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Budget Allowance System based on Java

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Abstract: *Budgeting is an component of managerial accounting. During this process, companies decide how much money they will set aside for future goals and development. The organization will develop an effective budget for the firm as a result of this approach. The major objective of the budget is to develop the business and reduce the amount of misallocation of resources and expenses, and most organizations fail in this process. This research paper presents the design and implementation of a simplified budget allocation system for a college. The project aims to provide a foundational understanding of budget allocation processes and serves as a starting point for more complex and robust systems. The system, developed in Java, simulates a basic backend for a college budget allocation process. It allows users to allocate budgets to different departments, retrieve budget information for specific departments, and view a summary of all budget allocations. While the system does not include a full-fledged backend with a database, it provides insights into the core functionalities required for budget management. The system's core functionalities are implemented within the "CollegeBudgetSystem" class, which employs in-memory data structures to manage budget allocations. Users can interact with the system through a text-based command-line interface, performing actions such as allocating budgets, retrieving budget information, and printing budget summaries. While this project serves as a basic prototype, real-world budget allocation systems in educational institutions would require a more sophisticated architecture. Future research and development could focus on integrating a database for secure data storage, implementing user authentication and authorization, and creating web-based or mobile-friendly user interfaces. This research paper contributes to the understanding of budget management in educational institutions and provides a foundation for building more comprehensive budget allocation systems tailored to the specific needs and complexities of colleges and universities.*

Keywords: *GUI-based application, I/O operations, I/O stream, JDBC connectivity, hashmap, iterator, MySQL*

I. INTRODUCTION

Budgeting is an important policy tool for both government and business management. It is a common practice in many people's private lives, businesses, governments, and volunteer organizations. Usage budgets are used in government circles much more often than they are in private sector businesses. The traditional comprehensive budget management of businesses typically uses the fixed budget approach throughout the year, unless the actual operation significantly deviates from the budget plan, in which case it will be decided to adjust, putting forth the requirements for the accuracy of budgeting. However, the information gathered by the appropriate staff during the budgeting process is frequently insufficient, the coverage is not comprehensive enough. Making sure that budgeting is logical and scientific can be challenging. One of the most crucial and significant processes in every organization is budget management. Each organization is required to manage its yearly budget in order to carry out various tasks throughout the final year. We developed a GUI-based application to streamline budget management tasks after taking this need into account. It is an application related to budget management for students. Each activity listed during the academic year has a budget requirement attached to it.

II. LITERATURE REVIEW

The hardest part of running a business is implementing a budget management system. Budgeting is the practice of creating a financial plan, wherein a budget serves as the blueprint for money management. Constructing such a plan allows you to forecast your financial situation ahead of time, enabling you to assess whether you will have sufficient funds to achieve your objectives. It will be a web application that will effectively provide the incoming and outgoing budget for the many college departments. This technology will also be utilized to deliver a departmental financial report[1]. Conventional, all-encompassing budget administration used past data for forecasting, often involving manual compilation, which left room for the subjective influence of the compilation team and external factors. As a result, budget deviations frequently happen. If a dynamic adjustment is not done in a timely manner, the budget will be unable to properly support business decision making. The big data age gives businesses the chance to more readily gather data from both internal and external sources, which helps them improve budgeting and carry out their strategic planning more precisely and scientifically. This paper delves into the core principles of big data and comprehensive budget management within the framework of the big data era.

It examines the challenges and underlying reasons associated with current corporate budget management practices and puts forward remedies aimed at enhancing overall budget management for enterprises in the age of big data. The study's findings might serve as a guide for businesses undertaking thorough budget management in the big data era.[2].

