**Project Title**

North University TA Management Suite

**Team Members**

* Member A (Team Leader): Handles overall project coordination and decision-making.
* Member B: In charge of backend development, particularly data management and TA matching algorithms.
* Member C: Leads frontend development, focusing on user interface and experience.
* Member D: Takes care of cloud infrastructure, with an emphasis on Azure integration and security.
* Member E: Responsible for quality assurance, including user testing and data validation.

**Project Overview and Solution Strategy**

**Introduction**

The Computer Science Department at North University experiences challenges in the effective management of Teaching Assistant (TA) roles — from the initial application process to assignments and performance evaluations. The TA Management Suite is designed to streamline this complex workflow by offering a unified platform designed for distinct user groups: TA applicants, department staff, TA committee members, and instructors.

**Project Understanding**

The project encompasses a variety of user groups, each with unique requirements. TA applicants seek a simplified application process; department staff necessitate an efficient mechanism for matching TAs to appropriate courses; TA committee members require a robust toolset for decision-making; and instructors benefit from a systematic method for evaluating TA performance. This understanding informs the solution strategy, facilitating a focus on essential functionalities while avoiding undue complexity.

**Proposed Solution Strategy**

**Phased Development**

A phased development approach is planned, initially focusing on the delivery of core functionalities for each user group. This approach allows for subsequent iterative enhancements based on user feedback.

1. Initial Release: Concentrates on enabling application submission, course input, and rudimentary TA-to-course matching.
2. Second Phase: Incorporates decision-making functionalities for TA committee members and introduces notification mechanisms.
3. Final Phase: Adds capabilities for instructor-led TA performance evaluations.

**User-Centric Design**

A focus on user needs is central to this project. By talking with users from each group and running regular usability tests, the system’s interface, and overall user experience will be fine-tuned to meet these needs effectively.

**Data-Driven Decision-Making**

In order to achieve a high level of efficiency and effectiveness, the project will employ a data-driven decision-making approach. Metrics such as the rate of application submissions, the speed of TA-to-course assignments, and TA performance evaluations will be closely monitored. The data collected will serve as a foundation for continuous improvements to the system. It will be particularly useful for optimizing the algorithms responsible for matching teaching assistants to appropriate courses.

**Modular Architecture**

To keep the system both manageable and adaptable, a modular architecture will be followed. Core functionalities like application submissions, TA-to-course matching algorithms, decision-making protocols, and performance evaluations will each be a standalone component. This structure will not only make it easier to maintain the system but will also allow new features to be added seamlessly in the future.

**Cloud-Based Infrastructure**

A cloud-first approach will be employed, leveraging Microsoft Azure services such as App Service for web hosting and Blob Storage for document management, ensuring scalability and reliability without the burden of extensive infrastructure management.

**Conclusion**

The solution strategy for the TA Management Suite aims to be both adaptable and focused. By implementing a phased, user-centric, and data-driven methodology, the system is expected to meet existing challenges effectively, while also being scalable for future requirements.

**Key Challenges**

* User Adoption: Making the system easy to use so everyone can switch from the old ways without a hassle.
* Data Integrity: Keeping all types of data, like applications and evaluations, accurate and consistent.
* Algorithmic Complexity: Creating smart algorithms to match TAs with courses, taking into account various factors like skills and experience.
* Scalability: Making sure the system can handle more users and data over time without slowing down.
* Security and Compliance: Protecting sensitive data like CVs while following legal rules on data privacy.
* Multi-role Coordination: Making a system that meets the different needs and access levels of TAs, staff, committee members, and instructors.

**Technology Stack**

The web application will be built using Python for the backend to enable robust, scalable features. Microsoft Azure’s suite of services will be used to fulfill various requirements, ensuring high availability, security, and scalability.

**Web Hosting & User Management**

* Azure App Service will host the web application.
* Azure Active Directory will be employed for user authentication and role-based access control.

**Data Storage & Management**

* Azure SQL Database will manage structured data such as application statuses, course details, and TA assessments.
* Azure Blob Storage will be used for storing applicants’ CVs and other associated documents.

**Automation & Communication**

* Azure Logic Apps or Azure Functions will be responsible for automating routine tasks, such as generating preliminary TA assignment recommendations.
* Azure Notification Hubs will handle the notification system for informing applicants of their application statuses.