Project Phase 0

Requirement Elicitation

Badminton Court Booking App

A Report Submitted in Partial Fulfillment of
the Requirements for

ITCS371 Introduction to Software Engineering

By

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Business description

Badminton Court Booking App (codename: ShuttleCourt), is an innovative application design to make the process of booking badminton courts more convenient and enjoyable.

Our main mission is to integrate badminton courts with mobile technology by removing humans from the process. The automation of badminton court bookings would increase the use of the court by reducing downtimes and conflict. Resulting in decreased operational costs for the owner and less work for the staff.

In addition to the benefits mentioned above, The Badminton Court Booking Application will also provide users by making the booking process more accessible by granting the user greater control over their bookings, allowing the user to check whether the court is available, make reservations at their preferred times, and cancel the schedule if necessary.

In conclusion, our mission is to optimize the process of badminton courts reservation to be more effective and user-friendly for both users and the staff.

Project description

Key feature of ShuttleCourt will include:

1. **Badminton court management:**

   The badminton court staff team (Administrator) is the crucial group of people for our Badminton Court Booking Application and ShuttleCourt Badminton court management allows the process of managing badminton courts more efficiently. The duties of the staff team include listing and updating the courts information such as location, open and close time, and their status.

2. **User management:**

   Here is an overview of ShuttleCourt user management system. First users must first sign up by providing their name, address, and payment card details (if they want to pay by credit card). After that, They will become a member of the application. They will also have to be able to login or logout to switch the booker. The member (logged in user) will be allowed to do various action such as searching, add booking, or removing booking

3. **Badminton Court Searching**

   The application offers court searching to make the process of finding a badminton court more simple and practical. This application will also support advanced search using information such as name, price, and distance from the user's current location.

4. **Badminton Court Booking System**

   This is the main feature of the application, booking. When certain courts become available for use, members will be able to book the badminton court by providing time for the booking before paying the price. If the court is not available, members will also be allowed to add a reservation notification which will notify the user then court is available. The application will also allow users to cancel the booking. In addition, ShuttleCourt also features a badminton court review system for members.

5. **Payment Transaction system:**

   Transaction mechanism is used to confirm the user's intention during the booking process and reduce fraud. There are two payment options offered by ShuttleCourt, including banking transfer and credit card transaction. Members will receive a refund if they decide not to play on any court by canceling as mentioned above. To further safeguard the security of user payment information, we employ encryption methods. ShuttleCourt will also need to establish a connection with a banking database to allow them to make transactions.

6. **Ease of use:**

   ShuttleCourt is made with a fantastic user experience and accessibility in mind, with a modern UI and responsive design for the mobile applications.

7. **Data security:**

   ShuttleCourt places a high importance on data security and uses a state-of-the-art encryption method to store and send customer data securely. This ensures the safety of every personal information provided by the user.

Target customer

1. Casual badminton player (e.g. student, local people): Individual who plays badminton casually to exercise or pass time. They might switch to other sports and only play badminton from time to time. They likely be the main user of the application but will only use this occasionally.

2. Badminton athlete: Individual who needs a badminton court to practice and improve their skill and strength trying to win for the university or an organization. They will likely be the main booker in the application.

3. Organization or work group: The group of people that wants to book multiple courts for

their group needs, maybe for an ice-breaking activity or just for fun. They will rarely book the court but when they do, they will book a lot of courts.

Functional requirements

Badminton court management

R1: Administrators should be able to update the status of badminton courts such as broken courts, renovated, etc.

R2: Administrators should be able access all badminton courts information court including. location, business hours, booking cost, and court ruleset (e.g allowed shoes on the court).

User management

R3: The application must have a membership system to let members reserve a badminton court ,update their status, and select time to play.

R4: Administrators should be able to update the status of each user. For instance, users might have bad behavior, so staff of administrators should terminate that user account.

R5: Users should be able to register as a member, with information including name, address, and credit card information. (Note credit card information is optional for user input).

R6: The application should have a user authentication system (login, logout).

R7: Users must be able to edit their profile including updating personal information and changing password.

Badminton Court Searching system

R8: The application should include a search system where users can search for a badminton court based on the following query: name, distance of court from the user, and price of court booking.

Badminton Court Booking System

R9: Members must be able to see all available badminton courts in the application.

R10: Members must be able to select badminton courts based on location.

R11: Members must be able to book a badminton court on the application by selecting badminton that is available and does not have reserve time conflict.

R12: Members must be able to enter the time to reserve the badminton court.

R13: The system must have a reservation list of the court for recording users' bookings.

R14: Members must be able to cancel badminton court booking and get the refund.

R15: Notification system for unavailable badminton court. This system would alert users when the badminton court is available. It should also ask if the user wants to book a badminton court now or not.

R16: Equipment reservation system, users can reserve equipment in badminton courts during play times for example badminton rackets and shuttlecock.

R17: Users should be able to review badminton courts with stars rating or descriptions.

R18: Users should be able to see reviews of all the badminton courts.

Badminton Transaction System

R19: Users must be able to make transactions to the court via credit card or bank transfer.

R20: The system should have a connection with a banking system to handle credit card transactions and banking transfer.

Non-functional Requirements

User Interface

NR1: The user interface should look pretty and is easy to use.

NR2: After users register, they must be able to see the status of each court. (this kinda sound functional)

NR3: The search system should have an information retrieval system that can filter and return the list of courts based on what characters, or even just a part of the name that the user has typed into the search system.

NR4: Whenever there's a court available, the system should inform the user by notification to ask whether they would like to book the court or not.

Multi-language support

NR5: The application should support 3 languages as follow: Thai, English and Chinese.

System Performance

NR6**:** The application should be able to detect whenever there's an available court so that the user can request a court reservation to the application.

NR7: The application should be able to handle concurrency of approximately 1000 users.

NR8: The search system should respond to a user query within 2 seconds.

System Security

NR9: Users should use a secure password that is strong and hard to guess.

NR10: User data including name,address,credit information must be stored securely using encryption technique.

Identifying actors

1. **Members**
    - Can book a badminton court if there is a court available.
    - Can put badminton court on notification to alert them if it become available
    - Can make payment to the court.
    - Can select the time to start until the end for a session.
    - Can cancel their own reservation.
    - Can rent equipment from the court
    - Can check the status of the court.
    - Can see the rate and review of the court.
2. **Administrator / Staff**
    - Can manage the status of the court.
    - Can register the details of the badminton court.
    - Can update a customer's status.
3. **Badminton application system**
    - Can keep the information of the members.
    - Can contain the estimated amount of 1000 users at the same time.
    - Can maintain the search speed to not exceed more than 2 seconds.
    - Contain a good UI and Ux that are comfortable and easy to use.
    - Can display 3 different languages.

Bonus:

Additional Requirement Statements statements that involve the integration or utilization of cutting-edge technologies.

1. **Augmented Reality (AR) Court Visualization:**

   Utilize augmented reality (AR) technology to let users virtually tour badminton court locations, amenities, and conditions before making a reservation.

2. **IoT-Powered Court Monitoring:**

   To keep track of the status of badminton courts, including temperature, humidity, predicted weather, and equipment condition, Internet of Things (IoT) sensors could be installed in the badminton facility. This would grant users real-time access to the court's status, helping them make informed decisions when choosing a badminton court to play on.

3. **AI-Powered Court Suggestions:**

   Implement a recommendation engine powered by artificial intelligence (AI) that recommends the best venues based on user preferences, historical data, and current variables including player skill, weather, and venue availability.

4. **Navigation System (GPS):**

   The program can recommend transportation services to the user's chosen court and offer a real-time route or direction finder to help the user get there on time.