaction for users.

    e. *Consistency*, design elements and interaction patterns must be uniform throughout the product. It helps users understand and predict how the system works.

    f. *Aesthetics*, the design must be visually appealing to create a pleasant experience. However, aesthetics must support function, not just decoration.

    g. *Efficiency*, the design should allow users to complete tasks quickly and easily, minimizing unnecessary steps.

    h. *Forgiveness*, the system must minimize the possibility of user error and provide an easy way to correct the error.

This research focuses on UI and UX analysis on iLamongan based on Dmitry Fedeyev's theory. The theory was chosen because it reveals eight aspects that are suitable for assessing and evaluating the appearance of iLamongan mobile applications. Eight important aspects in the UI, namely *clarity*, *conciseness*, *familiarity*, *responsiveness*, consistency, *aesthetics, efficiency*, and *forgiveness*.

2. RESEARCH METHODS

This study uses a descriptive qualitative approach. Researchers dig up data to gain knowledge or theory about research problems at a certain time (Suggestion, 2017). Data sources come from primary and secondary sources. Primary sources come from field research in the form of observations, interviews, and documentation. Secondary sources come from books, journals, and articles that address issues related to UI and UX. Secondary sources are used to strengthen the analysis of the problems in this study.

Data search techniques carried out by researchers by conducting observations, interviews, and documentation. Indirect observations were made by the researcher by making observations on the iLamongan application. Interviews were conducted directly to users who used the iLamongan application randomly with a total of 4 informants. Meanwhile, indirect interviews are conducted by looking at user ratings on *Google Playstore* as additional data. In addition to the overall rating, the author also lists several reviews in the form of images. Documentation is done by taking photos, drawings, or documents related to this problem. Photos are in the form of the iLamongan application display, user reviews, and other photos related to this problem. Data analysis using Miles and Huberman by reducing data, presenting it, and drawing conclusions (Moleong, 2017). Researchers in testing the validity of data by triangulation techniques through comparing data from

observations, interviews, and documentation. The author presents data in the form of narrative text in the form of descriptions.

3. RESULT AND DISCUSSION

iLamongan as a form of digital library as a program from the Lamongan Regency Regional Library Office. This application was first released on January 23, 2020, before the pandemic *COVID-19* happen. The app is now on version 1.0.4 with *update* last on October 5, 2023. Sum *download* at *playstore* has reached more than 1000 downloads (viewed https://play.google.com/store/apps/details?id=mam.reader.ilamongan). The iLamongan application is not just a tols, menu, and button that can be used by users. More than that, the UI is presented as a connection between the user and the experience, a first impression, and a lasting impression (Rochmawati, 2019).

1. *User Interface* on the iLamongan Application

Figure 1: iLamongan App

a. Clarity

Based on observations, the iLamongan application has met the aspect of clarity *(clarity)*, especially in the presentation of information on the main page. The page is designed with a simple and easy-to-understand interface that meets this aspect (Don Norman, 2013). The appearance of the photo of the book accompanied by the title and name of the author clearly. When a user clicks on one of the books, the app provides a main description of the book which includes a synopsis, number of copies, and size *File*. This information is very helpful for users in making choices without confusion.

> *The app also comes with a variety of interactive features that support user convenience, such as adding books to the queue, viewing a list of other book borrowers, and providing reviews. These features make it easier for users to interact with the available book collection and share their experiences with the rest of the user community* (informant 1, 2024).

However, there is one element that is considered less relevant, namely the assessment of ratings on books. The presence of this feature has the potential to be inappropriate because each written work has a certain perspective and value that cannot always be measured objectively through ratings. Removing this feature can strengthen the focus on the essence of the literature and reduce the potential for judgment bias towards a work. The features displayed must be clear so that users do not experience confusion (Rochmawati, 2019). Thus, while most of the design elements of the iLamongan app are already very well designed, improvements to certain elements can improve the overall quality of the user experience.

