CS 319 Object-Oriented Software Engineering

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Deliverable 3 - 1st Iteration

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Design Goals

1. Reliability

We prioritized reliability as our top design goal because the previous system lacked this feature the most. Previously, operations for customers (counselors) and users (coordinators and tour guides) were managed through shared Google Sheets and Excel files. For example, tour guide activity tracking and tour schedules were stored in shared documents accessible to everyone. This setup introduced significant risks, as sensitive data -such as puantage/payment details or tour schedules- could be accidentally or intentionally modified by unauthorized users.

Our application aims to minimize these errors by streamlining operations for creating or modifying schedules, puantage tables, and statistics. Additionally, it will securely manage sensitive information, such as school prioritization details, tour feedback, and tour guide statistics. Access to this data will be role-based, ensuring that end users only have authorization for specific operations. For instance, feedback data will only be visible to coordinators and executives, not tour guides.

Another example of why reliability is addressed is because it is a relevant criterion for the handling of counselor applications. Once an application is approved and the relevant notification is sent to the counselor, the likelihood of a tour being canceled due to BTO office decisions is extremely low. Edge cases, such as a tour guide canceling their application, are mitigated by scenarios where an advisor steps in or a replacement tour guide is assigned for the time slot. This ensures smooth operations and reliability across all processes.

By implementing these measures, we intentionally limit the system's functionality to ensure security and reliability. Not every function is accessible to every user; instead, users must have proper authorization to access specific features. For example, limiting tour guides to viewing only their own puantage data restricts functionality but enhances data integrity. Similarly, tour guides cannot modify pre-approved tour dates

or the list of schools deemed suitable for tours, ensuring that sensitive information remains protected and decisions remain centralized.

2. Usability

Our end product is primarily designed for counselors and tour guides, with a goal of attracting as many qualified schools as possible. To achieve this, the application must be highly user-friendly. High school counselors, who are one of the main user groups, often have limited familiarity with technology. Therefore, we aim to create a straightforward interface that will not overwhelm or discourage them from using the application to register and manage tours. A complex system could lead to frustration, resulting in reduced motivation to engage with the application.

For tour guides, simplicity is equally critical. The user interface should allow them to effortlessly update their activities, such as tracking completed tours, reporting attendance, or logging their availability. By reducing the time and effort required for these tasks, the application becomes an efficient tool rather than a burden.

A clear and accessible interface will also make it easier for coordinators to track updates, monitor changes, and oversee operations efficiently. A well-designed system will motivate coordinators to shift from the previous system of managing schedules and payments, reducing errors and inefficiencies.

To enhance usability, we chose not to activate two-factor authentication for logging into the system, prioritizing ease of access for counselors and tour guides. However, this decision introduces a trade-off between usability and security, as it increases the risk of unauthorized access to sensitive data. This approach supports simplicity, and we will manage risks using role-based access controls and activity tracking to balance usability and security.

System Decomposition Diagram
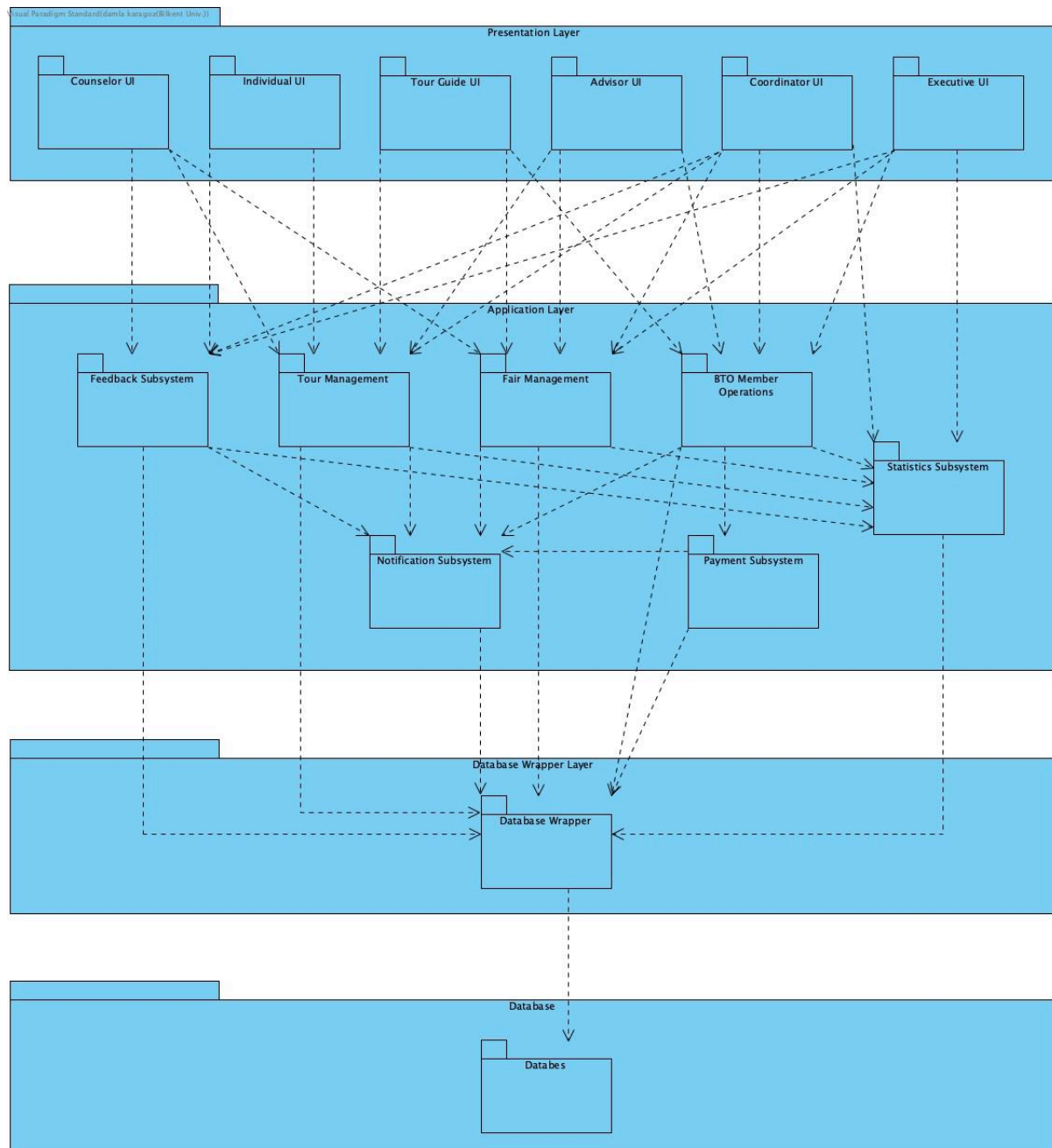
Subsystems

1. **Feedback Subsystem**: Handles user-generated feedback for tours and fairs, allowing counselors to submit ratings and comments that improve future activities.

2. **Tour Management**: Manages tour applications and schedules, facilitating the assignment of guides and approval or cancellation of tours.

3. **Fair Management**: Manages the organization of fairs, including receiving the application from counselors and confirmation by coordinators.

4. **Notification Subsystem**: Delivers notifications to users regarding system events such as any application approvals, cancellations, and payments.

5. **Payment Subsystem**: Manages the financial aspects of the system, such as calculating and processing payments for tour guides and directing the information to accountants.

6. **BTO Member Operations**: Offers tools for managing system users, excluding counselors.

7. **Statistics Subsystem**: Provides data insights, such as alumni success rates and tour/fair performance, to support decision-making for executives and coordinators.