Web based Payment Tracking and Accounting Application

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Abstract— **The Payment Tracking System (PTS) is a sophisticated web-based platform designed for proficiently tracking and managing payments from various vendors. It serves as a centralized hub for consolidating payment requests from the accounts department to upper management, thereby ensuring timely delivery of supplier payments through the implementation of integrated best practices for managing operations and services. The system boasts advanced Transaction Management functionality such as Invoice Generation and Payment Reminders, providing unparalleled visibility, insight, isolation, and swift resolution of payment-related issues for any type of organization by delivering the necessary information in a timely manner to the user. In today's fast-paced business environment, managing invoicing and chasing payments from clients can be a challenging task. This innovative application offers a solution to this problem by providing businesses with the capability to track payments from clients and gain valuable insights into their earnings. The system not only facilitates the creation, sending, and receiving of invoices, but also generates automated follow-up reminders for overdue payments. By utilizing this application, clients can also avoid incurring late fees**

Keywords—Invoice, Reminders, Transaction Management

I. INTRODUCTION

The Payment Tracking System is a highly advanced, web-based application that is specifically designed to streamline the process of tracking and managing vendor payments. It serves as a centralized hub for consolidating payment requests from the accounts department to upper management, ensuring that supplier payments are delivered in a timely and efficient manner through the implementation of best practices for managing operations and services.

This system is equipped with a wide range of Transaction Management features such as Invoice Generation and Payment Reminders, which enable organizations to have complete visibility and insight into their financial transactions, and also provide rapid resolution of any payment-related issues that may arise. By delivering the necessary information to the appropriate users at the appropriate time, it ensures that there is no disruption in the workflow of the organization.

The primary objective of this study is to develop a web-based system for tracking payments made to suppliers, which allows businesses to automate their financial transactions and maintain oversight of their payments. Utilizing Node.js with React as the front-end framework, this system has been crafted with an emphasis on scalability and modularity. This allows the system to be easily expanded or modified as per the needs of the organization. It utilizes a powerful and secure NoSQL database (MongoDB) and a widely accepted open-source server environment (Node.js) to overcome the limitations of manual systems. This ensures that the system is robust and secure, providing an efficient and reliable solution for tracking and managing vendor payments.

II. RELATED WORKS

Chandrashekhar M V designed a comprehensive system that can be used to improve billing and invoicing processes [1]. This system is built on a two-tier architecture and offers a variety of features to help users easily manage their finances. It allows users to add customers and create invoices, as well as generate sales and inventory reports. This system has the potential to revolutionize how retail businesses handle their finances, from invoicing to financial management. With this system, users can access powerful features that can help them save time and improve their operations.

P. Thanapal has developed an expense tracker to help individuals monitor their income and expenditure [2]. The tracker is designed to provide reminders to ensure expenses are kept track of, as well as including the ability to add details such as how much money is coming in from other sources and what payments or expenses are due on a given day or month. It also includes handy features to help categorize spending and view expenses by category, with the option to export expenses in a date range or to remove export files. This powerful tool enables users to manage their finances effectively and be more aware of where their money is going.

S. Chandini has designed a user-friendly expense management system to help individuals efficiently track their expenses [3]. This system is capable of storing various details related to a particular expenditure like the photo, location, and amount. It also allows users to organize their expenses based on the week, month, or year, removing the

need for manual calculations. Additionally, users can input their income to determine their daily expenses, which will be saved individually for each user. This expense tracker could be particularly beneficial for individuals who frequently go out, such as on trips or to the theater with friends. Moreover, it makes it simpler to divide the bill among the group and view it in a graph form.

Karim, Md. Abdul presented a concept for an expense tracker, with the goal of making the system simple, fast, and user-friendly [4]. This study features that will help the user in managing all financial operations, such as an electronic diary. With this tool, users can maintain a record of their everyday income and expenses, helping them to stay on top of their financial situation. The proposed tracking system is essential for those who lack the necessary organization and accountability to manage their finances. By accurately monitoring their income and expenses, users can free themselves from the stress of financial hardship and enjoy a better quality of life.

An analysis conducted by Dan Underwood at a university in Tennessee in 2011 looked into the expense tracker [5]. The accounting team designed Cost Allocation Tool 1, which uses a spreadsheet to allocate product categories by site and cooperation. Cost Allocation Tool 2 was then developed to further integrate and allocate costs to determine which manufacturers are profitable and which are not. Both spreadsheets were used to identify where expenses can be reduced or managed more efficiently.