Figure 2: menu display on the iLamongan application

b. Concise

Brief aspects *(concision)* in the iLamongan application is reflected in the layout and structure of the main display to make it easier for users. The app fulfills the aspect of presenting the various main menus directly on the front page, so users can easily find the features they need without having to open many additional pages (Don Norman, 2013). The main menu consists of various important categories such as books.

The book category contains a list of collections based on a specific theme or genre, e-library categories, and offers access to digital books. In addition, there is a feed or story menu that allows users to share or read stories from the community. The loan menu also displays information related to the book being borrowed. A notification menu is available to ensure users don't miss out on important information, while the search field makes it easier to search for books directly with specific keywords (informant 2, 2024).

The app provides a concisely designed user profile feature. In the profile menu, users can view a list of followers and accounts they follow, log personal information through the private records feature, and access the app's help and policies. There is also an option to log out of the app easily. This simple menu arrangement allows users to efficiently explore the app according to their needs (Rochmawati, 2019). For example, the integrated search field on the main page allows users to quickly find the book they want. Overall, the display and menu structure on the iLamongan app reflects the concise design principle, not only saving users time but also improving the experience.

Figure 3: Menu on the iLamongan app

c. Easy to Recognize

Familiar or easily recognizable aspects *(familiarity)* on the iLamongan application is clearly visible. Consistent and intuitive design, especially on the elements *Header* and *Footer*. This design fulfills the aspect through a uniform layout and visual elements on each page, making it easy for users to understand the app's functions and navigation without the need for long adjustment times (Don Norman, 2013).

Not only do the headers and footers provide an easily accessible navigation guide, but they are also designed with colors that have striking contrasts, helping to distinguish important elements from the background (informant 3, 2024).

The color selection in this application does not seem to be done randomly, but rather has its own meaning that supports aesthetic and functional purposes. The colors used help provide a pleasant visual experience while reinforcing the app's identity. In addition, on the main display, the iLamongan application actively provides book recommendations to users, making them more personal and relevant to users' interests. This feature not only increases convenience but also invites users to continue exploring the book collection on offer. The overall design element should support the familiar aspect, as users can quickly recognize navigation patterns, button functions, and the appearance of other visual elements, thus creating an intuitive and unconfusing experience (Rochmawati, 2019). With this design approach, iLamongan manages to meet the needs of users in an effective and enjoyable way.

d. Responsive

The iLamongan app shows a level of consistency *(consistency)* which is mainly through the use of colors, icons and layouts so that it fulfills this aspect (Don Norman, 2013). Turquoise (similar to the color of salted eggs) and white are used predominantly in the background of the app, creating a uniform and visually pleasing look.

This color selection provides a strong visual identity while ensuring that important elements are easily visible to users. With a consistent design approach, the app gives a professional feel and makes it easy for users to understand the interface structure without any confusion. The layout of the app is also consistent across its pages. The main navigation is always placed at the top of the screen, so users can easily navigate the app without having to adjust to changing positions (informant 4, 2024).

The type of font used remains uniform, creating a neat impression and making it easy to read. The icon design format must also be consistent, both in terms of size, shape, and style, so as to improve visual comfort and minimize misinterpretation by users (Rochmawati, 2019). With consistency in colors, layout, and other visual elements, the iLamongan app manages to create an intuitive, efficient, and engaging user experience (Geasela et al., 2018).

e. Consistent

The iLamongan app shows a level of consistency *(consistency)* which is especially good through the use of uniform colors so that it fulfills this aspect (Don Norman, 2013). Turquoise (salted eggs) and white colors dominate the background of the app, creating a harmonious and easily recognizable look. This color combination not only provides a distinctive visual identity but also helps to increase the user's focus on the important elements in the app.

> *With a consistent color scheme on every page, the app manages to create a comfortable and professional visual experience. Consistency is also reflected in layout, navigation, and other design elements* (Informant 1, 2024).

