



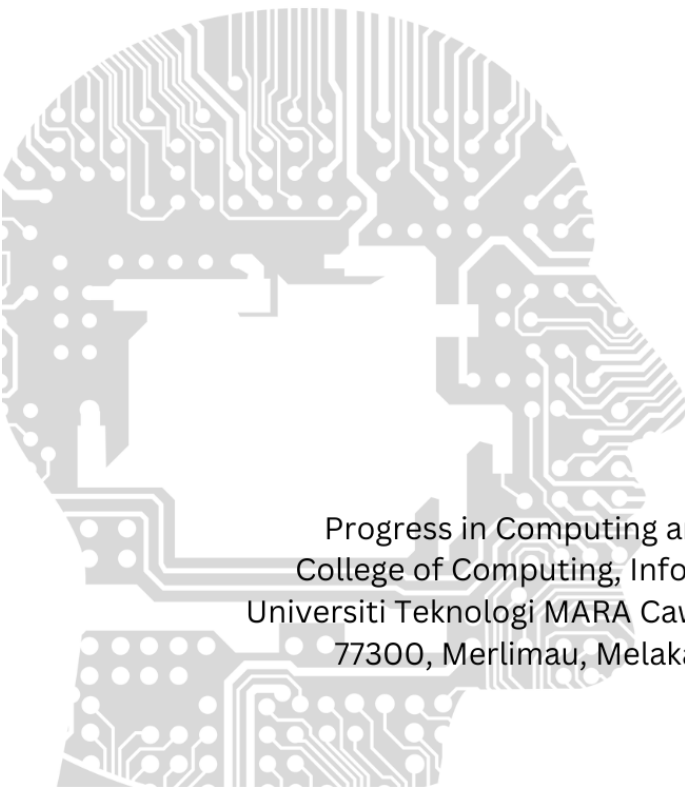
Cawangan Melaka

PCMJ

Progress in Computing and Mathematics Journal

volume 1

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Progress in Computing and Mathematics Journal
College of Computing, Informatics, and Mathematics
Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin
77300, Merlimau, Melaka Bandaraya Bersejarah

PCMJ

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volume 1



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PREFACE

Welcome to the inaugural volume of the **Progress in Computing and Mathematics Journal (PCMJ)**, a publication proudly presented by the College of Computing, Informatics, and Mathematics at UiTM Cawangan Melaka.

This journal represents a significant step in our commitment to fostering a vibrant research culture, initially providing a crucial platform for our undergraduate students to showcase their intellectual curiosity, dedication to scholarly pursuit, and potential to contribute to the broader academic discourse in the fields of computing and mathematics. However, we envision PCMJ evolving into a beacon for researchers both nationally and internationally. We aspire to cultivate a space where groundbreaking research and innovative ideas converge, fostering collaboration and intellectual exchange among established scholars and emerging talents alike.

The manuscripts featured in this first volume, predominantly authored by our undergraduate students, are a testament to the hard work and dedication of these budding researchers, as well as the guidance and support provided by their faculty mentors. They cover a diverse range of topics, reflecting the breadth and depth of research interests within our college, and set the stage for the high-quality scholarship we aim to attract in future volumes.

As editors, we are honored to have played a role in bringing this journal to fruition. We extend our sincere gratitude to all the authors, reviewers, and members of the editorial board for their invaluable contributions. We also acknowledge the unwavering support of the college administration in making this initiative possible.

We hope that PCMJ will inspire future generations of students and researchers to embrace research and innovation, to push the boundaries of knowledge, and to make their mark on the world of computing and mathematics.

