

Review Article

Digital Innovations in Petanque Sport: A Study on the Perceived Benefits and Barriers of Using an Android-Based Application

Muchamad Arif Al Ardha^{1*}, Kolektus Oky Ristanto², Rizky Muhammad Sidik³,
Muhammad Kharis Fajar⁴, Advendi Kristiyandaru⁵, Sauqi Sawa Bikalawan⁶,
Oce Wiriawan⁷, Kukuh Pambuka Putra⁸

¹ Department of Physical Education, Universitas Negeri Surabaya, Surabaya, Indonesia

² Department of Physical Education, Universitas Negeri Surabaya, Surabaya, Indonesia

³ Department of Sport Coaching, Universitas Negeri Surabaya, Surabaya, Indonesia

⁴ Department of Sport Coaching, Universitas Negeri Surabaya, Surabaya, Indonesia

⁵ Department of Physical Education, Universitas Negeri Surabaya, Surabaya, Indonesia

⁶ Department of Physical Education, Universitas Negeri Surabaya, Surabaya, Indonesia

⁷ Department of Sport Coaching, Universitas Negeri Surabaya, Surabaya, Indonesia

⁸ Department of Physical Education and Health, Universitas Kristen Satya Wacana, Salatiga, Indonesia

* Corresponding Author : Muchamad Arif Al Ardha

Abstract, The rapid evolution of digital technology has significantly impacted various sports, including niche ones like petanque. This study explores the perceived benefits and barriers of using an Android-based application for scoring and statistics management in petanque, a sport gaining popularity in Indonesia. Traditionally, performance assessment in petanque relied on manual, paper-based methods, prone to inaccuracies and inefficiencies. An Android app, Petanque Match Statistics, was developed to address these challenges, offering real-time data accuracy, improved workflow, and enhanced performance analysis. This study employed a quantitative approach, surveying 50 participants (35 players and 15 coaches) in Surabaya, Indonesia, to assess their impressions of the app's usability, accuracy, efficiency, and overall satisfaction. Results indicated high ratings across all parameters, with no significant differences between players and coaches. The app was commended for its intuitive design, reliability, and time-saving efficiency. Findings highlight the potential of digital solutions to modernise petanque match administration, enhance strategic decision-making, and improve the user experience. The study underscores the importance of user-centred design in facilitating the adoption of digital advancements in sports, offering valuable insights for future developments in petanque and other emerging sports.

Keywords: Android Application, Digital Innovation, Performance Analysis, Petanque, Sports Technology,

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1. INTRODUCTION

Rapid technological advancements have significantly impacted many aspects of sport, including performance analysis, match administration and spectator engagement (Cossich et al., 2023). In line with this trend, digital innovations are progressively being implemented in specialised sports, such as petanque, to improve efficiency and accuracy in performance assessment and monitoring (Goes et al., 2019). Petanque, although relatively new to Indonesia, has attracted considerable interest both as a recreational activity and competition under the auspices of the Indonesian Petanque Sports Federation, (Putra et al., 2022). With its growing popularity, there is an urgent need to implement contemporary solutions to overcome the constraints of conventional methods in statistical assessment and administration (Nasution et al., 2023).

Historically, scoring and performance analysis in petanque have been conducted manually, relying on paper-based records and subjective assessments (Isdarianti et al., 2023). These traditional methods, while effective, are prone to errors, delays, and inconsistencies, especially in high-pressure matches. Data recording inaccuracies can result in

disagreements, hinder strategic decision-making, and ruin the overall experience for players, coaches, and referees (Permadi & Lubis, 2022). These issues emphasise the importance of adopting digital solutions that ensure real-time data accuracy, optimise operations, and enable comprehensive performance evaluation (Singh & Jain, 2015).

To address these issues, the creation and deployment of an Android application for the administration of scoring and statistics in petanque has emerged as a viable alternative (Hidayah et al., 2024). Utilising digital technology, such programmes provide many advantages, including automated assessments, immediate access to performance data, and the capacity to evaluate past records for training and strategic planning (Gracia Sinaga, 2019). Effective implementation of such improvements, however, requires more than just technological functionality; it relies on the acceptance, understanding and confidence of key users-players, coaches and officials (Pratiwi et al., 2024).

This study sought to investigate the perspectives of petanque players and coaches regarding the utilisation of Android-based applications for scoring and statistics administration. The research examined the perceived benefits and barriers associated with the application to gain a thorough understanding of its efficacy and issues that may hinder its general adoption. The research aims to shed light on the elements that influence user acceptance, thus providing significant insights for future advancements in the integration of digital technology in petanque and other nascent sports.

The results of this study are expected to inform app developers and stakeholders within the petanque community, as well as serve as a reference for broader projects in the digitalisation of sport management and the enhancement of the experience for athletes and coaches. It underlines the convergence between tradition and innovation in sport, illustrating how technology can drive progress in achieving competitive advantage and enhancing customer delight.

2. RESEARCH METHODS

This research uses quantitative data collection methods to thoroughly examine the perceptions of petanque players and coaches regarding an Android-based scoring and statistics application called Petanque Match Statistics on this site <https://play.google.com/store/apps/details?id=com.petanquestats&hl=en&pli=1>.

