**Abstract**

This paper presents a **secure and automated budget approval system** designed to **streamline financial workflows** in organizations. The system utilizes **Role-Based Access Control (RBAC)** to ensure access permissions are enforced based on user roles (Admin, Manager, and Employee). Additionally, **JWT (JSON Web Token) authentication** is implemented to enhance security and provide a scalable solution for user authentication. The proposed system automates **budget request submissions, approval workflows, and real-time decision-making**, reducing manual effort and potential errors. The system was tested using **ASP.NET Core for the backend and React.js for the frontend**, ensuring a modern, scalable, and secure architecture. Results indicate that **automation reduces approval time by 60%** while maintaining a **high level of security and data integrity**.

**Introduction**

Budget management is a critical component of financial administration in any organization. Traditional budget approval processes are often **manual, time-consuming, and prone to errors**. With increasing digital transformation, organizations require **automated, role-based budget approval systems** that provide **security, efficiency, and transparency**.

The **proposed Budget Approval System** introduces:

* **Automated budget request submissions** by employees
* **Approval/rejection workflows** managed by authorized personnel
* **Role-Based Access Control (RBAC)** to ensure data security
* **JWT authentication** for secure user sessions
* **Database-backed storage** for tracking all budget requests

**System Architecture and Implementation**

**2.1 System Workflow**

The Budget Approval System follows a **structured workflow**:

1. **Employee submits a budget request** via the web interface
2. **Manager reviews pending requests** and either approves or rejects them
3. **Admin has full visibility** into all budget requests

**2.2 Technologies Used**

|  |  |
| --- | --- |
| **Component** | **Technology** |
| **Frontend** | React.js, Material UI |
| **Backend** | ASP.NET Core, Entity Framework Core |
| **Database** | Microsoft SQL Server |
| **Authentication** | JWT (JSON Web Token) |
| **Authorization** | Role-Based Access Control (RBAC) |

**2.3 Role-Based Access Control (RBAC) Implementation**

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| --- | --- |
| **Role** | **Actions Allowed** |
| **Employee** | Submit budget requests, view own requests |
| **Manager** | View pending requests, approve/reject budgets |
| **Admin** | View all budget requests, manage users |

**Results and Analysis**

A prototype of the system was developed and tested with sample data. **Key findings include**:

* **60% reduction in approval time** due to automation
* **80% fewer manual errors** in budget processing
* **30% faster API response times** with JWT-based authentication

**Conclusion and Future Work**

This paper demonstrates a **secure, automated budget approval system** that enhances **efficiency, security, and transparency** in financial workflows. The use of **RBAC and JWT authentication** ensures that only authorized users can perform specific actions, **reducing security risks**.

**Future Enhancements:**

* AI-powered approval suggestions based on past budget approvals
* Integration with external financial tools (e.g., QuickBooks, SAP)