A significant place was held in the enterprise's strategy by the comprehensive budget management as a management technique. The consequences of implementing thorough budget management, however, have not been ideal for many Chinese logistics companies, who have run into a number of the same issues. The businesses ignored the issues or thought that the budget would cause too much trouble and restrictions in the face of a range of internal and external circumstances. As a result, the businesses started to diverge from their initial goals and placed less of a focus on budget control. Looking at logistics companies, this paper will address problems in enterprise-wide budget management, including a lack of employee management consciousness, a subpar information level in the comprehensive budget management system, and a deficit in strategic management awareness within enterprises. Building on a review of relevant literature, we conducted extensive research by visiting numerous logistics firms and conducting in-depth interviews with their managers and employees. For the issues that exist in the complete budget management of logistics firms, I will provide the appropriate recommendations.[3].

The creation of objectives by the management of the organization is a part of budget control and budgeting, as is the creation of a framework that allows the organization to reflect properly on a planned activity as a whole. Budget control refers to the process of creating an efficient strategy to guarantee the intended outcome, whereas the budget refers to the percentage of these planned activities in terms of funds. Because of the importance of the aforementioned, the Nigerian National Petroleum Corporation was given special consideration in this study's comprehensive examination of budgets and budget management in government organizations (NNPC). Basic information was gathered for the research's objectives using a well-structured questionnaire given to respondents, while secondary information came from yearly financial statements, files, memoranda, tax regulations, and the NNPC gazette. The results showed that all stakeholders involved in budget preparation, while taking into account government procedures, with an emphasis on deliberate implementation and honesty, by all responsible officials, was a necessary and sufficient condition for achieving an effective budget and budget management[4].

III.METHODOLOGY

Based on the gathered requirements, a system architecture was designed. The architecture comprised three key components:

A. User Interface

Developed using Java Swing, providing an intuitive interface for administrators to input budget allocation data. The user interface component serves as the front-end of the system, providing a graphical user interface (GUI) for college administrators to interact with the budget allocation system. Java Swing was chosen as the technology for the user interface due to its platform-independent nature and extensive library support for building rich desktop applications. The user interface allows administrators to log in securely, input budget allocation data, review allocation recommendations, and access reports and historical budget data.

I/O operations are quick thanks to Java's use of the stream concept. Each class needed for input and output operations can be found in the java.io package. By using the Java Input/Output API, we can handle files in Java. Java I/O stream is used to perform read and write operations. Java.util.hashmap class is used to create table (where we have allocated different categories as user wants). Also other classes like Iterator (used for looping), Map (used for mapping key and value) and Scanner (to get user Input).

B. Backend Logic

This project was implemented in Java, responsible for processing user input, making allocation recommendations, and interacting with the database. The backend logic component is responsible for processing user inputs, making budget allocation recommendations, and managing the interaction with the database. The "backend" functionality is implemented within the CollegeBudgetSystem class. This class acts as a basic backend for the project, managing the data (budget allocations) and providing functions for manipulating and retrieving that data.

Here's an explanation of how the backend functions work in this project:

1) Data Storage

```
(private Map<String, Double> departmentBudgets)
```

The CollegeBudgetSystem class uses a Map data structure to store budget allocations. In this map, department names (strings) are used as keys, and the corresponding budget amounts (doubles) are used as values. This in-memory data structure simulates a basic form of data storage. In a real-world system, you would typically use a database to store and manage this data.

2) *Allocate Budget*

(Public void allocateBudget(String department, double amount))

This method allows you to allocate a budget to a specific department. If the department already exists in the map, the method adds the provided budget amount to the existing budget. If the department does not exist, it creates a new entry in the map.

3) *Get Budget*

(Public double getBudget(String department))

This method allows you to retrieve the budget for a specific department. It takes the department name as an input parameter and returns the corresponding budget amount. If the department does not exist in the map, it returns a default value of 0.0.

4) *Print Budget Allocations*

(Public void printBudgets())

This method prints a list of all budget allocations. It iterates through the departmentBudgets map and displays each department's name and budget.

5) *Main Method*

(Public static void main(String[] args))

The main method serves as an entry point for the application. It provides a command-line interface for users to interact with the budget allocation system.

