JOURNAL LA MULTIAPP

VOL. 06 ISSUE 01 (102-113), 2025
DOI: 10.37899/journallamultiapp.v6i1.1793

Innovation of Al-Quran Learning Platform with Deepspeech Artificial Intelligence Technology Using Design Sprint Method

Hajon Mahdy Mahmudin[1], Emmy Pratiwi[1]

[1]*Interdisciplinary School of Management and Technology Sepiluh November Institute of Technology, Surabaya, Indonesia*

**Corresponding Author: Hajon Mahdy Mahmudin*
Email: 6047231059@student.its.ac.id

Article Info

Article history:
Received 23 November 2024
Received in revised form 17 January 2025
Accepted 30 January 2025

Keywords:
Artificial Intelligence
Profound Speech
Design Sprint

Abstract

The development of the digital world is increasingly rapid, especially in the era of Industry 4.0 which is marked by advances in information technology. One application of this technology is in learning the Qur'an, the holy book of Muslims which contains divine guidance. This study explores the potential of artificial intelligence (AI) technology, especially Deep Speech, in developing an interactive, adaptive, and easily accessible Qur'an learning platform. This study aims to overcome illiteracy of the Qur'an and improve understanding of the messages of the Qur'an among Indonesian Muslims. Some of the challenges faced in learning the Qur'an in Indonesia include limited accessibility and inadequate learning experiences. This study identifies these problems and offers solutions through the use of AI Deep Speech technology in mobile applications. This technology is expected to increase the effectiveness and interactivity of Qur'an learning and help overcome the barriers of illiteracy of the Qur'an. The results of this study are expected to provide significant benefits for both academics and practitioners in the fields of education and technology. The expected benefits include contributing to the eradication of illiteracy in the Qur'an, the development of AI applications in Qur'an learning, increasing the effectiveness and accessibility of learning, and the development of design sprint methods in the development of technological products. The training model uses Deep Speech supported by TensorFlow, with 30% of the samples used as a validation set to prevent overfitting. The research approach combines qualitative and quantitative methods to gain in-depth insights into user needs and challenges.

Introduction

The development of the digital world is currently growing rapidly. The current industrial revolution era has entered industry 4.0. The industrial revolution era is marked by the increasing diversity and sophistication of information technology in circulation. Information technology is used for various activities, one of which is newspaper learning. The Qur'an is a book of divine guidance and direction for mankind. The Qur'an contains the main religious text for Muslims which is word for word from Allah (Zakariah et al., 2017).

In studying the Qur'an, Muslims are not only required to be able to read and write the letters of the Qur'an, but must also be fluent, understand, appreciate, and practice the contents of the Qur'an (Maliana., 2022). Referring to the speech at the National Seminar on the Strategic Role of Al-Azhar Alumni and the Context of Future Challenges for the Nation, Sunday (23/1/2022)

ISSN: 2716-3865 (Print), 2721-1290 (Online)

by the Deputy Chairperson of the Indonesian Mosque Council (DMI) Commissioner General (Ret.) Syafruddin stated that the number of Muslims in Indonesia is 223 million people, only 35 percent can read the Qur'an and 65 percent cannot read the Qur'an and are generally illiterate. In fact, reading the Qur'an requires learning tahsin, which is perfecting and beautifying the reading of the Qur'an. Al-Qur'an so that the reading is in accordance with the reading rules of the Prophet SAW (Arsyad, 2022). Reading according to the rules is reading by taking out letters that meet the nature of makhraj and paying attention to the rules of tajwid reading (Arsyad, 2022). The theory of studying the law of tahsin is fardhu 'ain or obligatory, this has been mentioned in QS.

Indonesia as a country with the largest Muslim population in the world, is faced with quite a big challenge in understanding and appreciating the Qur'an. Based on the results of the study (Supriadi et al., 2022) it was revealed that around 65% of the total Muslim population of Indonesia have difficulty reading and understanding the Qur'an. This phenomenon shows that the illiteracy rate of the Qur'an is still high among the Indonesian Muslim community. Limited access to studying the Qur'an is one of the factors that influences the low level of mastery of the Qur'an among Muslims. In this context, innovation is needed in providing a place for learning the Qur'an that utilizes technological advances to overcome accessibility constraints and expand the reach of learning the Qur'an.

