Jurnal Inovasi Informatika dan Bisnis Digital (JIIBD)

Website: https://ioinformatic.org/index.php/JIIBD

Maret 2026. Vol. 1. No. 2; e-ISSN: 3123-6162

Design of a Mobile-Based Online Guitar Learning Platform Using the Agile Method

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Abstract

This study aims to design a mobile-based online guitar learning platform using the Agile method. The background of this research is the high public interest in learning guitar, alongside the lack of structured and beginner-friendly learning media. Agile was chosen for its flexibility, iterative process, and focus on continuous user feedback. The platform was developed using Flutter and includes key features such as basic guitar materials, video tutorials, interactive practice via a virtual fretboard, and a feedback form for questions and suggestions. Testing results show the application runs smoothly, is responsive, and is user-friendly for beginners. This platform is expected to make guitar learning more effective, structured, and enjoyable, and to contribute positively to the development of digital music education.

Keywords*: guitar learning platform, agile, flutter, digital music, mobile application.*

1. Introduction

Music continues to evolve rapidly, with the emergence of new genres such as pop punk, indie, EDM, and lo-fi. Along with these developments, musical instruments have also experienced significant changes. The guitar, in particular, remains one of the most popular instruments due to its affordability, accessibility, and versatility in various genres of music [1]. It can be played across different contexts—from casual entertainment at home to professional performances—making it a socially engaging instrument [2].

Despite its popularity, many beginners struggle to learn guitar effectively because of limited access to structured learning materials. While some rely on private lessons, which provide direct guidance, such approaches often involve high costs and scheduling constraints. On the other hand, online resources like YouTube or Instagram offer an abundance of tutorials, yet they lack systematic progression and interactivity [3]. As a result, beginners frequently face difficulties in mastering the fundamental techniques such as strumming, finger placement, and chord transitions [4].

With the rapid advancement of digital technology, online learning platforms have emerged as an alternative medium for music education. These platforms enable learners to study independently at their own pace while integrating multimedia elements such as video, interactive exercises, and feedback mechanisms [5]. In particular, digital music learning platforms have proven effective in increasing student engagement, improving practice efficiency, and making learning more accessible for diverse user groups [6].

Based on this context, this research proposes the design of a mobile-based online guitar learning platform using the Agile method. Agile offers an iterative and user-focused approach, enabling continuous updates and adjustments according to learner needs. By applying Agile in combination with Flutter as the main development tool, the proposed system aims to provide a responsive, structured, and interactive solution to support beginner guitar learning.

2. Literature Review

2.1 Agile Method

Agile is a software development methodology that emphasizes adaptability and responsiveness in the face of change. Unlike traditional models such as Waterfall, which proceed sequentially, Agile organizes work into iterations or sprints that allow teams to continuously evaluate progress and incorporate feedback. This flexibility makes it especially suitable for projects where requirements may evolve during development. In this research, Agile was chosen because it provides a structured yet adaptable approach that ensures user feedback can be integrated directly into the learning platform's design [7]. Several studies also highlight that Agile enhances collaboration between developers and stakeholders, leading to more relevant and user-centered products.

2.2 Flutter Framework

Flutter is an open-source framework developed by Google for building cross-platform applications using a single codebase. It provides a

fast development cycle with its hot reload feature and offers a wide range of customizable widgets for building responsive interfaces. Flutter is particularly advantageous for educational applications since it ensures consistency across Android and iOS devices without requiring separate development processes. The decision to use Flutter in this project is based on its proven ability to deliver efficient and visually appealing mobile applications in a shorter timeframe, which aligns with Agile's iterative development cycles [8].

2.3 Online Learning Platforms

Online learning platforms have become an essential medium in modern education. They provide learners with access to structured content that can be studied flexibly, independent of time and place. Such platforms usually integrate multimedia, discussion forums, and assessment tools to enrich the learning experience. Prior research shows that these platforms can improve learner motivation and accessibility, offering a broader reach compared to conventional face-to-face methods. The use of online platforms for music learning, therefore, provides an opportunity to deliver materials systematically while maintaining interactivity.

