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**1. Background, Existing Problem, Objective, Proposed Solution, and Scope of the New System**

*Background:*

Similar to other universities, Admas University's office finance department is responsible for a variety of financial tasks, such as managing student tuition fees, salaries for staff, budgeting for departments, handling accounts payable and receivable, and producing financial reports. These processes are often done manually or using outdated systems, leading to inefficiencies, errors, and delays.

*Existing Problem:*

Data Fragmentation: Financial data is often scattered across different systems or spreadsheets, making it difficult to maintain consistency and track transactions.

Manual Processes: Much of the data entry and reporting is done manually, which increases the chances of human error.

Lack of Real-Time Data: Financial data is not always updated in real time, which can affect decision-making.

Security Issues: Sensitive financial data may not be properly secured, increasing the risk of data breaches.

Limited Reporting Capability: The ability to generate comprehensive and timely reports is often limited, affecting both internal decision-making and compliance.

*Objective:*

The objective is to design and implement a centralized, automated financial management system for the university that improves the efficiency, accuracy, and security of financial data management. The system will:

Store and manage financial data in a centralized database.

Automate data entry and reduce human error.

Provide real-time access to financial information.

Offer robust reporting and analysis tools for financial decision-making.

Ensure data security and compliance with regulatory standards.

*Proposed Solution:*

The proposed solution is a University Finance Management System (UFMS) that will:

Centralize Financial Data: Store all financial records, such as student payments, staff salaries, department budgets, and transactions, in one system.

Automate Workflows: Automate processes like fee collection, payroll processing, and report generation.

Real-Time Updates: Provide real-time access to financial data for all authorized users.

Reporting and Analytics: Generate real-time financial reports, projections, and analysis.

Secure Data Storage: Implement strong security measures to protect sensitive data.

*Scope of the New System Regarding Data Management:*

The new system will cover the following aspects of data management:

Student Financial Records: Manage tuition fees, payments, and billing history.

Staff Payroll: Manage staff salary details, deductions, and payment history.

Financial Transactions: Track accounts payable and receivable, manage cash flows.

Budgets and Expenditures: Manage departmental budgets and track expenses.

Reports and Analysis: Generate financial reports, audits, and projections.

Data Security: Ensure secure access, backups, and encryption of sensitive financial data.

**2. Entities and Attributes for the Database**

Entities and Their Attributes:

**1.STUDENT**

Attributes:

StudentID (Primary Key)

FirstName

LastName

EnrollmentDate

Program (e.g., undergraduate, postgraduate)

DepartmentID(foreign Key)

**2.Staff**

Attributes:

StaffID (Primary Key)

FirstName

LastName

Department

Salary

HireDate

**3.Transaction**

Attributes:

TransactionID (Primary Key)

Date

Amount

Description

TransactionType (e.g., payment, refund)

StudentID (Foreign Key)

StaffID (Foreign Key, for payroll transactions)

**4.Department**

Attributes:

DepartmentID (Primary Key)

DepartmentName

Budget

**5.Payment**

Attributes:

PaymentID (Primary Key)

Date

Amount

PaymentType (e.g., cash, bank transfer)

StudentID (Foreign Key)

TransactionID (Foreign Key)

**6.Budget**

Attributes:

BudgetID (Primary Key)

DepartmentID (Foreign Key)

Year

AllocatedAmount

AmountSpent

**3. Relationships and Cardinalities Among Entities**

|  |  |  |  |
| --- | --- | --- | --- |
| **Entities Involved** | **Relationship** | **Cardinality** | **Foreign Key** |
| STUDENT↔ DEPARTMENT | A student belongs to a department | Many-to-One | DepartmentID in STUDENT |
| STAFF↔ DEPARTMENT | A staff member works in a department | Many-to-One | Department in STAFF |
| STUDENT↔ TRANSACTION | A student can have multiple transactions | One-to-Many | StudentID in TRANSACTION |
| STAFF↔ TRANSACTION | A staff member has multiple transactions | One-to-Many | StaffIDinTRANSACTION |
| STUDENT↔ PAYMENT | A student can make multiple payments | One-to-Many | StudentID in PAYMENT |
| TRANSACTION↔ PAYMENT | A payment corresponds to one transaction | One-to-One | TransactionID in PAYMENT |
| DEPARTMENT↔ BUDGET | A department has budgets for each year | One-to-Many | DepartmentID in BUDGET |

**4. Entity-Relationship (E-R) Diagram**