Girish Bekaroo (2007) conducted research on an intelligent online budgeting system that manages expenses and provides graphical analysis of data [6]. This system utilizes the Rational Unified Process (RUP), which is more efficient and advantageous as it encourages code reuse and encapsulation. The technologies used include CSS and XML.

Businesses and retailers are constantly looking for ways to streamline the monitoring of their financial performance. To this end, specialized software and applications have been created to make the tracking of income and expenses simpler and more efficient.

These programs simplify the billing and expense tracking process, providing businesses with the ability to keep track of their expenditure in a daily, weekly, monthly, or annual basis. Furthermore, businesses can easily categorize their expenses for easier analysis. Additionally, some programs even permit users to divide bills among multiple parties, so they can avoid having to perform complex calculations.

By implementing such systems, businesses of all sizes can revolutionize their financial management, reducing their time and energy requirements. These tools are invaluable for the successful operation of a business, allowing owners to gain better insight into their financial performance.

III. EXISTING SYSTEM

With the constant advancement of technology and the ever-evolving business landscape, businesses are increasingly searching for ways to optimize their operations and reduce costs. One of the most significant challenges that businesses face is managing payment transactions and keeping track of due payments from customers.

Currently, businesses often rely on manual methods to handle these transactions, and while there are software solutions such as Tally that provide features such as company, supplier, and employee management with ledgers, there is still no application that integrates these features with accounting tools.

Other software such as Mobills, Prism, and Timely Bills offer interfaces that allow users to manage their expenses, set payment reminders for overdue payments, and provide insights into their spending. Additionally, applications such as Invoice Ninja and Invoice plane offer the ability to create custom invoices.

The proposed system aims to address this issue by providing an interface that allows businesses to complete all of their accounting needs such as payment tracking, ledger management, invoice creation, and budgeting, all within a single application. This will help businesses streamline their operations, save time, and ensure that all payments are received in a timely manner, thus making their financial operations more efficient and cost-effective.

IV. PROBLEMS IN EXISTING SYSTEM

Businesses today face a common challenge in their daily operations, which is the need for a single application that can handle all the necessary modules for their business operations, from generating invoices to sending out reminders for customers' and clients' due payments. Unfortunately, most existing applications are not tailored for business use and are not business-oriented, which results in businesses having to use multiple third-party applications to handle their financial transactions. Furthermore, these applications often lack the capability to track, manage, and generate bills and invoices within a single platform, which leads to inefficiencies and additional costs for businesses. Additionally, many existing applications are not compatible with modern transaction protocols, such as cryptocurrency payment protocols, which are becoming increasingly important in today's market.

To address these issues, businesses require an application that can provide a better security system, user-friendliness, standardized operations, and integration of all the modules necessary for their daily operations. Implementing such an application would require a thorough assessment of the requirements, process blueprinting, and organizational change management. By doing so, businesses would be able to streamline their operations, increase customer loyalty, and ultimately increase sales. Additionally, businesses would have the opportunity to accept cryptocurrency payment protocols, which is an essential feature in today's market.

In conclusion, businesses need a comprehensive application that combines all the necessary modules for their daily operations, one that is tailored for business use and is compatible with cryptocurrency payment protocols. Such an application would enable businesses to operate more efficiently and productively, thus increasing their customer base and ultimately increasing their sales.

V. PROPOSED SYSTEM

The persistent issue with most existing systems is that they have been implemented without taking into account all of the accounting requirements of a business. This has led to

a poor user experience and a lack of utility. Furthermore, these apps are designed for personal use and cannot be used for business or freelancing. Instead of reminding customers of their due payments, they are instead reminding users of their own. Although these applications do have the ability to send reminders, they lack the capability to manage, track and generate invoices in one application. Furthermore, these existing apps do not support cryptocurrency payments, a key component of modern transaction processes.

In order to overcome these issues, a new system should be implemented, one that accounts for the full range of a business' needs. This system should be able to provide a comprehensive view of the user's accounts and allow for invoice generation. Additionally, the system should be able to streamline payment processes by allowing for payments through cryptocurrency, a feature that is becoming increasingly important. Finally, the system should provide greater automation of reminders and notifications, allowing for more efficient customer service.