The low level of Qur'an mastery in Indonesia is not only related to illiteracy, but also includes a less in-depth understanding of the holy text. Factors such as time constraints, lack of qualified teachers, and less supportive learning environments have contributed to the low level of Qur'an mastery among Indonesian Muslims. In addition, changes in lifestyle and learning preferences that tend to follow technological trends also affect the way people choose to study the Qur'an. Therefore, it is important for us to present innovative solutions that can overcome these challenges and increase the accessibility and effectiveness of Qur'an learning. The development of technology, especially in the field of artificial intelligence (AI), has opened up new opportunities in the transformation of Quran learning. The integration of AI technologies, such as speech recognition and natural language processing, can help build a more interactive, adaptive, and accessible Quran learning platform. In this context, this study aims to explore the potential of AI technology, especially DeepSpeech, in the innovative development of a Quran learning platform that can provide a more effective and enjoyable learning experience for the Indonesian Muslim community. Thus, this study not only seeks to address the problem of Quran illiteracy, but also to enrich and expand the way people access and understand the messages of the Quran.

With this research, it is expected to help improve the learning of the Qur'an for Muslims in Indonesia. Where Muslims in Indonesia can read the Qur'an according to its rules (tahsin) while carrying out tahfidz.

Literature Review

In this chapter, the author conducts a literature review focused on the Design Sprint methodology, an innovative approach to product and solution development designed to address complex challenges in a short period of time. The review aims to understand the origins, evolution, and application of Design Sprint across sectors, particularly in technology and education. Through an extensive literature analysis, including journals, books, and case studies, the chapter investigates how Design Sprint has been successfully applied to accelerate innovation, validate ideas, and minimize risk prior to product launch (Cooper, 2019). The study will also identify best practices, challenges faced, and outcomes achieved through the implementation of Design Sprint, which will provide valuable insights for the design and implementation of the innovative Qur'an learning platform in this study.

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Intelligence artificial will applied until learning can done regularly interactive (Ishak et al., 2018). In research previously, the focus was is create platform without through stage validation users. In the research this, validation user done with use design sprint method (Ramli & Yusoff, 2018). According to Senan et al. (2017), in the research previously, the creation of this Al-Quran learning platform intended for for user autism and use method proof or repeat. In the study This is the method used is talaqqi and dedicated for normal users who don't own condition special. In the research previously , the creation Quran application only focused on reading the Quran. In the study this , making Al-Quran application is focused on learning Al-Quran (Shameera et al., 2018). In the research previously , the creation This Quran application intended For memorize or studying the Quran for users who have already understand it . In the research moment this , making Al Quran application is focused on how user can Study reading the Quran comprehensive with help intelligence artificial (Al-Mudara, 2017). In the research previously , focus study is For test level effectiveness help application learning of the Qur'an applied in the J-QAF environment . In this study moment this , object study is How make more Quran application easy For help learning the Qur'an with use Design Sprint approach (Ibrahim et al., 2013). The application of the Design Sprint method in the development of the Intensive Quran Study application has proven to be more effective in creating an intuitive user interface and facilitating learning compared to traditional development methods (Ahmad al Harere, 2023). MFCC implemented For help make it easier search Al-Quran verses on the desktop application . On research this , the focus is create a platform that can help the learning process of the Al-Quran become more easy with design sprint approach (Adhoni & Siddiqi, 2013). In previous research focused on making applications that can improve the quality of reading the Quran by displaying Tajweed rules. While in this study applies the Quran learning technique with validation from design sprint (Darmawan, 2018). In the research previously, no preprocessing is done before do extraction characteristics. Meanwhile, in the research Here, preprocessing is done with a number of stages, namely normalization, deletion silence, and emphasis beginning (Rajagedea & Hastuti, 2021).

This literature study explores the relationship between the concepts of “Design Sprint” and “Quran”, and identifies potential for further research development in this area. Design Sprint , as a methodology for solving problems and testing ideas in a short period of time, has been widely used in the development of digital products and services. The study shows that this methodology has been applied in the development of applications related to the Quran, especially on the Android platform, to facilitate learning and understanding the Quran through digital technology. Distance between two clusters show relatedness cluster in matter quote. The cluster is located close together tend own strong connection with the keywords used in published research. While cluster located more Far tend own lack of relevance strong between keywords. The curvature and thickness of the lines between clusters also reflect relatedness cluster representing number of keywords used in published research (Eck & Waltman, 2021).

