**Week4 DFD on Student Registration System Report**

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**DFD on Student Registration System Report**

This report outlines the Physical Data Flow Diagrams (DFDs) for the refined design of the University Student Registration System. The existing legacy registration system suffers from common issues such as outdated functionality, messy user interfaces, and inconvenient processes. Our proposed redesign offers a potential solution to these challenges. The system design focuses on key functions such as course listing display, student enrollment, billing, and related data storage.

By analyzing the system from the top context diagram down to the detailed decomposition level, we have established clear and well-defined boundaries around the system’s four main partitions. These partitions effectively group related processes into manageable modules, reducing system complexity, enhancing maintainability, and improving overall performance. Partitioning ensures that each module functions independently, which allows for smoother updates, better scalability, and easier troubleshooting.

**Authentication Process**

The first partition is the Authentication Process, which plays a critical role in validating the user’s identity and authorizing their actions within the system. This partition ensures that students can access their personalized dashboard to view registered courses, billing information, and available courses, but limits their access to other functions, such as editing course details or viewing teaching staff schedules. Partitioning authentication process ensures security by isolating access control from other modules, protecting sensitive data while enhancing the user experience by guiding students directly to permitted actions.

**Student Dashboard Process**

The second partition is the Student Dashboard Process, where students can quickly access frequently used features. This includes viewing registered courses, checking remaining required credits, and performing shortcut operations such as paying bills or accessing course schedules. Partitioning this dashboard allows for modularity in the design, making it easier to update frequently accessed information without disrupting other system components. This process also ensures quick access to real-time data, improving the overall user experience by providing relevant information briefly.

**Course Selection and Enrollment Process**

The third partition, which is the most critical, is the Course Selection and Enrollment Process. This process is often a pain point in legacy registration systems, where students are left confused due to outdated course availability information. Partitioning this process ensures that course selection is treated as a prerequisite for enrollment, enforcing logical steps in the workflow. The system provides real-time feedback on course availability, eliminating confusion and improving student satisfaction. Additionally, we have enhanced the process by introducing filters and fuzzy search options for course number, course name, and status, allowing students to easily find desired courses and make informed decisions. This partition also ensures that updates in course availability are processed instantly.

**Billing Process**

The fourth partition is the Billing Process, which allows students to view their tuition balance, download bill statements in PDF format, and make payments. This process is isolated to handle specific financial transactions, ensuring security and proper error handling. For example, if a student's credit card is invalid, expired, or has insufficient funds, the system will reject the transaction and notify the student with clear guidance on how to resolve the issue. Additionally, students will receive payment confirmations once a valid transaction is completed. By partitioning the billing process, the system ensures that financial operations are separate from other student activities, thereby improving reliability and minimizing the risk of errors or fraud.

**Summary**

This Physical DFD of student registration system breaks down key business activities, such as login, course selection, and enrollment, into smaller, manageable sub-processes. This approach ensures a deep understanding and effective handling of complex tasks like course capacity management and validation. Integration with Master Data Stores is central to the design, ensuring seamless interaction with the Student Master, Course Master, and Degree Program Master. Real-time data retrieval and updates enable accurate processes, such as fetching course listings and validating credit limits. Error Handling and Validation steps are built into each process, ensuring robust system performance even in edge cases. Password verification, course availability checks, and concurrent enrollment handling all contribute to a smooth user experience. Finally, the design emphasizes scalability and modularity, allowing new features to be easily added or modified without disrupting the entire system. This ensures flexibility for future growth and adaptability to changing requirements.

**References**

GeeksforGeeks. (2024, May 14). Types and Components of Data Flow Diagram (DFD). *GeeksforGeeks*. <https://www.youtube.com/watch?v=D-UtpQ8jVRg>