This system is designed to assist small businesses and freelancers in tracking, managing, and generating invoices in a single application. It seeks to help businesses and freelancers to run their operations more efficiently and be more profitable by providing an all-in-one app experience and eliminating discrepancies and errors in account management. Notifications and reminders will be sent to clients of the business to remind them of payments before their due date, saving the business time chasing payments. The user dashboard provides insights into the business' earnings and expenditure, enabling better decision making. In-app payment options are available, as well as cryptocurrency support for transactions. In economic terms, this system is cost-effective, with little development and operational costs. It is available online, making information accessible to all types of users, and the system can handle a large amount of data in a short period of time. Analysis of the project has returned positive results.
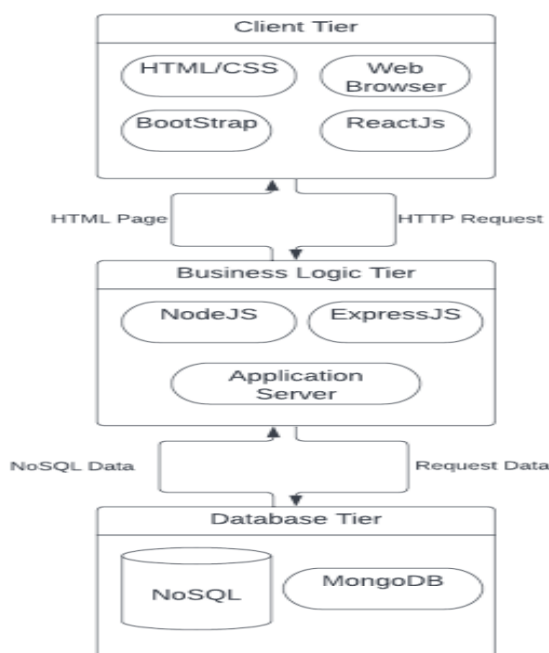

Fig. 1. Architecture of the Proposed System

VI. ARCHITECTURE OF THE PROPOSED SYSTEM

The proposed system is a 3-layer web application, which leverages the MERN stack technology stack, comprising MongoDB, ExpressJS, ReactJS, and Node.js. The application's frontend is developed using HTML, CSS, and ReactJS, whereas the backend server is crafted using Node.js and ExpressJS. The non-relational MongoDB is employed as the database to persist the application data, and the file data is stored in the highly-scalable, durable and secure cloud storage service provided by AWS, known as S3.

ReactJS provides the advantages of one-way data binding and a component-based approach, allowing for efficient and reusable code. Virtual components are rendered into the DOM, leading to a smoother and faster performance, and providing a great user experience. Node.js is used to create API gateways, and is specifically designed to support real-time web applications due to its event-driven nature.

MongoDB makes use of sharding to scale horizontally, splitting data across multiple MongoDB instances. This allows for load balancing, as well as redundancy in case of hardware failure. The 3-tier architecture ensures that the system is secure and stable, and ensures a great user experience due to the advantages offered by each of the layers.

Amazon Simple Storage Service (S3) is a highly secure, durable, and highly-scalable cloud storage service offered by Amazon Web Services (AWS). It makes managing and storing data easier and more efficient for businesses of any size. It allows users to store and retrieve any amount of data from anywhere in the world, offering data protection and security features to ensure the data is safe. S3 offers a range of access management tools, such as user authentication and encryption, to keep data secure and to ensure that unauthorized users cannot access the data.

VII. MODULES

The Dashboard module facilitates a comprehensive overview of earnings, clients, payments, and business growth under one page. This interactive page offers a convenient user experience and a concise summary of the business.
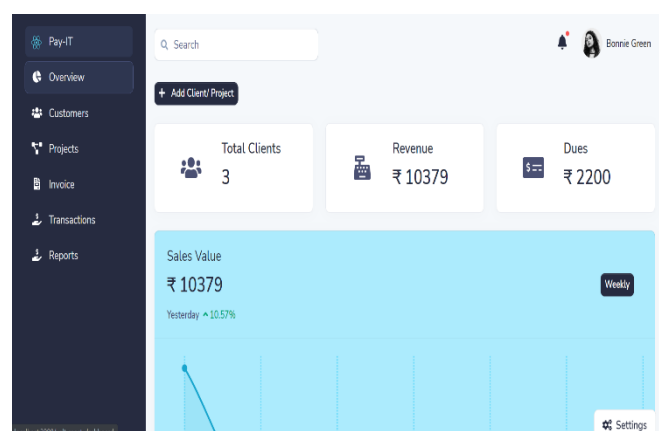

Fig. 2. Dashboard

The Invoice Generator module will allow users to create and send customized invoices to their clients via email. This

will enable them to streamline the invoice creation process and improve the efficiency of the process.

Fig. 3. Invoice Generator

Fig. 4. Generated Invoice

The Payment Reminder module is a practical solution for businesses to remind their customers of any overdue payments before the due date. This eliminates the necessity for manual emails to be sent by the firm, streamlining the whole process.