2.4 Digital Music Learning

Digital music learning refers to the use of technology and online systems to teach and practice musical instruments. With the help of video tutorials, interactive applications, and gamified practice, learners can progress at their own pace. Studies have found that digital music education improves engagement, motivation, and retention of knowledge, especially among beginners. In this study, the proposed guitar learning platform adopts this principle by integrating video lessons and interactive components to ensure that users gain both theoretical knowledge and practical skills.

2.5 Guitar Theory

The guitar, as one of the most widely played musical instruments, is categorized as a chordophone. It produces sound through vibrating strings and has become a fundamental instrument in a wide range of music genres [1]. To master the guitar, beginners must understand its basic components, such as chords, scales, and strumming patterns. Theoretical knowledge, combined with regular practice, provides a strong foundation for advancing to more complex skills [4]. Thus, the inclusion of basic guitar theory in the application ensures that learners are not only able to imitate but also understand the principles behind their practice [9].

3. Method

This research employed the Agile method with the Scrum framework. Development was divided into short iterations (sprints), each focusing on a specific feature. The stages included requirement gathering, design, development, testing, and deployment. The use of Agile ensured that each sprint delivered a working product increment that could be reviewed and improved continuously. Every sprint involved team collaboration, regular meetings, and evaluations that contributed to the gradual completion of the system.

3.1 Data Collection

Data collection in this study was carried out using several approaches. First, surveys were distributed to beginner guitar learners to understand their needs, difficulties, and preferences in digital learning. Second, direct observations were conducted on existing digital platforms to analyze their strengths and weaknesses. Finally, a literature review was performed to support theoretical foundations and identify best practices in similar research. These combined approaches helped ensure that the developed platform addressed real user needs while also being grounded in prior research. The combination of surveys and literature reviews also allowed triangulation of data, strengthening the validity of the requirements gathered.

3.2 Tools and Technologies

The development process utilized both hardware and software tools. On the hardware side, a computer with an Intel® Core™ i5 processor was used to handle development tasks, while a Schecter SGR guitar, NUX MG-300 effects, and amplifier were employed to test and demonstrate practical guitar learning. On the software side, Flutter was used as the main development framework due to its cross-platform support. MySQL was applied for managing data storage, while Visual Studio Code served as the integrated development environment. CSS was used for styling the interface to make it visually appealing and user-friendly. The choice of these technologies was made based on availability, compatibility, and efficiency in supporting the Agile approach.

3.3 Development Process

The development process followed Agile practices through these steps:

1. User Needs Identification: Gathering detailed requirements from beginner guitar learners.
2. Creation of User Stories: Translating needs into user stories that guided feature development.
3. Interface and System Architecture Design: Creating mockups and designing a modular system architecture that allowed future scalability.
4. Iterative Prototyping and Testing: Building prototypes in each sprint, then testing them with users to gather feedback. This process ensured that adjustments could be made immediately without waiting until the end of development.
5. Beta Testing and Refinement: Distributing the application to a limited group of users for real-world testing and making adjustments based on feedback. This stage focused on improving usability, correcting bugs, and ensuring stability.
6. Final Release: Delivering the final version of the platform that integrates all validated features and improvements, accompanied by documentation for easier future maintenance.

This step-by-step process ensured that the application was not only technically functional but also aligned with the expectations and learning styles of beginner guitar learners. By adopting Agile, the development team was able to respond quickly to user feedback, reduce risks, and deliver a high-quality product that meets educational objectives.

4. Results and Discussion

4.1 Results

The results of the system implementation are presented in the form of a mobile-based guitar learning application. The system was developed using Flutter and follows the Agile development process, ensuring that the final product integrates user feedback and meets the needs of beginner learners.

The following screenshots illustrate the main features of the application:

Figure 1. Login Page
The login page provides access control, allowing users to enter their accounts securely before accessing the main features.