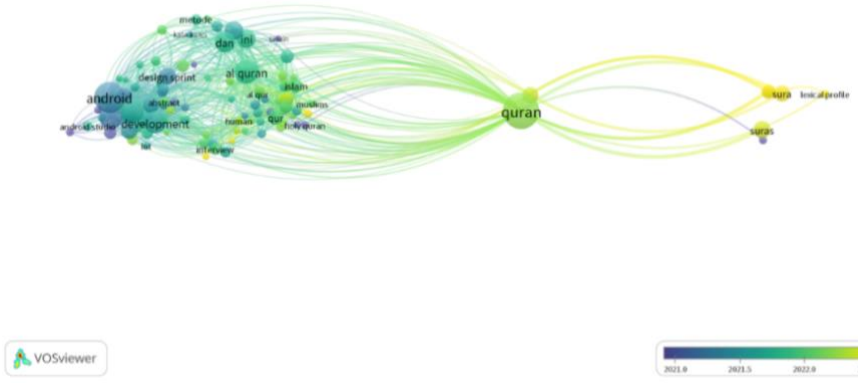

Figure 1. Results of Bibliometric Analysis with VOSviewer

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Use of Design Sprints in development Quran based application technology introduction voice enables developers For understand with fast need users and testing solution in a way effective. Through approach this , the users involved direct in the design process , ensuring the resulting application fulfil need they are good from aspect education and spiritual. Design Sprint encourages innovation in method Al-Quran education with integrate feature interactive and personalized that can increase involvement users. With use technology introduction voice For tajweed checking and transcription Quran reading, application This capable give appropriate material with style Study individual. Research previously, as by Alkhateeb (2020) and Salamun et al. (2022), show that technology introduction sound, especially with MFCC and RNN features, can produce accurate transcription and improve efficiency application education, especially in detect verses and excerpts from the Qur'an.

In the development process, Design Sprint uses technique such as Crazy 8s and Zen Vote for produce various solution creative and choose the best ideas with objective. The resulting prototype through tool design like Figma then tested its uses with involving user real, ensure developed application own intuitive and easy interface used. Testing This using the Usability Scale System (SUS) for evaluate effectiveness, efficiency and satisfaction users. Research that combines MFCC with LSTM models shows performance tall in introduction sound, open opportunity. For develop technology introduction more sound sophisticated. Integration between technology this and the method development product such as Design Sprint has the potential produce more Quran application accurate, efficient and easy-accessible, support development education and religion based on technology.

Methods

This study uses a mixed-method approach, combining a qualitative approach to understand user needs and challenges, and a quantitative approach to measure the effectiveness of the DeepSpeech AI technology-based Quran learning platform. The study began with an exploration stage through literature studies, interviews, and observations to gain in-depth insights into the context and problems in Quran learning. This stage involves the "How Might We" technique to formulate questions that trigger creative solutions. The researcher then used the Design Sprint method in the development stage, including the Understand, Diverge, Decide, Prototype, and Test steps. Solution ideas were generated using the Crazy 8s technique at the Diverge stage, filtered using the Zen Vote method at the Decide stage, and translated into a prototype using Flutter as a framework for cross-platform applications, with DeepSpeech AI technology as a speech recognition engine. This prototype was tested on users to obtain feedback, which was used in design iterations to ensure the solution met user needs. The research schedule was designed for three months, including exploration, data collection, prototype development, testing, and refinement, so that it is hoped that this platform can improve the accessibility and quality of Quran learning effectively and innovatively.

Results and Discussion

Development Stage

In the development stage, this research focuses on the application of the Design Sprint methodology to design an application prototype that suits user needs in technology-based Qur'an learning. Design Sprint was chosen because it is able to structure the development process iteratively through five stages, namely Understand, Diverge, Decide, Prototype, and Validate. Each stage is carried out by actively involving users to ensure that the solutions developed are relevant and effective in improving the Qur'an learning experience. The development process begins with the Understand stage, which is the stage where insights from interviews and observations are translated into specific user needs. Furthermore, in the Diverge and Decide stages, the development team formulates and selects the best ideas to be realized in the prototype. The application prototype created includes key features such as

ISSN: 2716-3865 (Print), 2721-1290 (Online)

DeepSpeech AI-based speech recognition and tajweed pronunciation evaluation, which are expected to provide instant feedback to users. The last stage, Validate, involves testing the prototype with users to obtain feedback for application refinement before the final launch stage.

Understanding Stage

The "Understand" stage aims to understand the problems faced by users and specific needs in the context of the DeepSpeech technology-based Quran learning application. This step begins with data collection through in-depth interviews with prospective users, as well as direct observation during Quran learning sessions. The number of samples involved in this stage was 20 people consisting of Muslim men and women aged 18-35 years and domiciled in Jakarta and Pontianak. Through interviews and observations, several main challenges faced by users were found, including obstacles in pronunciation according to tajwid and accessibility to interactive Quran learning materials.

