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1 Design Goals

The top 2 design goals for our project will be the Security and Usability of the web application.Security is a necessary aspect in this web application because we deal with large amounts of private data, and usability is important to make the experience of the user seamless and smooth with minimal confusion and complications.

1.1 Security

Justification:

Our system will record the data of multiple tour and fair applications made by different high schools and individual students. These applications will include the contact information of these users and some possible personal details. Therefore the data within the system needs to be kept private and secure, and only be visible to the intended authorities. No guest user should be able to view details of the applications made by other guest users. As for authorized users (who need to log in), their login information will be stored in the system, and this data needs to be kept private and secure.

Tradeoff:

Encrypting and decrypting data using AES-256 adds extra processing time for our computer, especially for large datasets. This can slightly slow down read/write operations in the database.

In a poorly designed system access control can add latency to the user requests with the system.

Managing the encryption keys adds another level of complexity to the system.

1.1.1 Data Encryption

We will be securing our web application using multiple security protocols and encryptions. We will make use of HTTPS (TLS 1.3 or higher) to make sure our communications between the client and server are secured and cannot be intercepted. When sensitive data (e.g., student names, contact information, high school data, counselor details) is at rest within storage in the server we will store it using AES-256 encryption. We will use a secure Key Management System to store encryption keys.

1.1.2 Access Control

We will have a role based access control where only authorised roles can access sensitive data. We will ensure that users and systems have access only to the data they need for their roles.

1.1.3 Session Control

We will enforce a short session expiration time and invalidate sessions after a certain period of inactivity and logout the user automatically.

1.1.4 Logs

Maintain detailed logs of all data access and modifications to monitor suspicious activity.

1.2 Usability

Justification:

It is vital for the users to be able to navigate through the web application easily without any unnecessary confusion caused by the UI. If the UI is too complicated the user might be confused about where to find which functionality. To avoid this we need to have similar related options consolidated into menus at one dashboard of the user, the menus will be named properly to clearly indicate what is contained in the menu options when they will be selected, and the name of the options should also be clear and concise. We will try to avoid creating too many menus so that it doesn't become repetitive and fatigue causing for the user.

Tradeoff:

While this design is helpful in making the experience seamless for the user, it adds a level of complexity for the new user who will have to go through a learning curve to fully familiarize themselves with the system because all the options are consolidated within drop down menus.

We will also have to avoid making too many menus, to avoid menu fatigue, but this can still occur to a certain extent despite our effort because of many functions of the web application.

To strike the perfect balance between complexity and simplicity in the UI we might need to conduct user tests which will add extra time to the development of the web application.

2 Subsystem Decomposition