The main navigation is consistently placed at the top of the screen, making it easy for users to explore the various features without confusion. The type of font used is uniform throughout the application, creating a neat impression and clarifying the information presented. In addition, the icon design format in terms of size, shape, and style remains the same in all parts of the application, making it easier for users to recognize the function of each icon. This consistency provides an intuitive and efficient user experience, making the app easy to use for a wide range of people (Nahla et al., 2024).

f. Aesthetic

In general, the iLamongan application has aesthetic value *(aesthetics)* good, shown through an attractive and simple visual display that fulfills this aspect (Don Norman, 2013). The dominance of turquoise and white colors creates a distinctive identity, giving a clean and professional impression. The main page is dominated by white, which makes text elements and icons clearly visible, supporting visual comfort for users.

> *The color combination provides an elegant visual appeal without looking excessive, creating a modern and user-friendly impression. However, there needs to be an additional dark-light mode for users to adjust the time of use* (Informant 2, 2024).

Despite having an edge in aesthetics, the iLamongan app still has some aspects that can be improved. One of the visible drawbacks is the absence of the dark and light mode feature. Features like this are important to give users the option to adjust the appearance of the application according to the time of use, both day and night (Nahla et al., 2024). Dark mode, for example, can reduce eye strain when reading in low-light environments. With the addition of these features, the iLamongan application will not only improve its visual aesthetics, but also improve overall user comfort.

g. Efficiency

The iLamongan application has not fully achieved the efficiency aspect *(efficiency)*, especially in supporting user comfort when reading. The efficiency aspect must support user comfort with several features available as options (Don Norman, 2013).

> *The book display page does provide quite complete information, such as synopsis, description, and other information. However, this application still has limitations in reading features. One of the notable*

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drawbacks is the lack of an option to change the screen orientation from portrait to landscape or read mode. In fact, landscape mode is often more convenient to use for reading long texts because it allows for larger font displays and wider formats (Informant 3, 2024).

The iLamongan application also does not provide *read mode* As a feature that allows users to read with a page format that is divided into right and left, resembling the experience of reading a physical book. This feature not only improves visual comfort but also helps readers to more easily navigate the page (Octaviani & Dewi, 2019). By adding these two features, the iLamongan application can increase its efficiency while providing a more optimal reading experience for users, regardless of the device used.

h. Forgiveness

The iLamongan application has not fully implemented the aspect *forgiveness* (pardon). This aspect focuses on minimizing user errors and providing an easy way to fix them (Don Norman, 2013). This application already provides a help column that can help users in handling errors. However, this assistance column has not been used optimally.

Users may find it difficult when facing certain problems, because the existing help column has not provided a comprehensive explanation or solution regarding various situations that can occur when using the application (Informant 4, 2024).

The iLamongan app needs to improve the functionality of the help column or add other features that support forgiveness. Additions such as clearer error notifications or the option to undo the wrong action are much needed by users (Octaviani & Dewi, 2019). For example, add a confirmation or undo for an action that cannot be recovered, or provide further tips on what steps to take when an error occurs. Implementing better forgiveness aspects will improve the user experience, provide a sense of security when interacting with the app, and reduce the potential for user frustration.

Figure 4: help menu on iLamongan

Based on the explanation above, it can be concluded that UI in iLamongan based on Dmitry Fedeyev's theory is fulfilled in several aspects. There are several aspects that are not suitable and need to be improved in the future. The UI on

iLamongan does not only display the application, but also how the product works. Improvements to *library mobile* emphasizing the importance of ease of access, attractive appearance, and design that *user-friendly* to improve user satisfaction and prevent them from switching to other better apps or websites (Nahla et al., 2024). The following is a table about UI iLamongan based on Dmitry Fedeyev's theory:

Table 1. Compatibility of user interface with Dmitry Fedeyev's theory

NO.	Aspects	Conformity	
		Appropriate	**Not yet compliant**
1	Clarity	√	
2	Concise	√	
3	Easy to recognize	√	
4	Responsive	√	
5	Consistent	√	
6	Aesthetic	√	
7	Efficiency		√
8	Forgiveness		√

2. *User Experience* **on the iLamongan Application**

After using the iLamongan application, users get experience and impressions. The UI in the app will provide an experience for the user (A. H. Allam & Dahlan, 2022). *User experience* can be submitted directly or provide a review of the application on *playstore*. User experience is directly derived from reviews on *Google Playstore*, as follows:

"Looking for schoolwork references is often through the iLamongan application. Just type in the name of the book you want to look for, then a large selection of books will immediately appear. With iLamongan, the search becomes more effective" (Informant 1, 2024).