As part of this process, the How Might We (HMW) approach is used with the HMW Recording Method. . In this method, HMW is recorded in the form of a table containing HMW questions in Indonesian along with opportunities that may arise for each challenge found. The following table summarizes the HMW questions and opportunities that can be used as a basis for developing solutions.

Table 1. How We Can

How Can We (HMW)	HMW Opportunities
How can we make Quranic materials more accessible?	Developing an application-based platform that enables offline and online access for learning.
How can we help users learn the correct pronunciation?	Integrating speech recognition technology to help users verify pronunciation and tajweed.
How can we provide a personalized learning experience?	Provides features that enable adaptive learning as needed, such as specific Tajweed exercises.
How can we engage users who are struggling with motivation?	Added gamification and achievement systems to increase user engagement.

Observations were conducted for 2 weeks from September 3, 2024 to September 16, 2024, divided into two locations, namely the first week in Pontianak and the second week in Jakarta. Observations were conducted on learning the Qur'an in traditional and digital environments, with the aim of understanding the interaction between users and the learning platform. These observations help identify areas that can be improved through the application of speech recognition technology to support automatic pronunciation and tajweed.

This stage provides deep insights into the problems users face and the opportunities that can be leveraged to develop a platform that is more responsive to user needs. These insights form an important foundation for the next steps in the Design Sprint cycle, ensuring that the platform development will focus on the real needs of users and be able to provide a more effective learning experience.

Deviant Stage

In the "Diverge" stage, the Author focuses on exploring various ideas and potential solutions that can address the challenges identified in the "Understand" stage. This stage aims to generate as many creative ideas as possible without thinking about limitations or constraints first, which encourages the author to think broadly and innovatively. The Crazy 8s technique is used in this process to stimulate out-of-the-box thinking from respondents. In Crazy 8s, each member is given eight minutes to quickly draw eight different ideas, where each idea is illustrated for one minute. This process encourages the team to release mental barriers and create a variety of diverse solutions.

ISSN: 2716-3865 (Print), 2721-1290 (Online)

After all ideas were generated, the authors and respondents had a brief discussion to share the main concepts of each idea. This step helped identify patterns or concepts that might be relevant and potentially developed further. Some ideas that emerged at this stage included features such as gamification of learning, setting learning levels according to user abilities, and using personalized avatars to increase user engagement. With the Crazy 8s technique, the Diverge stage allowed the authors to collect rich and diverse ideas, which would be an important foundation for decisions in the next stage. The Four-Step Sketch phase is the process the team goes through to select and develop ideas from the Diverge phase into more focused visual concepts. In this phase, each major feature is illustrated in four steps to provide a more concrete picture of the user flow within the application. Here is a breakdown of the four steps for the features to be developed:

Table 2. Four Step Sketch

Feature	Step 1	Step 2	Step 3	Step 4
Front page	The initial view with the main navigation, showing feature icons such as “Learn” and “Progress”.	Daily recommendation widget or suggested verses to read or memorize.	Search button to search for a particular verse or surah.	News section or important announcements related to application development or learning tips.
Learning	Users choose topics/chapters, such as recitation, pronunciation, or memorizing verses.	Interactive study guide with audio and visual examples of correct pronunciation/taj wid.	Users follow along with the exercises, with guidance or use the speech recognition feature to check pronunciation.	The system provides feedback or evaluation and suggests additional exercises if necessary.
Murajaah	The user selects a surah or verse to repeat.	Users read the verse with an app that uses voice recognition to check pronunciation.	This system provides feedback on pronunciation and tajwid, as well as areas that need improvement.	Users can repeat the murajaah session or move to another verse/surah.
Verse Deposit	The user selects the verse/letter to be saved, then presses the "Save Verse" button.	Users read sentences directly into the app, which uses voice recognition to rate readings.	This system provides an assessment of reading accuracy based on tajwid and pronunciation.	The system saves the result of sentence submission as a record for progress evaluation or to be shared with teachers.
Learning Progress	A summary view of learning progress, including sentences that have been learned, submitted, and reviewed.	Graph/indicator of memorization and pronunciation achievement during a certain period.	Recommendations for the next learning session based on user progress.	Users can access detailed reports or download progress certificates after reaching certain milestones.

