

International School

**Capstone Project 2**

CMU-SE 451

**Project Proposal**

**Version 1.0**

**Date: September 6, 2024**

**PoolAuto - Online Billiards Booking**

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**Approval of Mentor:**

Name Signature Date

#### **PROJECT INFORMATION**

|  |  |  |  |
| --- | --- | --- | --- |
| **Project acronym** | **Pool Auto** | | |
| **Project Title** | Online Billiards Booking | | |
| **Start Date** | 6 Sep 2024 | **End Date** | 15 Dec 2024 |
| **Lead Institution** | International School, Duy Tan University | | |
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| **Project Web URL** |  | | |
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**REVISION HISTORY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version** | **Date** | **Comments** | **Author** | **Approval** |
| 1.0 | 06/09/2024 | Initial Document | Tien Le Van |  |

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# **1. Project Title**

**PoolAuto -** Online Billiards Booking.

# **2. Project Overview**

PoolAuto is a mobile app designed to make it easy for users to find and book tables in pool bars anywhere. The app provides detailed information about pool bars, including addresses, number of tables available, prices, and reviews from users. PoolAuto aims to create a convenient, fast, and efficient experience for pool lovers, helping them save time and have the best experience.

The primary goal of PoolAuto is to help users find and book pool tables through suggestions. By locating the user's location, the app will display pool bars near their location, allowing users to select and book tables quickly. This makes it easy for users to access billiards bars without spending a lot of time searching.

# **3. Project Background and Motivation**

With busy lifestyles, many people find it difficult to find and book pool tables while balancing their daily routines. They often lack the time to search for suitable pool bars or check out detailed information about them. Furthermore, personal preferences and specific location requirements add to the complexity of finding an ideal pool venue.

PoolAuto was developed to meet the growing demand for a convenient and quick solution for finding and booking pool tables. The app aims to simplify the search process by allowing users to locate their location and get suggestions for the nearest pool bars. Users can easily select and book tables quickly.

# **4. Proposed Solution**

The proposed solution is **PoolAuto**, a mobile app designed to help users find and book pool tables based on their location and preferences. PoolAuto simplifies the process of locating and reserving tables by providing detailed information about nearby pool bars. The app ensures a convenient and efficient experience by offering personalized suggestions, allowing users to quickly select and book tables without spending excessive time searching.

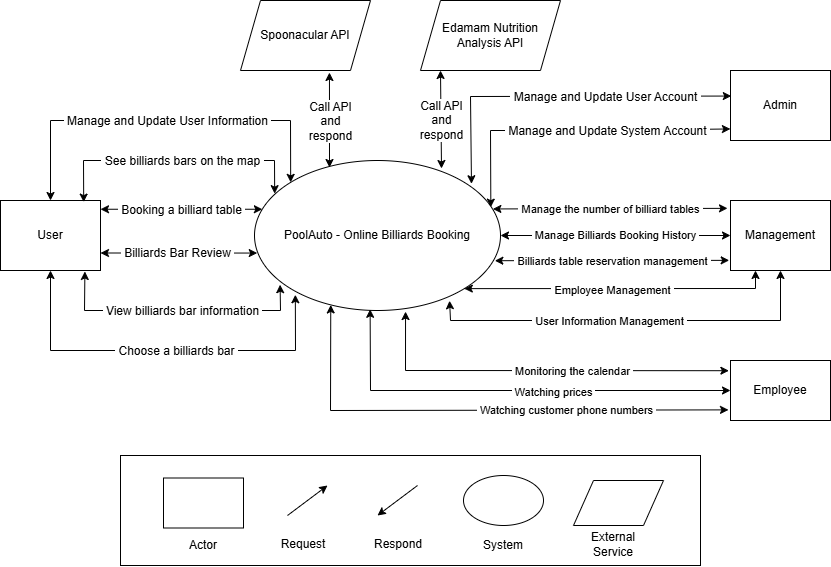
**Core Features and Functionalities:**

1. **Location-based pool search:**
   * Users provides their location or allows the app to auto-identify it, from which the app will display a list of nearby pool bars.
2. **Billiards bar details:**
   * Each billiards bar will include details such as the number of available tables, prices, addresses, and reviews from other users.
3. **Track table availability:**
   * Users will be able to monitor table availability in real-time, making it easy for them to make decisions and book tables without having to come in person.
4. **Advance table reservation and online deposit:**
   * Users can reserve a table in advance through the app and pay an online deposit to ensure that the table is kept, avoiding running out of tables upon arrival.
5. **Booking history and reviews:**
   * Users can review their booking history, review the restaurant, and share their experience with the community of other users. This also helps improve the app's personalized recommendations.

