

UNIVERSITY OF WATERLOO

SE464

SECTION 001

Project Proposal (Revised)

Group 25

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Project Title: ShuttleQL (Shuttle Queueing Logistics)

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1 Introduction

1.1 Motivation

Around the world, there are 100s of recreational badminton clubs which host regular sessions at set locations for members to drop in and play at. Traditionally, the operation of a badminton club was done manually through the combined efforts of the clubs executive staff. There are several burdensome and repetitive tasks that the staff members need to do on a regular basis in order to keep the club running smoothly. For example,

- Registering new club members
- Checking in/out members during a club session
- Scheduling members into courts for each rotation

These tasks negatively impact the productivity of the staff and are prone to human error. In addition, there is no effective means for the club execs to communicate with the members in real-time. Finally, there is no easy way for a member to get feedback on their own performance unless they hire a coach or ask for critique from a staff member.

1.2 Idea

ShuttleQL is an all-in-one badminton club management platform which not only automates repetitive administrative tasks but also acts as a communication hub between the club executives and its members. It also offers insights and analytics into performance of the players in the club.

The platform will be entirely web-based. It will consist of two components: a club member mobile web based dashboard and an admin desktop web based dashboard. The platform from the club member's perspective will be a mobile web based app since they are more likely to have access to a phone than a laptop when they come to session. The admin dashboard will be desktop web based since it requires heavy user interaction which will be easier on a laptop rather than on a phone.

1.3 Originality

Although existing software solutions exist for a similar purpose, they are often incomplete relative to ShuttleQL and don't leverage many of today's technologies. ShuttleQL aims to fix most if not all of the pain points associated with managing a badminton club. It also applies new concepts such as data analytics and machine learning into processes such as matchmaking and coaching, which has not yet been done in existing solutions.

2 Project Properties

2.1 Functional

1. Registering new club members
2. Allowing users to check-in/check-out of a club session
3. Match making algorithm that allocates players to open badminton courts
4. Display current players that should be on each court
5. Allow executives to override the match making algorithm
6. (Bonus): Send notifications to users once they are able to play
7. (Bonus): Allow executives to broadcast announcements to users
8. (Bonus): Show the match history of each member
9. (Bonus): Track match-making-rating of club members in ladder matches

2.2 User Scenarios

There are two different types of users in our system. The first type of user is a badminton club executive. They have access to a variety of different admin-level actions such as player management, court management, and communication. For example, they can override the match making done by system. This will be useful in the scenario that a member is scheduled to play on a court but they have to leave early, so the executive can simply replace the member that's leaving with a new member that isn't playing.

The second type of user is the normal badminton club members. They would interact with our system by viewing on their phones the current players playing on each court. This reduces crowding between rotations if this information was displayed in on centralized location in real life. In addition, they get notifications when it's their turn to play. Using notifications eliminates the need for the member to constantly check whether they are playing or not.

2.3 Non-functional

The two mandatory non-functional properties that our system needs to support are dependability and portability. The other non-functional properties are bonuses.

2.3.1 Dependability

Dependability describes the reliability of the system. It also describes how accurate the software features meets the specifications. The system should behave exactly as the specifications describe without encountering any software bugs. This property is important because our system needs to be reliable for every badminton club session. It is crucial that every user has correct matches in order to have good user experience.

Requirement: The system must have an uptime of 95% or better for every 24 hours.

2.3.2 Portability

Portability refers to the ability of a system to execute on multiple platforms while retaining its functional and non-functional properties.

Requirement: The user-facing interface should, at a minimum, satisfy functional properties 1-4 on a number of different platforms and browsers. For mobile phones, it should support Chrome on Android and Safari on iOS. On laptops/desktops, it should support both Chrome and Safari.

2.3.3 (Bonus) Efficiency

Efficiency describes the system's performance requirements. The match making algorithm should run as fast as fast as possible to minimize the time it takes to generate a new set of matches.

Requirement: The match-making algorithm should take less than 5 seconds to complete given a pool of 100 badminton players.

2.3.4 (Bonus) Evolvability

Adaptability describes how well the system adapts to new requirements to the software. Every time that a new requirement is introduced into one component of the system, other components of the system should still function correctly without needing intervention. This property is important to our system since the requirements may change based on the badminton club over time.

Requirement: The system should be adaptable to clubs with different number of courts and different game types for each court.

3 Mockups

☰ ShuttleQL	☰ ShuttleQL	☰ ShuttleQL
Court 1 King's Mount Erin Chow VS Jessica Plat	Court 1 King's Mount Erin Chow VS Jessica Plat <div> New session started You are playing at: Court 2 Lion's Den OK </div>	Victory Court 3 2016/05/24 Erin Lee VS Cindy Chu 21 - 15
Court 2 Lion's Den Chai Men VS Gary Teo Lance Dong John Valent		Defeat Court 3 2016/05/24 Erin Lee VS Cindy Chu 16 - 21
Court 3 Aspirant's Plain Cherry Chu VS Larry Lament Lee Wang Tina Liu	Court 3 Aspirant's Plain Cherry Chu VS Larry Lament Lee Wang Tina Liu	Defeat Court 5 2016/05/24 Erin, John VS Lee, Brandon 19 - 21
		Victory Court 5 2016/05/24 Erin, John VS Lee, Brandon
		Victory Court 7 2016/05/24 Erin, Cindy VS Tina, Jesse 21 - 9
		Defeat Court 2 Erin Lee VS Brad Ming 10 - 21