Editors

Progress in Computing and Mathematics Journal (PCMJ)
College of Computing, Informatics, and Mathematics
UiTM Cawangan Melaka

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SPORT FACILITIES FINDER USING GEOLOCATION (SportNow)

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Article Info

Abstract

The Sport Facilities Finder project addresses the challenge faced by individuals in discovering suitable sports facilities in unfamiliar locations. With a focus on user preferences and geolocation, the mobile application leverages the Android platform and Flutter framework to offer a seamless and visually appealing cross-platform solution. The backend, powered by Firebase, ensures real-time data synchronization and secure user authentication. Users can effortlessly locate nearby sports facilities, customize searches based on preferences, and access comprehensive details, including pricing, amenities, and user reviews. The incorporation of in-app advertisements serves as a revenue generation strategy, while the application's success is underscored by positive user feedback, highlighting its ease of use, accuracy, and convenience. This project not only introduces a novel approach to facility discovery but also demonstrates the efficacy of integrating geolocation and user preferences for an enhanced user experience in the realm of sports facility finding.

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INTRODUCTION (HEADING 1)

A sport facilities finder is a tool or operation that allows individuals to search and detect sport facilities in their area. It's generally an online platform or mobile operation that provides a comprehensive list of sport facilities available, along with details similar as position, hours of operation, freights, and amenities offered. (Jones, R. E. A., & Heath, G. W. (2016)) users can search for specific types of sport facilities, similar as gymnasiums , swimming pools, tennis courts, or running tracks, and filter the results based on their preferences. They can also use the sport facilities finder to bespeak facilities, register for fitness classes, and make payments online. sport facilities finder platforms are salutary for individualities who are new to an area, traveling, or looking for new sports and fitness openings. It helps them to save time and trouble in searching for the right installation and allows them to compare and elect the stylish option grounded on their requirements and preferences. In addition, sport facilities finder platforms also profit from the sport facilities themselves, as they help to increase their visibility and attract new guests. It can also help to ameliorate the overall health and fitness of the community by encouraging further people to engage in physical exertion.

LITERATURE REVIEW (HEADING 1)

Sports facilities are integral to promoting physical activity and inclusivity by providing accessible spaces, equipment, and safety measures (Asefi & Ghanbarpour Nosrati, 2020). They serve as community hubs, fostering social interaction, and offer health benefits. Additionally, sports facilities play a crucial role in skill development, talent identification, and engaging youth for a healthy lifestyle (Markvirer & Sakhipova, 2022). In the realm of mobile applications for fitness, the focus is on designing personalized apps using recorded fitness and smartphone data (Claudinus et al., 2020). These apps track progress, analyze patterns, and leverage GPS and other metrics for accurate recommendations. The integration of machine learning enhances continuous improvement, aiming to enhance users' fitness journeys and overall well-being. However, the importance of user privacy, data security, and transparent communication about data practices are emphasized to build trust. Together sports facilities and fitness applications contribute to creating an environment that encourages an active and healthy society (Besoin & Gallardo, 2023).

Geolocation, a powerful capability of smartphones, has become a focal point in both native and web application development(Steiner et al., 2019). The introduction of the Geolocation API standardized access to location data on the web, allowing developers to create location-aware applications. This API enables web applications to request and access a user's geolocation data, providing latitude, longitude, and additional information for personalized experiences. The diverse applications of geolocation include navigation services, social networking, marketing, and various location-aware functionalities(Zhang et al., 2020).

However, the utilization of geolocation data requires careful consideration of user privacy and security, emphasizing transparency and user control over data access.

In the context of implementing geolocation functionality for the nearest location in an app, a systematic approach is outlined. This involves obtaining user permission, retrieving geolocation data using the appropriate API, and applying the Haversine formula for accurate distance calculations based on latitude and longitude(Atencio et al., 2020). The Haversine formula accounts for the Earth's curvature but may not consider factors like road networks or traffic conditions. The integration with a database containing attraction coordinates allows the app to recommend nearby attractions based on calculated distances. Throughout the implementation, user privacy and data security are paramount, requiring transparent communication, user consent, and secure handling of sensitive data. (Diyasa et al., 2022)

In conclusion, geolocation's significance in smartphone capabilities and web applications is underscored by the standardized Geolocation API (Hovorushchenko et al., 2021). The implementation of geolocation functionality in apps, including the use of the Haversine formula, enables personalized and contextually relevant experiences. However, diligent attention to user privacy and data security is essential throughout the development process to ensure a seamless and secure user experience (**Oubenaalla & IEEE Computational Intelligence Society, n.d.**).