This table provides a concise and clear overview of the flow of each feature to help users understand the learning process offered by the application. After completing the “Understand” stage, the research proceeds to the “Diverge” stage using the Crazy 8s technique to explore innovative ideas that can meet user needs. In this session, the authors have eight minutes to quickly sketch eight ideas, with each idea illustrated for one minute. This approach is designed

ISSN: 2716-3865 (Print), 2721-1290 (Online)

to encourage open-ended creativity, allowing each member of the research to come up with fresh ideas that may not have been thought of before. Through Crazy 8s, the study encouraged exploration of early visual concepts of key features, such as “Home,” “Learning,” “Review,” “Poem Deposit,” and “Learning Progress.” This technique facilitated the exploration of multiple ideas, eliminating the mental block that often arises when trying to formulate the perfect idea in the early stages. The results of Crazy 8s were reviewed with respondents to select the most potential and creative ideas, which were then developed further in the “Decide” stage.

Front page

The homepage of the DeepSpeech technology-based Quran learning application is designed to provide an intuitive and accessible user experience, facilitating navigation to key features such as "Learn", "Murajaah", "Setor Ayat", and "Learning Progress". This design creates a positive first impression and directs users to navigate the application efficiently. Several alternative homepage designs were tested to determine the best layout that displays learning progress, quick access to materials, and clear visualization. Some alternatives prioritize grouping materials based on learning categories such as Tilawah, Tahsin, and Tahfidz, and provide additional features such as recommendations, promotions, and quick access icons. The homepage also provides contextual information such as prayer times, user profile icons, and space for important announcements, supporting an adaptive and personalized experience.

Each design alternative focuses on ease of navigation and management of the user’s learning progress, with additional features for tracking what has been learned and completing specific tasks. Some designs include a “Last Learned” section that allows users to resume learning from the last lesson they accessed, as well as promotions for premium services such as “Qara’a Pro” for access to more material. Various designs also feature a more organized structure with key features easily accessible through large icons. These designs not only improve accessibility, but also create a more focused and consistent learning experience, helping users follow a systematic learning path and increasing their engagement in the Qur'an learning process.

Learning Page

The Learning page in the Al-Quran application is designed to provide an interactive and structured learning experience, making it easier for users to understand various aspects of learning such as the introduction of hijaiyah letters, tajweed, pronunciation, and memorization. The design of this page is very intuitive, making it easy for users to navigate through the various learning modules and allowing them to track their progress. Eight alternative wireframes for this page offer variations in the arrangement of features, such as focusing on tracking daily progress with time indicators and materials completed, or grouping materials by category such as Tilawah, Tahsin, and Tahfidz. Some designs also include horizontal tabs to facilitate navigation between categories, such as Chapter Hijaiyah and Chapter Tajweed, providing a more organized learning experience and making it easier for users to navigate the content according to their ability level.

In each design, there are additional features such as “Edit Target” to adjust the daily learning time target, as well as a progress indicator that shows the achievement of material and time spent. Some alternatives offer a more segmented structure with categories such as Tilawah, Tahsin, and Tahfidz, allowing users to choose the learning level that suits their abilities. The use of interactive features such as speech recognition to check pronunciation and audio examples further enhance the learning experience. With the progress indicator, progress bar, and quiz feature, this Learning page aims to provide a structured, effective, and individual learning experience, encouraging users to continue learning and achieve their goals in learning the Qur'an.

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Review Page

The Murajaah page in this application is designed to help users strengthen and maintain their memorization of the Qur'an in an efficient and interactive manner. The main feature of this page is the use of DeepSpeech based speech recognition technology, which allows users to record their pronunciation and get real-time feedback on any tajweed or pronunciation errors. The Murajaah page is designed with eight alternative wireframes that adjust the appearance and navigation to provide easy access and visualization of progress. Users can select a specific surah or verse to repeat, with some alternative designs providing a progress indicator in the form of a bar or number, providing a clear visualization of how much has been learned. This design also offers options for surah categories such as Juz 30 or Selected Surahs, allowing quick navigation between surahs without the need for extensive scrolling.

A simpler design alternative uses a grid to display the surahs with clear names and progress, giving users quick access to select which surah to repeat. Some designs also utilize the Read button to start a live murajaah session with a single click, leveraging AI technology to provide real-time pronunciation correction. This design prioritizes ease of access and simple visualization of progress, motivating users to continue doing murajaah in a structured manner. With these features, the application is expected to improve discipline and accuracy in memorizing and maintain the consistency of users' memorization through technology-based learning that can automatically verify pronunciation.