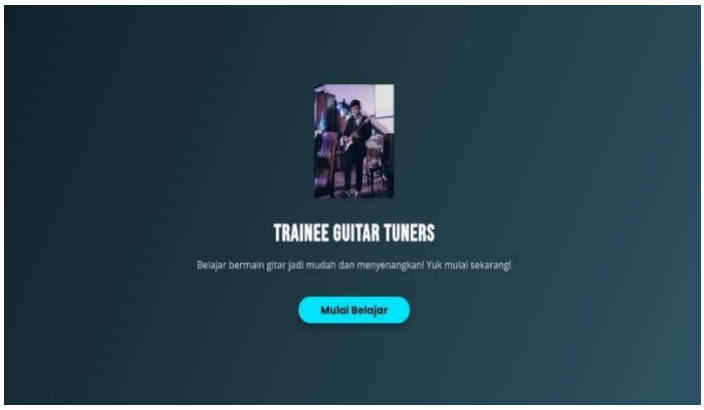

Figure 1. Login Page

Figure 2. Main Menu
The main menu displays the available features such as learning materials, video tutorials, interactive fretboard, and feedback form.

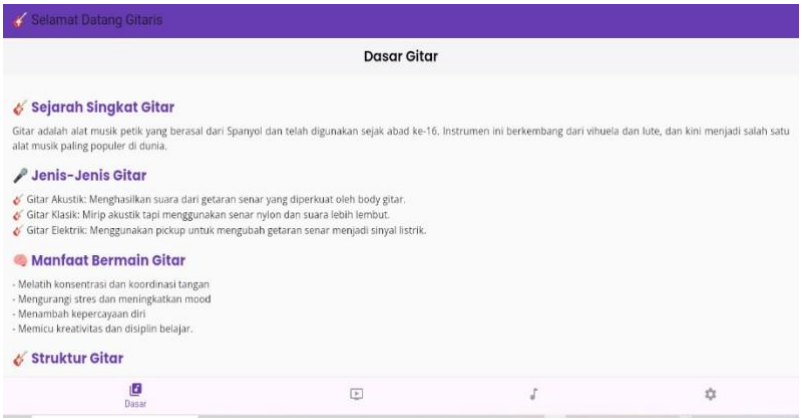

Figure 2 . Main Menu

Figure 3. Basic Guitar Lessons Page
This section contains structured lessons including guitar anatomy, chords, and scales, designed to build foundational knowledge.

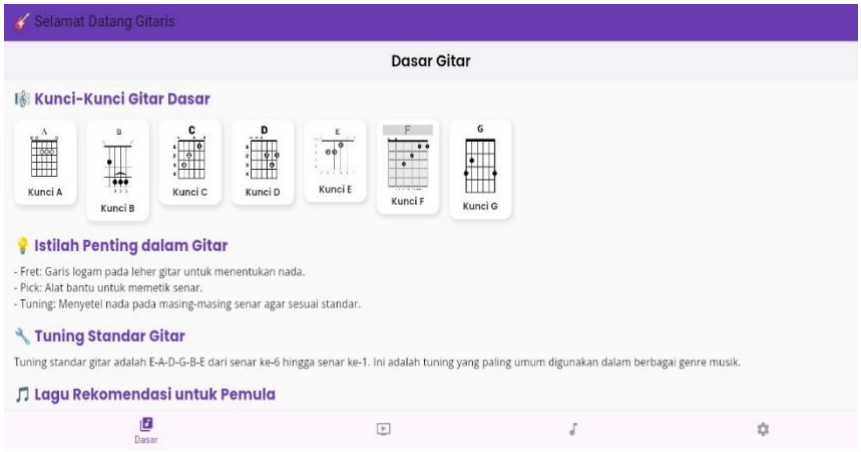

Figure 3. Basic Guitar Lessons Page

Figure 4. Video Tutorial Page
Video-based lessons are integrated into the application to provide step-by-step instructions on playing techniques. This feature supports self-paced learning.

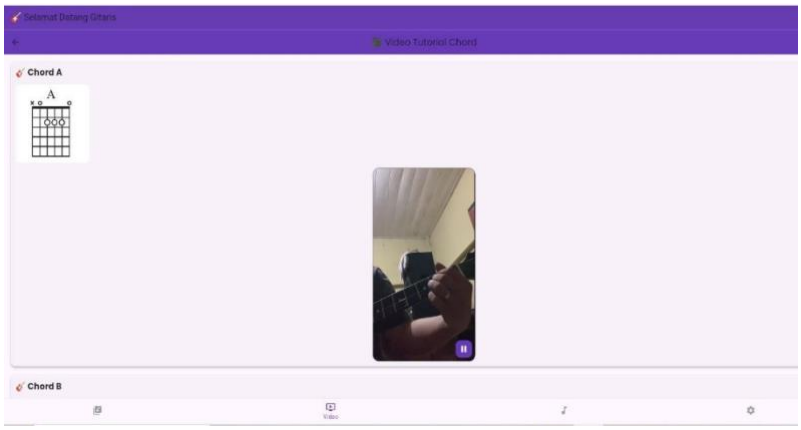

Figure 4. Video Tutorial Page

Figure 5. Interactive Fretboard Page
The interactive fretboard enables users to visualize finger placements and practice chord transitions directly on their device.