Mobile application development is a multifaceted and dynamic process that encompasses various stages, starting from the conception of ideas and identification of the target audience to planning, development, testing, and ultimately deployment. This intricate journey aims to deliver user-friendly and innovative applications tailored for mobile devices like smartphones and tablets (PETERSEN & PHILANDER, 2022). The initial phases involve generating creative ideas, understanding the needs of the target audience, and meticulous planning, where the app's functionality, features, and design are carefully outlined. Following this, user experience (UX) and user interface (UI) design come into play, focusing on creating visually appealing and interactive elements to ensure an intuitive and engaging user experience (Abdul Rahman et al., 2021). This includes wireframing, prototyping, and designing visual elements that align with the app's branding and purpose.

Moving forward, the development phase requires coding using platform-specific programming languages such as Swift or Objective-C for iOS and Java or Kotlin for Android (Nascimento et al., 2022). Developers use integrated development environments (IDEs) like Xcode or Android Studio, and APIs (Application Programming Interfaces) are integrated to enable communication with external services and resources, such as social media platforms or location services. Once the development is complete, rigorous testing is conducted to identify and rectify any bugs or issues, covering functional, compatibility, and performance testing.

Upon successful testing, the app is ready for deployment, a process that involves preparing the app for submission to app stores like the Apple App Store or Google Play Store, adhering to platform guidelines and requirements (Bharati Vidyapeeth University (New Delhi et al., n.d.)). Post-deployment, the journey continues with ongoing maintenance, updates, and bug fixes to ensure the app remains functional, secure, and compatible with new operating system versions and device updates. Monitoring user feedback, analyzing app performance, and incorporating new features based on user needs are integral components for the long-term success of the app.

Beyond the development process, various types of mobile applications cater to different user needs. Native apps, specifically designed for a particular platform, provide optimal performance and user experience but require separate coding for each platform. Web apps, accessible through web browsers on mobile devices, are cross-platform compatible but may have limited access to device features(KAZZAZ & RYCHLY, 2017). Hybrid apps combine elements of both native and web apps, offering a balance between performance and cross-platform compatibility(El-Kaliouby et al., 2021).

The current trends in mobile applications are shaped by technological advancements and evolving user demands. Integration of 5G technology facilitates faster data transfer and low latency, while augmented and virtual reality enhance immersive experiences in gaming, education, and marketing(Alwis et al., 2021). Mobile apps play a central role in connecting and monitoring Internet of Things (IoT) devices, incorporating artificial intelligence (AI) and machine learning (ML) for personalized experiences and predictive analytics. Additionally, trends include the rise of mobile wallets, Progressive Web Apps (PWAs), and a strong emphasis on privacy and security measures, reflecting the dynamic nature of the mobile app landscape as it responds to emerging technologies and evolving user expectations(Padma et al., 2023).

METHODOLOGY (HEADING 1)

The Software Development Life Cycle (SDLC) serves as the guiding framework in software engineering, encompassing various phases from inception to deployment and maintenance. Diverse SDLC models, each with unique characteristics, facilitate this process. The waterfall model, a sequential approach, involves completing each phase before progressing to the next, encompassing requirements gathering, design, implementation, testing, deployment, and maintenance. Although it provides structure, the waterfall model lacks flexibility for accommodating changes during development.