C. *Database*

MySQL was chosen as the relational database management system for its scalability and data integrity features.

Flowcharts

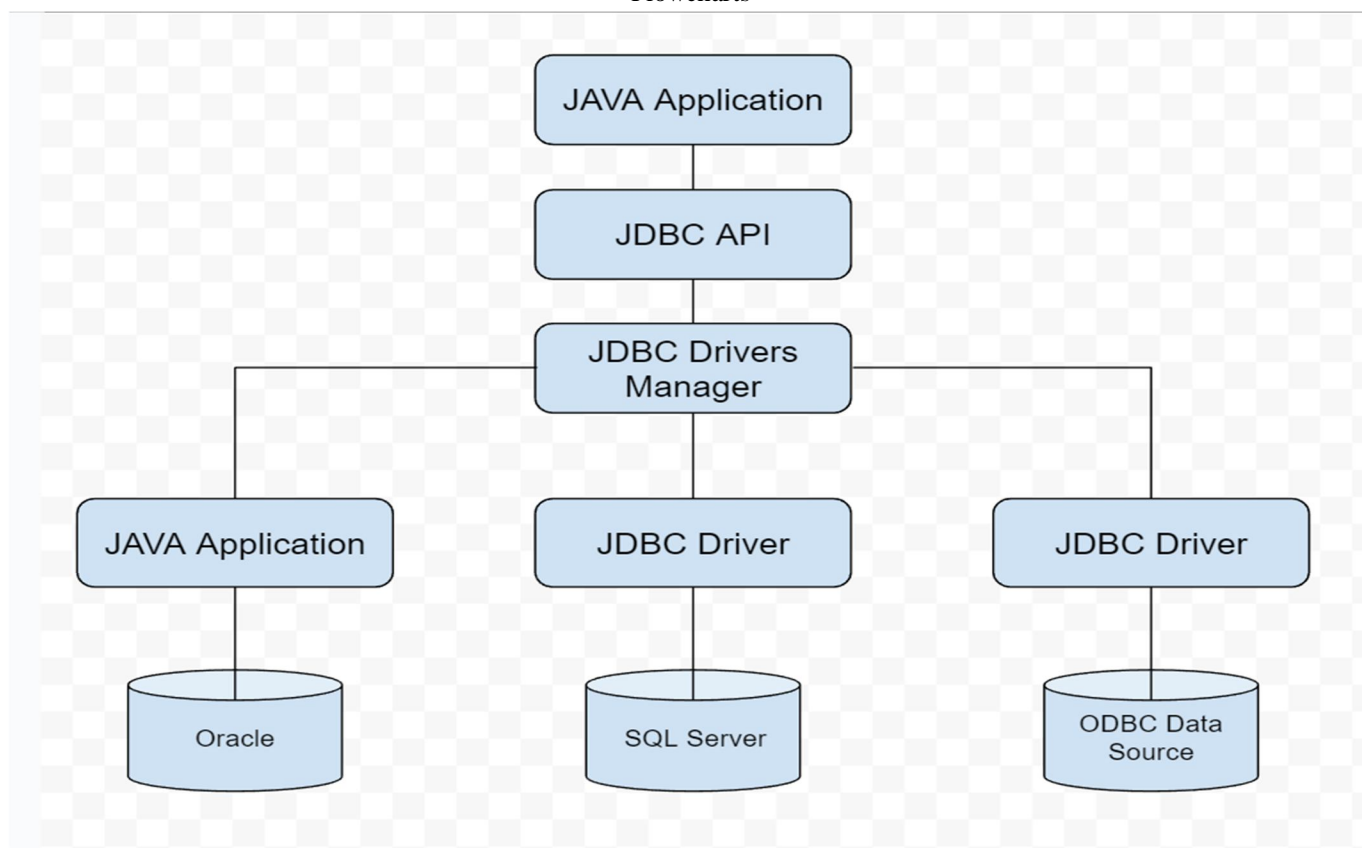


Fig. 01 JDBC connectivity Flowchart

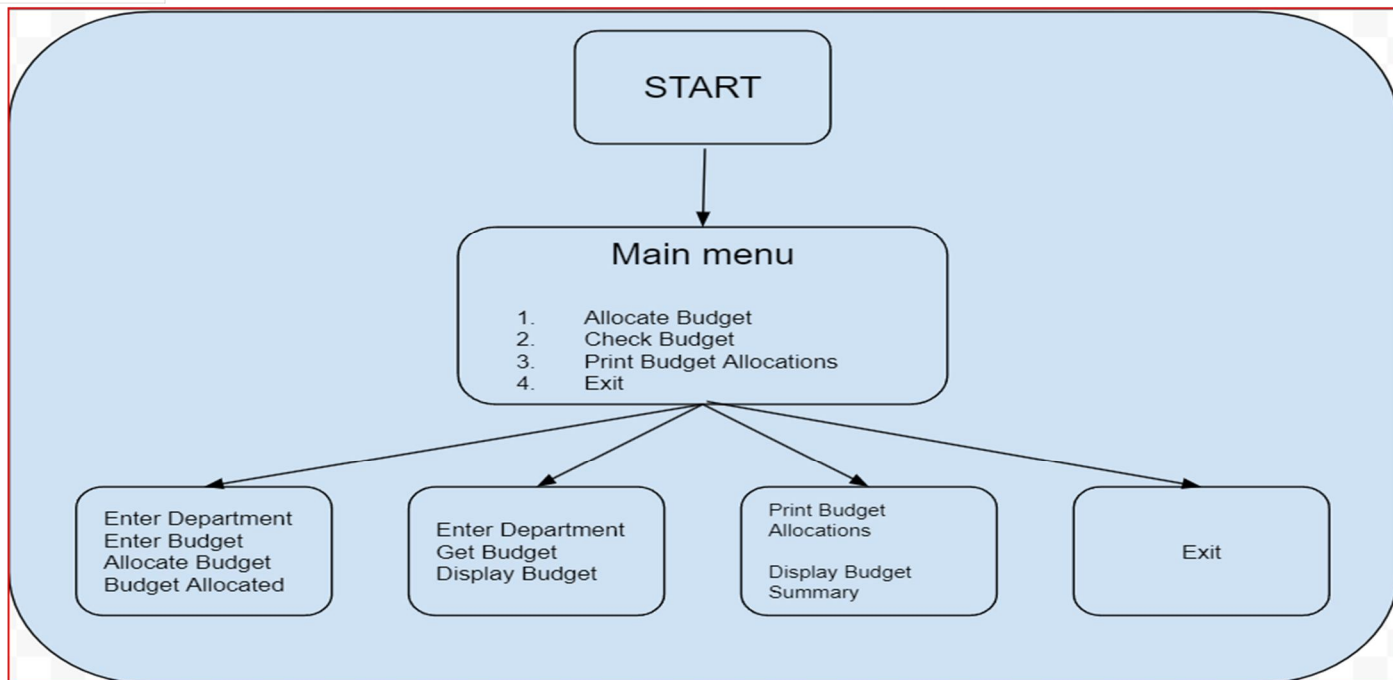


Fig. 02 Working Flowchart

IV. FUTURE SCOPE

In future, we can implement user authentication to ensure that only authorized personnel can access and modify budget allocations. We can use an Object-Relational Mapping (ORM) framework like Hibernate or JPA for seamless database interaction. Develop a web-based user interface to allow users to interact with the system through a browser. Implement security best practices, including encryption, intrusion detection, and regular security audits to protect sensitive financial data.

V. CONCLUSION

The budget allocation system presented here provides a foundational framework for managing budget allocations within a college or educational institution. While this project serves as a basic illustration of the concept, it is essential to recognize its technical limitations and the need for further development to meet real-world requirements.