**Technologies and Approach:**

* **Frontend**: The app will be built using **React Native** to ensure it is cross-platform (iOS and Android), offering a seamless and intuitive user interface.
* **Backend**: **Spring Boot** will handle the server-side logic, while **MySQL** will store user data, recipe information, and nutritional content.
* **Nutritional Database**: The app will integrate with APIs such as **Edamam** or **Nutritionix** to retrieve accurate nutritional information for ingredients and recipes.
* **Algorithm for Recipe Matching**: An ingredient-matching algorithm will be developed to recommend recipes based on the user's input, utilizing **basic matching techniques** or **machine learning** for more advanced personalization.
* **Personalization Engine**: A user profile system will be built to tailor meal recommendations based on individual health data and goals. This will allow the app to suggest meals that meet specific caloric and nutritional requirements.

**System Context Diagram:**

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# **Objectives and Deliverables**

**Objectives:**

* **Objective 1**: Develop a fully functional mobile app interface that allows users to search for billiard bars, view available tables, and book reservations.
* **Objective 2**: Implement a feature that provides real-time updates on the number of available tables and pricing at different billiard bars.
* **Objective 3**: Create a user profile system that personalizes recommendations for billiard bars based on user preferences and location.
* **Objective 4**: Implement a feature that tracks and displays user booking history and preferences to enhance the booking experience.
* **Objective 5**: Ensure cross-platform functionality for iOS and Android devices.

**Deliverables:**

* **Deliverable 1**: A mobile application that allows users to search for billiard bars, view available tables, and make reservations with real-time updates on table availability and pricing.
* **Deliverable 2**: A backend system that stores user profiles and preferences, providing personalized recommendations for billiard bars based on user data and location.
* **Deliverable 3**: A booking tracking feature that enables users to view and manage their booking history and preferences.
* **Deliverable 4**: Full cross-platform availability on both iOS and Android, with a user-friendly interface for seamless navigation and booking experience.

# **6. Methodology and Tools**

**Project Management Approach**

* Agile Methodology: We will adopt an agile development methodology, using sprints to deliver features iteratively and gather feedback continuously. This ensures flexibility and responsiveness to changing needs, while promoting transparency and collaboration.

**Development Methodology**

* Scrum Framework: We will implement the Scrum framework within the agile approach, with defined roles (Product Owner, Scrum Master, Development Team) and events (Sprint Planning, Daily Scrum, Sprint Review, Retrospective). This provides a structured and efficient workflow.

**Technical Stack**

* + Programming language: Javascript, HTML, CSS, Java.
  + Framework: React, React-Native, Spring Boot, Bootstrap.
  + Database: MySQL
  + Database Management System: MySQL Workbench.
  + Develop tools: Visual Studio Code, Intellij.
  + Version Control System: Github.
  + Project Management: Trello.

# **7. Timeline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Task Name** | **Duration (days)** | **Start Date** | **End Date** |
| 1 | Initial | 9 | 03/09/2024 | 11/09/2024 |
| 2 | Development | 89 | 12/09/2024 | 09/12/2024 |
| 3 | Close | 6 | 10/12/2024 | 15/12/2024 |
|  | Duration | 104 | 03/09/2024 | 15/12/2024 |

*Table 1: Project Timeline*

# **8. Project Team**

**8.1. Information team member**

|  |  |  |  |
| --- | --- | --- | --- |
| **Full Name** | **Phone** | **Email** | **Position** |
| Dung, Nguyen Dang | 0815706195 | nguyendangdung240804@gmail.com | **Scrum Master** |
| Cong, Dinh Minh | 0969258866 | dongminhcinh@gmail.com | **Product Owner** |
| Huy, Ta Hoang | 0902327458 | huyta152@gmail.com | Developer |
| Nghia, Nguyen Duy | 0965008659 | Kingwinlata@gmail.com | Developer |
| Khoa, Mai Phuoc | 0903532097 | phuockhoamai@gmail.com | Developer |