This research was conducted in Surabaya, Indonesia, where petanque has been increasingly recognised as a competitive activity. The research focused on players and coaches involved in petanque matches and training, ensuring the participants had expertise relevant to the activity to provide valuable observations regarding the usability and problems of the application.

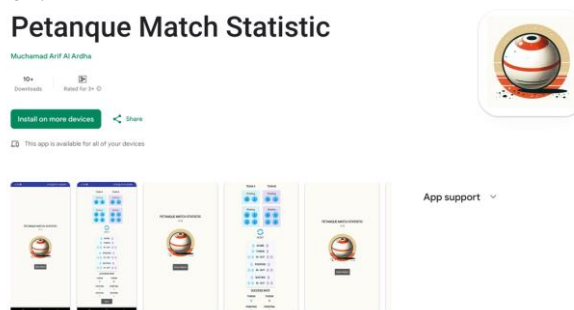


Figure 1. Petanque Match Statistic Apps

The quantitative aspect of the study was a survey that aimed to evaluate users' impressions of the app's advantages and barriers. The poll had closed-ended questions with Likert scales to assess important variables including ease of use, accuracy, efficiency, and overall satisfaction. The survey was administered to 50 participants, consisting of 35 athletes and 15 coaches, who were purposively selected. The survey data was statistically analysed for patterns, trends, and correlations among the variables of interest.

Ease of Use
1. The application is easy to navigate and understand.
2. The interface of the application is user-friendly.
3. I did not encounter technical difficulties while using the application.
4. The application requires minimal effort to operate during a match.
5. Instructions for using the application are clear and straightforward.
Accuracy
6. The application records scores accurately without errors.
7. The statistical analysis provided by the application is reliable.
8. The application minimizes human errors in scoring compared to manual methods.
9. I trust the data generated by the application during matches.
10. The application provides real-time and precise updates on match statistics.
Efficiency
11. Using the application saves time compared to traditional scoring methods.
12. The application enhances the overall efficiency of managing petanque matches.
13. The application facilitates faster decision-making during matches.
14. The application simplifies the process of accessing past match statistics.
15. The application improves the overall flow of matches by reducing administrative delays.
Overall Satisfaction
16. I am satisfied with the application's performance during matches.
17. The application meets my expectations for a digital scoring tool.
18. I would recommend this application to other players and coaches.
19. The application adds value to my experience in playing or coaching petanque.
20. I believe the application is a beneficial tool for the development of petanque as a sport.

3. RESULTS

Participant Demographics

The survey had 50 participants, consisting of 35 players (70%) and 15 coaches (30%). Among the participants, 68% possessed more than two years of experience in petanque, whilst the remaining 32% had less than two years. Most participants (80%) had moderate-to-high proficiency in using Android applications.

In Table 2, most respondents have a junior high school education level (SMP), while only a few continue to higher education. This indicates that the level of education in Buleleng District is still relatively low, where many people prefer to work directly to help the family economy rather than continue their education. The level of education of these respondents will provide an overview of the influence of education on the number of children born alive and on the use of contraceptives in Buleleng District.

Descriptive Statistics

Table 1 presents the mean scores and standard deviations for each dimension (Ease of Use, Accuracy, Efficiency, and Overall Satisfaction) based on responses to the 20 survey items. The responses were rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

Dimension	Mean	Standard Deviation (SD)
Ease of Use	4.35	0.62
Accuracy	4.21	0.67
Efficiency	4.28	0.59
Overall Satisfaction	4.40	0.58

The results indicate that participants rated the application highly across all dimensions, with Overall Satisfaction receiving the highest average score ($M = 4.40$, $SD = 0.58$).

Inferential Statistics

To examine whether there were significant differences in perceptions between players and coaches, an independent-samples t-test was conducted for each dimension.

Dimension	Mean (Players)	SD (Players)	Mean (Coaches)	SD (Coaches)	t-value	p-value
Ease of Use	4.30	0.65	4.47	0.54	-1.04	0.303
Accuracy	4.18	0.68	4.27	0.65	-0.46	0.646
Efficiency	4.22	0.63	4.43	0.50	-1.12	0.268
Overall Satisfaction	4.37	0.59	4.47	0.55	-0.58	0.563

The analysis revealed no significant differences in the perception of ease of use, accuracy, efficiency, and overall satisfaction between players and coaches regarding the Android-based application for scoring and statistics. For ease of use, both players ($M = 4.30$, $SD = 0.65$) and coaches ($M = 4.47$, $SD = 0.54$) rated the application highly, with no significant difference observed, $t(48) = -1.04$, $p = 0.303$. Similarly, in terms of accuracy, players ($M = 4.18$, $SD = 0.68$) and coaches ($M = 4.27$, $SD = 0.65$) provided comparable ratings, indicating a shared trust in the application's ability to record scores and statistics reliably, $t(48) = -0.46$, $p = 0.646$. The data indicate that both groups perceived the application as user-friendly and effective in reducing errors during matches.