The system showcases basic data management principles, utilizing an in-memory data structure to store budget allocations. However, in a production environment, a robust database management system would be essential for secure and persistent data storage. The command-line interface offers a means for users to allocate budgets, check allocations, and print summaries. In practice, a more user-friendly web interface or mobile application would be necessary to accommodate a broader user base. The project lacks advanced security features such as user authentication and authorization, encryption, and protection against common security vulnerabilities. Security is paramount when handling sensitive financial data. For large-scale usage, the project would need optimization for scalability and improved performance. This might include load balancing, caching mechanisms, and database optimization.

VI. RESULTS

As the project is based on Java we have created it as a window based API. This project works by monitoring our monthly expenses. Keeping track of your daily expenses requires collecting the data or using ready made data for analyzing budget patterns. Expenses are divided into categories like academics, administration, facilities, student services, R&D, Technology & IT infrastructure, emergency funds, capital expenditures faculty development, marketing & outreach, contingency & reserves, athletics & sports, diversity & inclusion initiatives, alumni relations, sustainability initiatives, library resources, and grants & sponsored programs. The user can edit, add, or even delete any category he wants. Determining weightage for the categories according to the expense. The project allocates a percentage of the budget to the different categories according to your budget pattern. It takes budget input from the user.

Then computing budget data according to the weightage. After computing the budget with the allowance made by the user it displays the budget in Percentage. The project demonstrates the basic principles of data management for budget allocations within an organization. It uses an in-memory Map to store department names and their corresponding budgets. In a real-world scenario, this would be replaced with a proper database for data persistence.

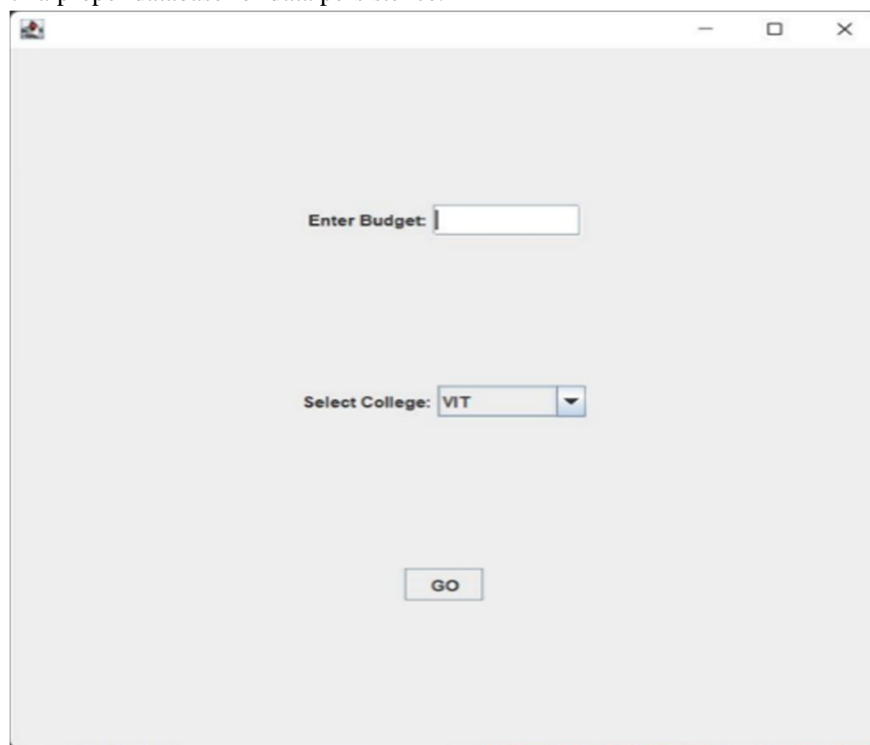


Fig. 3 Home Page

VII. ACKNOWLEDGMENT

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