# **8.2. Layer Diagram**

A diagram of a product owner

Description automatically generated

# **9. Risk Management**

* **Risk 1**: Difficulty in integrating with third-party APIs for nutritional data (e.g., Edamam, Nutritionix) may delay development.
  + **Mitigation**: Start researching and testing third-party APIs early in the project timeline. Prepare backup API options and allocate buffer time for integration and testing.
* **Risk 2**: Designing a personalized algorithm for meal suggestions may be complex and take longer than expected.
  + **Mitigation**: Break the algorithm development into smaller, manageable tasks. Develop a basic version first and then enhance it gradually. Schedule extra time for testing and refining.
* **Risk 3**: Time constraints may affect the thorough testing of the app on multiple platforms (iOS and Android).
  + **Mitigation**: Conduct parallel testing during the development process, leveraging automated testing tools for cross-platform compatibility. Allocate additional time for beta testing.
* **Risk 4**: Budget limitations may restrict access to certain APIs or tools needed for nutritional analysis or recipe databases.
  + **Mitigation**: Prioritize essential features and identify free or lower-cost alternatives. Consider using open-source resources where possible and keep the scope realistic.
* **Risk 5**: Unexpected changes in user requirements or feedback might require modifications to the app, extending development time.
  + **Mitigation**: Set up clear communication channels with stakeholders and define the project scope early. Schedule frequent check-ins to gather feedback and adjust the plan if necessary.

# **10. Budget and Resources**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NO** | **Criteria** | **Prices (USD)** | **Amountours(Hours)** | **Tota(USD)** |
| 1 | Working hour | $2/hour | 3328 | **$4992** |
| **Total cost** | | | | **$4992** |

*Table 2: Total Cost Estimation*

|  |  |  |
| --- | --- | --- |
| **Description** | **Amount** | **Unit** |
| Number of members | 4 | Person |
| Number of working hours per day | 6 | Hour |
| The cost of working per hour per person | 2 | USD |
| The duration of the project | 3 | Month |
| The number of working day | **104** | **Day** |

*Table 3: Description Cost*

**Explain:**

* Amount of working hours = 5 members \* 6 hours/day \* 104 days = 3120 hours
* Cost of working hour: 3120 hours \* $2/hours = $6240

# **11. Project constraints**

|  |  |  |
| --- | --- | --- |
| **Constraint** | **Constraints Description** | **Guidelines for Acceptance** |
| **Economic** | The total cost of the project cannot exceed $6240. | Elements for consideration are design costs, production costs, maintenance costs, operating costs, and sales price |
| **Environmental** | The final product should ensure consistent performance across iOS and Android devices while minimizing battery usage through optimized app processes. | The impact of the design on the environment as well as the impact of the environment (e.g. temperature range, humidity, vibration, electromagnetic interference immunity, and shock) on the design should be considered. Design for recycling and design to use recycled materials should also be considered |
| **Ethical** | N/A | Ethical considerations can be broad. Areas that are typically addressed include intellectual property, reverse-engineering, privacy, security, and the conflict between cost and safety |
| **Public health, safety, and welfare** | N/A | Includes safety standards as well as the impact of the design on users (for example, electrical or physical hazards) |
| **Social and Global** | The product will reduce the time and efforts of tasks related to class management, attendance, and multiple-choice exam grading. | Addresses aspects such as benefits, risks, the man-machine interface, the acceptance of products by the intended user or by society at large, and global and socially responsible engineering. |
| **Cultural** | N/A | Which cultural characteristics could influence the approach?  How do the design from different cultures differ? |
| **Sustainability** | The product will need to be maintained and upgraded in the future. This includes providing software updates, bug fixes, and feature improvements. | Refers to the sustainability of resources, including material, energy, supplies, manufacturing techniques, personnel, operation, and the need for additional infrastructure, as well as the sustainability of the design including reliability, lifetime, durability, reusability, maintainability. |

# **12. Conclusion**

PoolAuto has the potential to make a significant impact in the realm of finding and booking billiard tables by offering a comprehensive, user-friendly solution. The app allows users to easily search for billiard bars, check the number of available tables, view prices, and book tables directly based on real-time information. By integrating features that analyze user needs and optimize the booking experience, PoolAuto addresses the growing demand for digitized entertainment services. This project contributes to the field of Software Engineering by developing a mobile app with features that combine real-time data processing and user-centric design. Focused on saving time for players and optimizing the use of billiard tables, the project also demonstrates how innovative software solutions can enhance entertainment experiences and improve business efficiency in the industry.

# **13. References**

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*[2] General Software Coding Standards and Guidelines* [*https://www.nws.noaa.gov/oh/hrl/developers\_docs/General\_Software\_Standards.pdf*](https://www.nws.noaa.gov/oh/hrl/developers_docs/General_Software_Standards.pdf)

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*[7] IEEE:* [*https://www.ieee.org/*](https://www.ieee.org/)