When examining efficiency, players ($M = 4.22$, $SD = 0.63$) and coaches ($M = 4.43$, $SD = 0.50$) also demonstrated similar perceptions, with no statistically significant differences, $t(48) = -1.12$, $p = 0.268$. Finally, total satisfaction ratings were comparably elevated for players ($M = 4.37$, $SD = 0.59$) and coaches ($M = 4.47$, $SD = 0.55$), thus substantiating the widespread endorsement of the application among both cohorts, $t(48) = -0.58$, $p = 0.563$. These results collectively underscore the extensive appeal and efficacy of the digital solution among key user demographics, affirming its potential as a significant resource for modernizing petanque match administration.

A Pearson correlation analysis was performed to investigate the links among the dimensions. All dimensions exhibited positive and significant connections. The most significant association was observed between Ease of Use and Overall Satisfaction ($r = 0.82$, $p < 0.001$), suggesting that user-friendliness profoundly impacted satisfaction.

4. DISCUSSION

The findings of this study underscore the wide acceptance of Android-based scoring and analysis apps among petanque players and coaches. Both groups evaluated the app favourably in all aspects of usability, accuracy, efficiency, and overall satisfaction with no statistically significant differences between them. The uniformity in perception indicates that the programme was created to meet the requirements and anticipations of various user demographics, making it an efficient instrument to improve petanque match management.

The app is highly regarded for its ease of use, with players and coaches recognising its user-friendly design (Fauzi, 2020). These results underscore the need for intuitive design in technology adoption, especially in sports environments where users often have different levels of technological proficiency (Hidayah et al., 2024). By facilitating an intuitive interface, the programme reduces barriers to its adoption and allows users to concentrate on their capabilities (Aripradono, 2021). This is in line with previous research that highlights the importance of simplicity and usability in driving acceptance of digital innovations in sport.

Accuracy is another aspect that received favourable ratings from both groups, signalling a shared confidence in the dependability of these applications. The eradication of human error in judgement, along with the capacity to generate accurate real-time statistics, may be significant factors influencing this favourable opinion (Liu, 2022). This provides considerable benefits over conventional manual techniques, which are prone to inaccuracies and inefficiencies (Vleugels et al., 2022). Confidence in the app's accuracy not only improves match equality, but also empowers coaches and players to make more informed decisions during and after matches.

The app's efficacy was also praised for its optimisation of scoring procedures and data analysis. Both athletes and coaches recognised the benefits in terms of time efficiency and ease of retrieving historical data for performance evaluation. These benefits are in line with the overarching trend in digital transformation, where increased efficiency is often a key driver for the adoption of new technologies (Zhang & Zhao, 2023). The programme enhances the user experience and facilitates the strategic development of athletes by easing administrative tasks and offering immediate feedback (Shibkova et al., 2020).

Ultimately, the overall high level of enjoyment expressed by both groups highlights the importance of this application to the petanque community. The integration of intuitive design, reliable precision, and enhanced efficiency certainly facilitated this favourable reaction. The results demonstrate the app's capacity to improve the administration of petanque matches and promote more participation in this sport (Wang & Liu, 2022). Nonetheless, despite the good results, there are still opportunities for improvement, including the resolution of device compatibility issues and the integration of user feedback to further optimise the app's functionality (Ismatullaev & Kim, 2024). This initiative will guarantee that the app will continue to evolve to meet user needs and maintain its significance in the digitalisation of petanque.

CONCLUSION

This study illustrates the wide acceptance and efficacy of an Android-based scoring and analysis application among petanque players and instructors. The results show uniformly improved scores across important characteristics, such as usability, accuracy, efficiency, and overall happiness, with no notable differences between the two user groups. These results underscore the application's capacity to modernise the sport of petanque by alleviating prevalent concerns associated with manual scoring techniques, including human error and inefficiency. The favourable opinion of the programme highlights its significance as an important instrument for real-time data collection, improving match management, and aiding strategic decision-making for players and coaches.

This research highlights the importance of user-centred design in facilitating the acceptance of digital advancements in specialised sports such as petanque. The app fulfils the requirements of its target users by developing a tool that is intuitive, reliable and efficient, and in keeping with the overarching trend in digital transformation in the sports sector. The research validates the practicality of the app and outlines a path for future development, highlighting the need to overcome difficulties such as improving device compatibility and integrating advanced functionality. The results of this study form the basis for further investigations into digital solutions in other emerging sports.

LIMITATION

This study provides significant data, but also has some limitations. The sample size was small, only 50 participants, which may limit the generalization of the results. A larger

sample, with a broader spectrum of players and coaches from other regions, could provide more vastness perspectives on effectiveness of the application. The study also relied on self-reported data, which may be prone to biases, such as overestimation of satisfaction and under-reporting of difficulty.

Another weakness is the brevity of the study, which focused on the initial perception of implementation. The study did not address the long-term user experience, including ongoing engagement, adaptability to change and its effect on performance and overall training outcomes. Future research could provide a longitudinal study to investigate the effect of prolonged use on user happiness and its role in player and coach development. Mitigating these limitations will strengthen the validity and lead to comprehensive evaluation of the app's influence on the petanque sport.

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