In contrast, the Agile model emphasizes iterative and incremental development, fostering collaboration between developers, stakeholders, and customers. Agile methodologies like Scrum and Kanban enhance adaptability and flexibility. The spiral model combines elements of both waterfall and iterative development, managing potential risks through iterative cycles. The iterative model delivers software in small increments, enabling early functional product delivery and feedback-driven adjustments (Alzeyani & Szabo, 2022). The V-model, a variant of the waterfall model, emphasizes testing at each phase, ensuring thorough validation of requirements.

Choosing an SDLC model depends on project requirements, team capabilities, customer needs, and time constraints. Staying updated with evolving SDLC models is crucial in the software industry to effectively meet customer requirements. The SDLC typically comprises phases such as requirements gathering, system analysis, system design, coding/implementation, testing, deployment, and maintenance. These phases may vary based on the selected SDLC model (Saravanan et al., 2020).

The Waterfall model, an early and widely used methodology, follows a sequential approach with fixed phases (Alzeyani & Szabo, 2022). Challenges arose when changes were needed, necessitating a return to earlier phases and causing inefficiencies. Alternative methodologies, particularly Agile approaches, like Scrum and Kanban, addressed these limitations by promoting flexibility and adaptability. Despite its drawbacks, the Waterfall model finds applications in contexts with well-defined and stable requirements, smaller project scopes, or regulatory compliance needs. Overall, Agile methodologies have emerged as more agile and flexible alternatives, enabling effective responses to changes and improved software delivery. Testing is a critical aspect of application development, ensuring software quality and reliability through systematic evaluation. Key steps include test planning, execution, and comparison of expected and actual results, employing both manual and automated testing techniques. The goal is to meet requirements, ensure proper functionality, and deliver a positive user experience.

User Acceptance Testing (UAT) is vital for the sport facilities finder project, involving real users to validate functionality, usability, and effectiveness. The process includes planning, defining scope and objectives, preparing the test environment, developing test cases, executing tests with selected users, collecting feedback, addressing issues, and obtaining formal sign-off for deployment.

Functionality testing focuses on verifying functional requirements and features, ensuring the application performs as intended. It covers input/output operations, data manipulation, system integration, and user interactions. This testing aims to validate correct functionality, identify defects, and contribute to overall quality and reliability.

Documentation is an integral part of application development, creating user manuals, technical specifications, design documents, and system documentation. These documents serve as references for stakeholders, ensuring clear communication, facilitating knowledge transfer, and aiding in maintenance and future enhancements. Documentation provides insights into the application's architecture, features, functionality, and usage, benefiting both the development team and end-users.

RESULT AND DISCUSSION (HEADING 1)

The Sport Facilities Finder project distinguishes itself in the domain of sports facility discovery through its innovative use of technology and a strong focus on user needs. At its core, the project leverages the seamless integration of user preferences with geolocation technology, enabled by the robust combination of the Android platform and the Flutter framework. This approach ensures a consistent and visually appealing experience across different devices, marking the application as a pioneer in user-centric sports solutions.

A key strength of the application is its user-centric design, which offers a personalized and intuitive experience by allowing users to tailor searches to their preferences. The cross-platform accessibility provided by Flutter, coupled with real-time data updates from Firebase, ensures that users receive the most current information on sports facilities, enhancing reliability and user satisfaction. Positive feedback from users further attests to the application's success, highlighting its usability and accuracy. The strategic inclusion of in-app advertisements demonstrates a thoughtful approach to monetization, balancing revenue generation with a positive user experience.

However, the application faces limitations, including a dependency on internet connectivity, which could hinder access in areas with poor network coverage. The potential for in-app advertisements to negatively impact the user experience also presents a challenge, emphasizing the need for careful implementation.

To address these limitations and enhance the application further, recommendations include improving the offline mode to ensure accessibility in areas with limited internet connectivity, optimizing the ad experience to maintain user satisfaction, and exploring augmented reality features to offer immersive facility previews. Additionally, incorporating community-building features could foster user engagement and enrich the overall user experience.