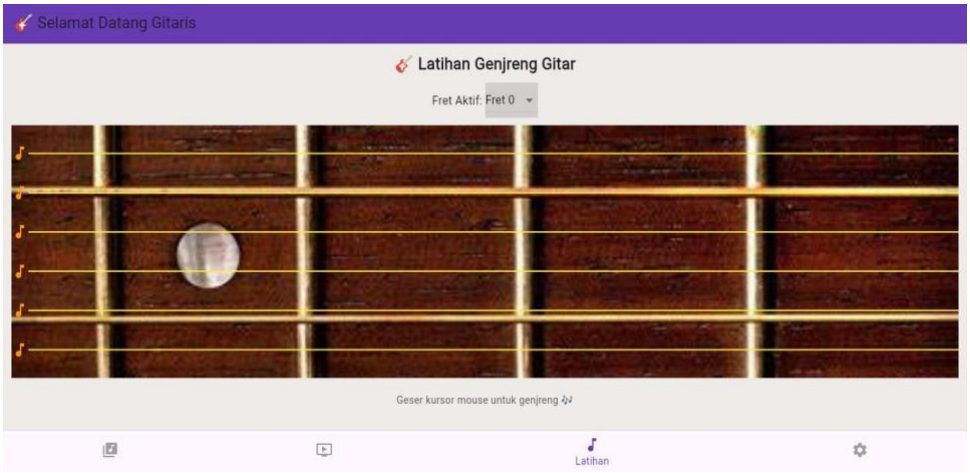

Figure 4. Interactive Fretboard Page

Figure 6. Feedback Form Page
The feedback form allows users to share their opinions, questions, and suggestions. This feature ensures the application can be improved continuously through user input.

Figure 5. Feedback Form Page

4.2 Discussion

Based on application testing, the system runs smoothly and is highly responsive on mobile devices. The structured material helps beginners overcome common difficulties such as chord transitions and strumming patterns. The integration of video tutorials increases user motivation and supports multimedia learning, consistent with previous studies on digital learning platforms.
The interactive fretboard is particularly effective in helping learners visualize and practice chords. This innovation enhances engagement and provides a hands-on experience comparable to physical practice. The addition of a feedback feature reflects Agile's principle of continuous improvement through user collaboration.
Compared with conventional learning methods, this application offers higher flexibility and accessibility. Users can learn at their own pace and time, which aligns with the concept of online learning that emphasizes independence and flexibility. The use of Flutter ensures consistent performance across platforms, reducing barriers for diverse users.
Overall, the application demonstrates how digital technology can be effectively applied to music education. It contributes to bridging the gap between informal online tutorials and structured traditional lessons by offering systematic content, interactivity, and ease of use.

5. Conclusion

Based on the system design and implementation, the following conclusions were obtained:

1. By applying the Agile method, the platform was successfully developed to provide structured, interactive, and user-friendly guitar learning for beginners. The integration of features such as basic guitar lessons, video tutorials, an interactive fretboard, and a feedback form supports systematic and enjoyable learning.
2. The application increases accessibility and efficiency in learning guitar, helping beginners practice independently while maintaining motivation. The design and use of Flutter also ensure the application can run smoothly across devices, making it practical for real-world use.

The following are some suggestions that can be provided for further system development:

1. At present, the platform focuses only on beginner-level learning. Future development is recommended to expand the materials with advanced guitar techniques such as palm muting, arpeggio, bending, and harmonic exercises, as well as adding real-time interactive features such as a tuner or chord detector.
2. The feedback form is still local and not connected to an online database. It is suggested to link this feature with a backend service so that communication with developers and continuous updates can be carried out more effectively. This improvement would also make the application more scalable and adaptive to user needs.

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