**Project Report: Smart Bus Management System**

**Project Overview:**

**Project Title: Smart Bus Management System**

**Team Members: Ismail Asif (213019), Mehmood Nadeem (213190)**

**Supervisor: Mughees Ahmad**

**Subject: Virtual Programming**

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**1. Framework:**

**Identity Framework:**

**We have implemented the Identity Framework to handle authentication processes, including user registration, login, and logout.**

**2. Models:**

**Several models have been utilized within the Identity Framework, along with our main models:**

* **Application User Model**
* **ApplicationDbContext Model**
* **Expenditure Model**
* **Student Model**

**3. Controllers:**

**Controllers serve the crucial function of transferring data from views to the respective models. Key controllers used on the main page include:**

* **HomeController**
* **ExpendController**

**4. Views/Pages:**

**A variety of views have been created to cater to different functionalities. The initial page, \_Layout.cshtml, serves as a central hub. Noteworthy pages include:**

* **Home Views Folder**
* **Index**
* **Delete**
* **AdminIndex**
* **List**
* **Create**
* **Detail**

**Expend Folder**

* **Index**
* **Delete**
* **Expend**
* **Create**
* **Detail**

**5. Authorization:**

**Authorization has been implemented at both the controller and model levels. Students can access the card with login information post-registration. Specific authorizations include:**

1. **Students cannot view student list details or expenditure list.**
2. **Students are authorized to apply for a student bus card.**
3. **Downloading the card view is permitted, ensuring integrity.**

**6. Authentication:**

**Authentication features empower the Admin to authorize cards and modify student and expense data.**

**7. Libraries:**

**Several libraries enhance the project's aesthetics and functionality:**

* **Bootstrap**
* **JQuery**
* **Google Fonts**

**8. Database SQL Server:**

**Post-implementation of the Identity Framework, models, and migrations have been added to customize the database. The database is automatically created and updated once the project is running.**

**9. Testing and Quality Assurance:**

**A comprehensive testing approach has been employed, covering unit testing, integration testing, and user acceptance testing, ensuring the robustness and reliability of the Smart Bus Management System.**

**10. Deployment:**

**The project has been successfully deployed, with detailed server configurations and hosting platform information ensuring accessibility for users. Deployment tools have been utilized for a seamless deployment process.**

**11. User Documentation:**

**Extensive user documentation, including user manuals and guides, has been provided to assist users in navigating and utilizing the features of the Smart Bus Management System.**

**12. Maintenance and Support:**

**Plans for ongoing maintenance and support have been outlined, including updates, patches, and enhancements. Contact information and support channels are available for users encountering issues.**

**13. Project Challenges and Solutions:**

**Challenges faced during the development process have been transparently discussed, with detailed solutions implemented to overcome obstacles, showcasing effective problem-solving.**

**14. Future Enhancements:**

**Potential features and improvements for future iterations of the Smart Bus Management System have been identified, providing a roadmap for continuous development and enhancement.**

**15. Acknowledgments:**

**Gratitude is extended to individuals and organizations that significantly contributed to the project's success, including advisors, mentors, and contributors.**

**16. Conclusion:**

**The Smart Bus Management System achieves key objectives, surpassing expectations with its robust framework, well-defined models, and user-friendly interface. The comprehensive report provides insight into the project's development, challenges, and future potential.**