Verse Deposit Page

The Verse Deposit Page is an important feature in this application that is designed to help users deposit memorized Quranic verses and verify their recitation. This feature allows users to record the recitation of the verses they have memorized and send them to be assessed by competent teachers or scholars. With the support of teachers, users can get direct feedback on pronunciation and tajweed, so that the quality of their memorization can continue to improve. This page provides various design alternatives that make it easy for users to monitor their memorization progress with clear visual indicators, such as a progress bar and tabs based on memorization levels. Users can easily access the surahs they want to memorize through a simple yet functional interface. Some designs offer additional features such as a monthly deposit summary, a quick access button to view progress, and memorization categories based on level (Level 1, Level 2, Level 3). This design provides a structured experience and motivates users to continue their memorization with clearly visible progress. With a feedback system from the ustadz and easy-to-understand visualization of progress, users can continue to develop their memorization effectively and consistently. This feature aims to make the memorization process more focused, structured, and supported by accurate assessments, so that users can achieve a better level of mastery of the Quran.

Deciding Stage

The Decide stage is an important stage in the development process of this application, where final decisions are made to determine the features and designs to be implemented based on the ideas that have been collected and evaluated. At this stage, the team uses the Zen Vote method to select the best ideas effectively and democratically. With the Zen Vote method, each team member has the opportunity to vote on the ideas that are considered most in line with user needs and application goals, without lengthy discussions that can affect objectivity. The Zen Vote process helps streamline decision-making by prioritizing ideas that have the most support from team members. Once ideas are selected, further evaluation is conducted to determine technical feasibility and potential benefits to users. Decisions made at this stage form the basis for further prototyping and final product development, ensuring that the resulting app provides an interactive and effective Quran learning experience for users.

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Front page

At the Decide stage to determine the Home Page design, the Zen Vote method was used to collect preferences from 20 respondents on eight alternative designs proposed. Of the total respondents, 70% or 14 people chose the first alternative by attaching their stickers, indicating that this design best suits the needs and expectations of users.

Table 3. Zen Vote Results Home Page

Name	Alternative Pages							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Voting	14	3	2	1	-	-	-	-

The second alternative design received support from 3 respondents, while the third alternative received 2 stickers. The fourth alternative only received 1 sticker, while the fifth, sixth, seventh, and eighth alternatives did not receive any stickers at all, indicating that both designs were considered less appropriate by respondents. Based on the results of the Zen Vote, the team decided to continue development based on the first alternative that received majority support, by ensuring that the selected Home Page design was in accordance with the preferences of the majority of respondents.

Learning Page

In the Decide stage for the Learning Page, the Zen Vote method was used to determine the design preferences of 20 respondents for the eight available alternatives. From the total votes collected, the majority of respondents, namely 12 people (60%), chose the first alternative. This significant support indicates that the first alternative design is considered to best meet the needs and expectations of users in supporting an effective learning experience.

Table 4. Zen Vote Results Learning Page

Name	Alternative Pages							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Voting	12	4	2	2	1	1	-	-

The second alternative received 4 stickers, while the third and fourth alternatives each received 2 stickers. The fifth and sixth alternatives each received 1 sticker, while the seventh and eighth alternatives received no stickers at all. The results of the Zen Vote led the team to choose the first alternative as the basis for the Learning Page, ensuring that the chosen design matched the preferences of the majority of respondents.

Review Page

On the Murajaah Page, the Decide process is carried out using the Zen Vote method to identify the design that best suits user preferences. Out of 20 respondents, 13 people (65%) chose the first alternative, indicating strong support for this design as the primary choice that suits the needs of murajaah users.

Table 5. Zen Voting Results Murajaah Page

Name	Alternative Pages							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Voting	13	3	2	2	-	-	-	-

The second alternative gets 3 stickers, while the third and fourth alternatives each get 2 stickers. The fifth, sixth and seventh alternatives each receive 1 sticker, and the eighth alternative does not receive a sticker. Based on the Zen Vote results, the team decided to develop the Murajaah Page based on the first alternative which was supported by the majority of respondents.

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Verse Deposit Page

The Decide Stage for the Syair Deposit Page also used the Zen Vote method, where 20 respondents were asked to choose from eight alternative designs. As a result, 15 people (75%) chose the first alternative, indicating that the majority of respondents supported this design as the most appropriate for the feature. Poetry Deposit.