The Reports module provided to firms is a powerful tool for generating and analyzing data. It provides users with a comprehensive view of all the data and insights needed to make informed decisions. The Reports module provides a detailed picture of the company's performance, allowing users to make informed decisions quickly and accurately. It is also a great way to document results, eliminating the need for third-party applications. Furthermore, the module is designed to be user-friendly, allowing users to easily navigate and extract the data they need.

Fig. 5. Reports Module

VIII. DATABASE ARCHITECTURE

The SQL database architecture includes three tables: users, projects, and clients. The users table stores information about the users, while the clients table stores data about the clients. One interesting aspect of this architecture is the one-to-many relationship between the users table and the clients table, which means that one user can be linked to multiple clients, and each client can have only one user associated with them. Additionally, the clients table is linked to another table called projects, which also has a one-to-many relationship with the clients table. This means that one client can have multiple projects associated with them, but each project can only be linked to one client. This architecture enables efficient management and retrieval of data, resulting in a seamless user experience.
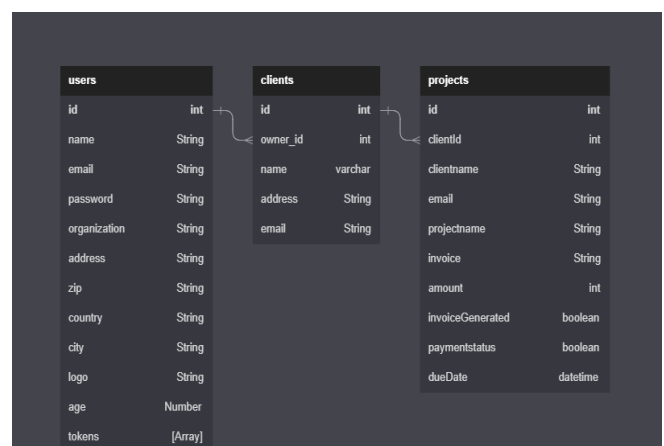

Fig. 6. Database Architecture
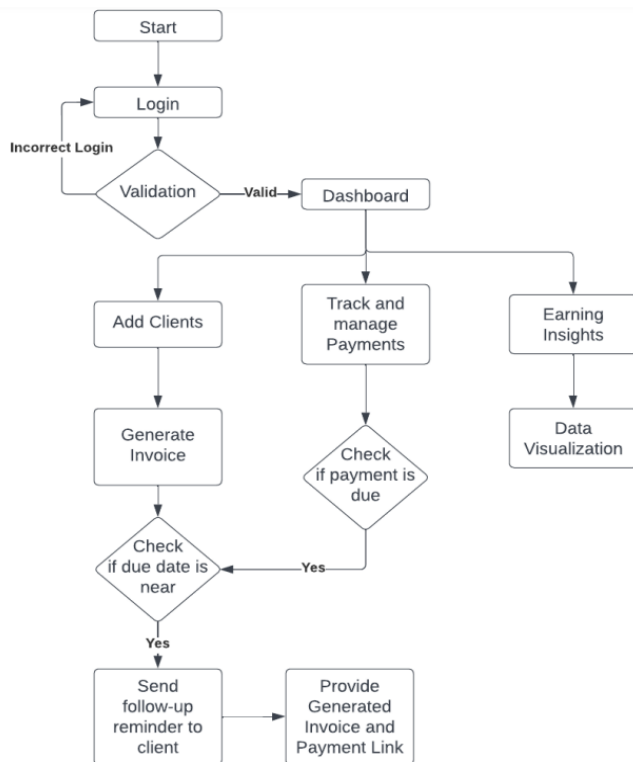
IX. PROCESS FLOW DIAGRAM

Fig. 7. Process Flow Diagram

X. CONCLUSION

In conclusion, the development of a comprehensive payment tracking and accounting application has been a highly successful initiative. The application has been meticulously crafted to cater to the specific needs of businesses, providing an optimal solution for organizations looking to optimize their operations. The application has been built using state-of-the-art technology, ensuring efficient and secure data storage, allowing users to securely store and track their financial transactions with ease.

The user interface has been carefully designed to be intuitive and user-friendly, making it easy for users to navigate and interact with the application. The interface is designed in such a way that it is easy for users to access the features and functionalities of the application, making it easy to manage their financial transactions.

In summary, this payment tracking and accounting application is an outstanding choice for any business that seeks to streamline its operations and manage its finances more effectively. The application's robust and secure architecture, coupled with its user-friendly interface, makes it an ideal solution for businesses of all sizes and industries.

This application is designed to help businesses increase their efficiency, reduce costs, and improve their bottom line.

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