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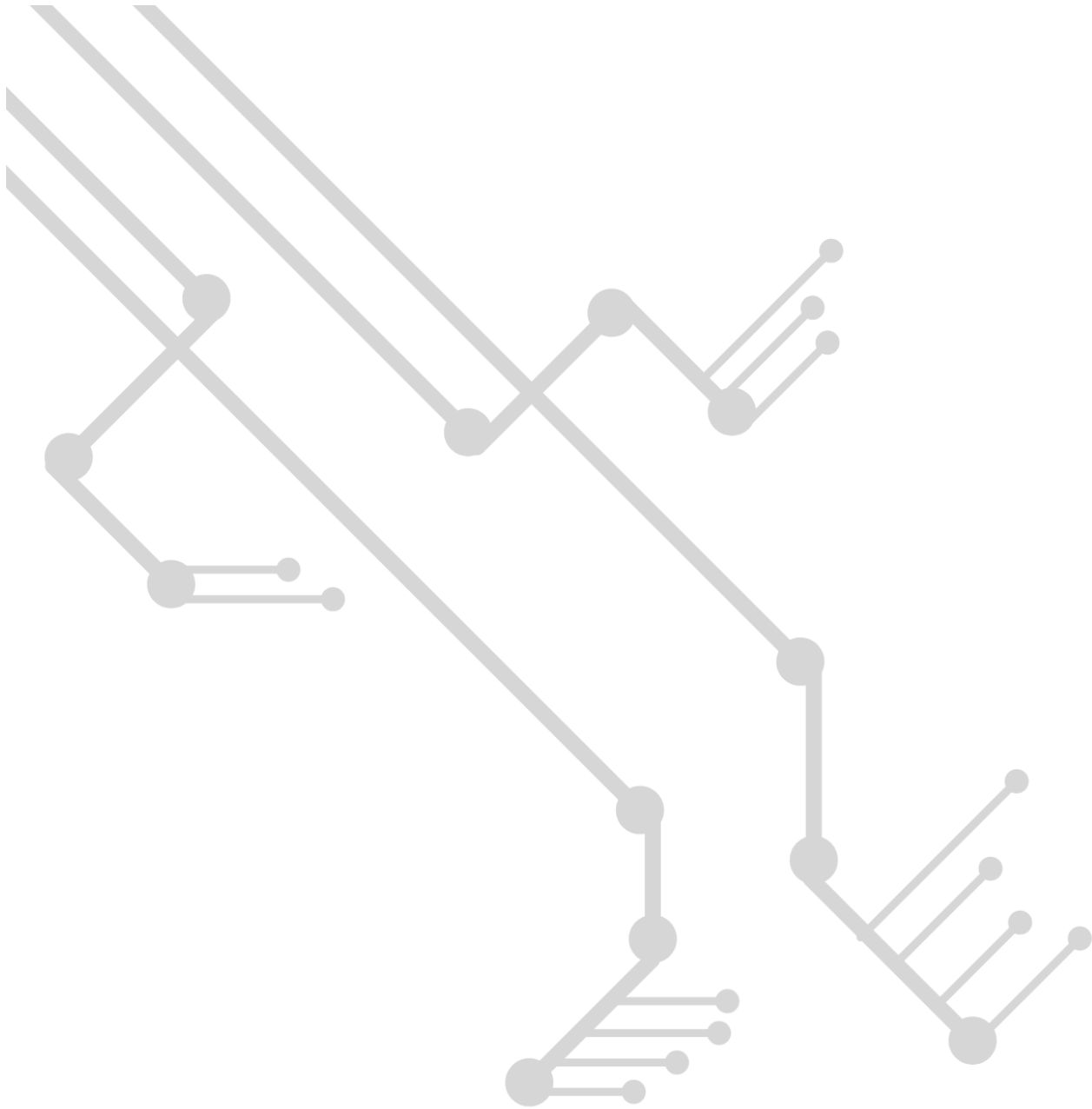
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