Table 6. Zen Voting Results Send Poetry Page

Name	Alternative Pages							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Voting	15	3	1	1	-	-	-	-

The second alternative received support from 3 respondents, while the third and fourth alternatives each received 1 sticker. The fifth, sixth, seventh, and eighth alternatives received no stickers at all, indicating that these designs were less attractive to respondents. With these results, the team chose to continue developing the Verse Deposit Page based on the first alternative, which was chosen by the majority of respondents as the best design.

Prototype Stage

The Prototype stage is an important step in the application development process, where the concepts and designs that have been decided in the Decide stage are realized in the form of an interactive prototype. This prototype serves as an early version of the application that allows the development team and other stakeholders to evaluate and test the planned workflow, appearance, and main features. At this stage, the team focuses on translating ideas and design decisions into visual and interactive elements that can be tested, thus providing a real picture of how the application will function for users. This prototype also serves as a tool to obtain early feedback from users and respondents, so that the team can make necessary adjustments or improvements before entering the final development stage. With a prototype, the team can ensure that the application being developed is in line with user needs and provides an optimal experience.

In making this prototype, the selection of colors and typography plays an important role in building a modern and user-friendly visual identity for the application. The main color used is purple with the HEX code #A760FF and RGB 167, 96, 255. This color gives a fresh and professional impression and reflects a calm and focused impression, supporting users in the process of learning the Quran which requires calm and concentration. The typography used in this application is Plus Jakarta Sans, which is a modern font that is easy to read and gives a simple yet elegant impression. Various bold variants, from Regular to Extrabold, provide flexibility in composing text according to the needs of the information hierarchy in the application. The use of this font helps create a consistent and easily understood appearance for users, so that messages and content in the application can be conveyed clearly and effectively.

User Testing

The test results show that the prototype of the Qur'an learning application successfully met the expectations of the majority of respondents, with a very good level of acceptance. The average score on the learnability indicator reached 78%, indicating that the application is easy to use for new users, with intuitive guidance and interface. On the memorability indicator, the application scored 82%, indicating that the consistent design helps users remember the application's functions and navigation easily. The efficiency of the application is reflected by the highest score of 85%, indicating that the application can speed up the learning process compared to traditional methods, with efficient navigation and fast response times. The errors indicator showed a score of 75%, reflecting that the error rate was very minimal and did not interfere with the learning process. User satisfaction was very high, with an average score of

ISSN: 2716-3865 (Print), 2721-1290 (Online)

87%, indicating that this application meets the needs of learning the Qur'an digitally with a user-friendly design, good technical stability, and features that support efficient and enjoyable learning. Overall, these results provide important validation that the application prototype can be implemented further, with some minor improvements to improve the user experience.

Conclusion

The results of the usability test on the prototype of the Al-Quran learning application showed very positive performance, with 20 respondents providing feedback leading to the conclusion that this application meets the needs of effective and enjoyable digital learning. With an average score of 78% on the learnability indicator, the application proved easy to understand by users, even those who were using it for the first time, thanks to its intuitive interface and clear guidance. In addition, an average score of 82% on the memorability indicator showed that the application's consistent interface design made it easy for users to remember the application's functions and layout, thus supporting smooth learning without obstacles. The highest score on the efficiency indicator (85%) indicated that this application was able to accelerate the learning process, allowing users to complete tasks faster compared to traditional methods. The very low error rate (75%) indicated that this application was stable and reliable, with errors found not significantly affecting the learning experience. User satisfaction was also very high, with an average score of 87%, reflecting that this application succeeded in providing a comfortable, efficient, and expected learning experience. Overall, these results confirm that the application has met good usability standards, worthy of being implemented into production with some minor improvements based on the feedback received.

Recommendation

This study recommends several strategies to optimize the innovation of a Qur'an learning platform using DeepSpeech AI and the Design Sprint method. Policymakers and educational institutions should provide funding and infrastructure to support the integration of AI in religious education, ensuring scalability and inclusivity, particularly for underprivileged communities in remote areas with limited internet access. Continuous development through iterative testing and user feedback is crucial to creating a user-centered platform that addresses diverse learning needs, while features for teacher integration can bridge the gap between traditional and technology-driven methods. Gamification elements, such as achievement badges and progress milestones, should be included to enhance user engagement, particularly for younger learners. Future research should explore advanced AI techniques like natural language processing (NLP) for deeper text comprehension and conduct comparative studies to evaluate the effectiveness of technology-driven versus traditional learning. Additionally, cross-sector collaborations with NGOs, tech companies, and religious organizations can expand the platform’s reach and impact, ensuring the delivery of a consistent, high-quality, and accessible Qur'an learning experience.