"When I have a lecture assignment, I usually look for paper references on the iLamongan application. If you come to the library and look for printed books, it will take longer. So it is more efficient to search for it using iLamongan" (Informant 2, 2024).

"In my opinion, it is still more effective to find library materials in iLamongan than printed books. When I am lazy to leave the house, I can immediately look for reference materials through information technology sources and of course at iLamongan" (Informant 3, 2024).

The three statements from the informant provide an overview of the existence of iLamongan allowing users to access digital information sources. The existence of the application makes users feel the time efficiency and effectiveness of searching for information sources (A. and Ganggi 2019). They can access the library without any restrictions on place and time. The existence of iLamongan helps users from among students as materials for doing schoolwork, papers, final projects, or reading materials to add information. Indirectly, libraries provide

solutions for the community in obtaining knowledge, information, and providing references for academics (Fang et al., 2023). However, there are several obstacles faced by users related to the completeness of the collection.

> *"I sometimes don't find the reference material I want on iLamongan. Finally, I searched elsewhere, for example on the Web"* (Informant 4, 2024).

> *"I searched several times for reference materials for paper assignments, but did not find them in the iLamongan application. There are some books whose titles match the search, but the content is different. So I searched elsewhere, for example in journals, and related articles"* (Informant 1, 2024).

The statements of the two informants above revealed that the experience related to the search for information sources on iLamongan was incomplete. The books presented are still limited because they have to subscribe. Users can provide input related to book recommendations on the application. Some informants stated that in using iLamongan their basic obstacles to user technology, ranging from signals to eye resistance in reading on the application.

> *"I sometimes take a long time to understand the content of books on iLamongan. When reading a book on a smartphone, the screen must be brightened and over time, it causes the eyes to feel tired"* (Informant 2, 2024).

> *"The problem is that if you read a book on your smartphone for too long, your eyes will feel tired, even though you haven't finished reading but you are already disturbed by the tiredness of your eyes"* (Informant 3, 2024).
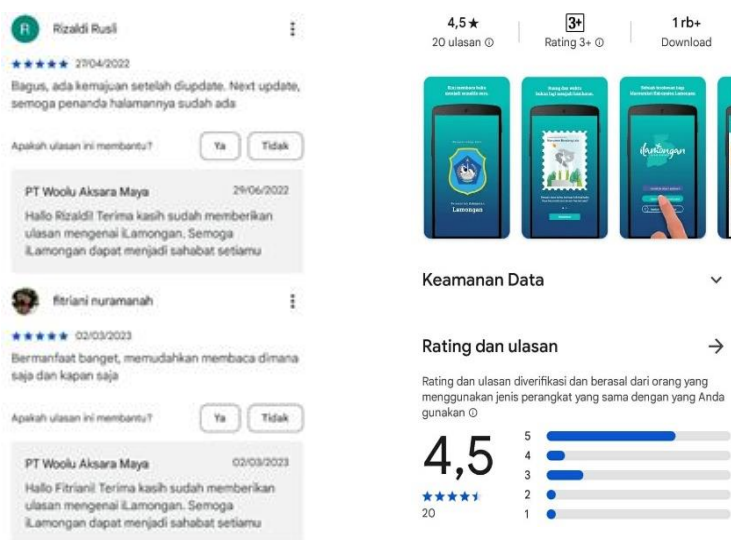
> *"When there is a sudden lecture assignment, I often have difficulty finding reference materials due to unstable signal constraints"* (Informant 4, 2024)

> *"For the obstacle, the signal is definitely difficult. I often use a data plan instead of wifi. When I am in an area where it is difficult to reach the signal, I find it difficult to be able to access iLamongan because of the long loading"* (Informant 1, 2024)

The informant's statement above is related to technical problems from the users themselves. The signal is an obstacle because this application cannot be accessed offline. In addition, eye resistance in reading by staring at *the smartphone* screen is limited. On the iLamongan display, dark and light mode is not yet available for users. Users also gave ratings about the iLamongan application in google *playstore reviews*.