References

Adhoni, Z. A., & Siddiqi, A. A. (2013). A programming approach for the digital Quran applications. *International Journal of Engineering & Computer Science IJECS-IJENS*, *13*(05).

Alkhateeb, J. H. (2020). Approach learning machine For recognize Quran Reader . *Journal International Knowledge Computers and Applications Continuation (IJACSA), 11* (11), 268–271.

Arsyad, D. S., Westerink, J., Cramer, M. J., Ansar, J., Wahiduddin, Visseren, F. L., ... & Ansariadi. (2022). Modifiable risk factors in adults with and without prior cardiovascular disease: findings from the Indonesian National Basic Health

ISSN: 2716-3865 (Print), 2721-1290 (Online)

Research. *BMC Public Health*, *22*(1), 660. https://doi.org/10.1186/s12889-022-13104-0

Cooper, R. G. (2019). The drivers of success in new-product development. *Industrial marketing management*, *76*, 36-47. https://doi.org/10.1016/j.indmarman.2018.07.005

Darmawan, D. (2018). Learning reading the Qur'an through mobile applications . *ICONQUHAS & ICONIST*, *1* (1), 1–8.

Eck, N.J., & Waltman, L. (2021). Clustering publication based on quote use CitNetExplorer and VOSviewer . *Scientometrics* , *126* (2), 1053–1070. https://doi.org/10.1007/s11192-020-03792-5

Ibrahim, N. J., Razak, Z., Idris, M. Y. I., Yusoff, Z. M., Noor, E. N. M., & Rahman, N. N. A. (2013, June). Mobile application of al-quran and Arabic language for interactive and self learning assistant for support in j-qaf learning: a survey. In *Seminar Kebangsaan Penyelidikan J-QAF* (pp. 205-218). Princeton, NJ, USA: Citeseer.

Ishak, S. F., Zaki, Z. M., Mohamad, K. A., Sayuti, M. N. S. M., Bahrin, M. A. M., Roni, N. H. A., & Musa, M. A. (2018). Formative evaluation of an educational mobile application: an interactive my Qiraat application. *International Journal of Engineering and Technology (UAE)*, *7*(4), 75-79. http://dx.doi.org/10.14419/ijet.v7i4.15.21375

Maliana, R., & Diana, H. A. (2022). Analysis of Learning Obstacle on Circle Material at SMPS Nasional Amanah Bangsa. *Indo-MathEdu Intellectuals Journal*, *3*(1), 1-13. https://doi.org/10.54373/imeij.v3i1.29

Rajagede, R. A., & Hastuti, R. P. (2021). Al-Quran recitation verification for memorization test using Siamese LSTM network. *Communications in Science and Technology*, *6*(1), 35-40. https://doi.org/10.21924/cst.6.1.2021.335

Ramli, R., & Yusoff, Y. (2018). E-Iqra': Application mobile For learn the Quran using introduction voice . *Advanced Science Letters*, *24* (3), 1666–1669. https://doi.org/10.1166/asl.2018.11073

Salamun, S., Amin, K., Elvitaria, L., & Trisnawati, L. (2022). Artificial Intelligence Automatic Speech Recognition (ASR) untuk pencarian potongan ayat Al-Quâ€™ran. *Jurnal Komputer Terapan*, *8*(1), 36-45. https://doi.org/10.12345/jpcr.12345

Senan, N., Ab Aziz, W. A. W., Othman, M. F., & Suparjoh, S. (2017). Embedding repetition (Takrir) technique in developing Al-Quran memorizing mobile application for autism children. In *MATEC Web of Conferences* (Vol. 135, p. 00076). EDP Sciences. https://doi.org/10.1051/matecconf/201713500076

Shameera, A. W. F., Nadhira, A. K. F., & Shafrana, A. K. F. (2018). Toward an extensive mobile friendly Nakhtim Al-Quran application. Oluvil , Sri Lanka.

Supriadi, U., Supriyadi, T., & Abdussalam, A. (2022). Al-Qur'an literacy: A strategy and learning steps in improving Al-Qur'an reading skills through action research. *International Journal of Learning, Teaching and Educational Research*, *21*(1), 323-339. https://doi.org/10.26803/ijlter.21.1.18

Zakariah, M., Khan, M. K., Tayan, O., & Salah, K. (2017). Digital Quran computing: review, classification, and trend analysis. *Arabian Journal for Science and Engineering*, *42*, 3077-3102 . https://doi.org/10.1007/s13369-016-2189-9

ISSN: 2716-3865 (Print), 2721-1290 (Online)