The review is in the form of a rating with a description of the reason for giving the assessment. Users give it an average rating of 4.5 out of 20 reviews. Users appreciate the presence of iLamongan for providing convenience in obtaining information sources. However, some reviews mention an incomplete collection. Previous reviews regarding obstacles in using iLamongan have been followed up during the *latest application* update.

Figure 5 and 6: iLamongan ratings and reviews on google playstore
https://play.google.com/store/apps/details?id=mam.reader.ilamongan

3. UI and UX Analysis Based on Dmitry Fedeyev's Theory

In the compiler of iLamongan, attention is paid to the UI design aspect to provide a good UX. Before *Launcing and Updates* Recently, the management paid attention to user needs. The UI in iLamongan based on Dmitry Fedeyev's theory has been fulfilled in six aspects, namely clarity, conciseness, easy recognition, responsiveness, consistency, and aesthetics. In terms of efficiency and forgiveness, it has not been fulfilled. Library managers need to develop a solid infrastructure, manage diverse digital collections, and implement a platform that *user-friendly* (Amalia, 2024).

After the update, there are several additional features for the convenience of users in finding sources of information. The feature will make it easier for users to maximize the function of the library itself (Octaviani & Dewi, 2019). Additional features include add block user, add block & report content, update reader, and fix bugs. Administrators realize that the existing UI must adapt to the needs of users, so there are additional features as follows:

a. Book collections as a feature containing thousands of titles *e-book*. Users can choose or search and then borrow. However, managers can consider book recommendations from users. So that this application can meet the information needs of users from various circles, especially in Lamongan Regency.

b. *E-library* as a feature that allows members to join as members of the digital library. In the future, managers need to create rooms for members so that they can join the user community. The community can hold events through forums in iLamongan, for example book reviews.

c. Feed as a feature to view all iLamongan user activities. The feed contains information about the latest books, books borrowed by other users, and a variety of other activities. Feeds containing borrowed books need to be removed to maintain user privacy.

d. Bookshelf as a feature of a virtual bookshelf that contains borrowing history and is stored in it.

e. *E-reader* as a feature that makes it easier for users to read ebooks on the iLamongan application. In the iLamongan application, there is no read mode as optional when the user reads. The selection of the background with a light dark background is also not available.

iLamongan application managers need to pay attention to suggestions from users regarding UI improvements. Suggestions can be in the form of directly through the application or reviews on *Google Playstore*. Improvements to adjust user needs to feel comfort and ease in using the application (Geasela et al., 2018). Application-based *Mobile* Provide efficient and sustainable protection of information resources (Fang et al., 2023). Indirectly participating in advancing knowledge and research for the people of Lamongan.

4. CONCLUSION

The analysis of the suitability of *the user interface* (UI) and *user experience* (UX) in the iLamongan digital library application is based on Dmitry Fedeyev's theory which includes eight aspects: clarity, conciseness, easy recognition, responsiveness, consistency, aesthetics, efficiency, and forgiveness. Users feel efficiency and effectiveness in searching for reference materials through iLamongan. Some of the obstacles related to the incomplete and technical collection such as signal and eye resistance when reading on the screen. Reviews on the google playstore show appreciation and some input related to the addition of the collection.

UI iLamongan in general is in accordance with Dmitry Fedeyev's theory. Although there are several aspects that need to be improved, such as efficiency and forgiveness. Feature updates that pay attention to user needs continue to be made. Improvements demonstrate the maintainer's commitment to improving the user experience. The iLamongan app has fulfilled many aspects of a good UI and provides a positive user experience. However, there is still room for improvement, especially in the aspect of efficiency and completeness of the collection. This evaluation is important for further development so that the application can be more effective in meeting user needs.

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