

Handling Small Scale Indian Businesses using an ERP Solution

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Abstract: *An ERP software, also referred only as Enterprise Resource Planning System, has evolved into one of the most functional and beneficial deployments. ERPs are extremely capable of providing a robust institutional structure and streamlining the entire enterprise. ERPs had also grown in popularity well over previous couple years as a result to considerable cost reductions and better management of an organization's entire commercial procedures. Because of the extensive and complete interconnection, ERP maintenance is an enormously expensive process, but that's why most of that has been concentrated on large enterprises. That's also why nearly every one of these innovative concepts have remained out of budget for small and medium enterprises. Owing to the increase expense of these innovations, plenty other academics were also banned from examining them and making extensive changes. As a consequence, an efficient way for developing a complete strategy to ERP for those relating to the administration of small to medium-sized businesses is necessary. In the next parts, this scientific study gives an effective technique that allows the management and employees to employ this programs to make transactions, manage management and employee information, check achievement graphs, and so on.*

Keywords: GST verification, Pan Number Verification, Database connectivity, purchase Entries, Sales Entries

I. INTRODUCTION

This paper utilizes an Enterprise Resource Planning system, which really is equal to a suitable data business methodology. An information administration technique is a significant piece of software that is employed to administer and supervise databases. It is capable of creating, running, and upgrading databases. DBMS is an abbreviation for database management system. It can regularly evaluate and control data, ensuring the secrecy and dependability of data. Consumers could use DBMS to regulate information in a database, while database experts could use that to administer database systems. A database management system (DBMS) is a set of characteristics that allow clients or software applications to build, alter, or extract databases using various approaches at the appropriate time.

ERP solutions have been shown to be extremely beneficial in correctly organizing and improving the administration of large enterprises across the globe. These large organizations spend enormous amounts to have these technology implemented. The tremendous cost of implementation much surpasses the advantages offered by using such a system. The companies conserved a large amount of money after the deployment because they now had a well-organized replica of the current operations in effect. This has been largely targeted on large industries can corporations even though they could fund a large-scale implementation along with research and development costs.

Small and medium sized approaches also weren't acknowledged for this sort of deployment due to the price and absence of managerial framework. Because the approach is black-walled at big corporations, all significant information in this regard by scholars as well as other experts has indeed been concealed. A considerable majority of such installations have indeed been adapted to the aims and requirements of the company or organization. As a consequence, implementing such ERP systems increases the company's production efficiency even while boosting its capacity to satisfy developmental and employee retention goals.

The proposed method may be used in a variety of settings, encompassing small and midsize businesses of various kinds. This solution enables users to successfully manage their businesses and increase overall economic output. The

above system's targeted recipient are the businessman and the industry's employees. The employee will utilize this method to monitor their spending and salary, as well as any other contact with management. Managers may also handle enquiries and numerous business-related operations using this self-contained interface.

This approach will be used by the worker to track their expenditure and compensation, and just about every other communication with administration. Supervisors can also use this self-contained platform to handle inquiries and a variety of company procedures.

This strategy allows for the identification and authentication of a large variety of personnel and managers who can successfully manage the organization's activities. The staff may handle a wide range of tasks, including inputting customer information, processing financial transactions, monitoring stocks, seeing productivity graphs, and so much more. This enables a lot more effective and successful tool for significantly improving the administrative effectiveness of the company. This ERP technology will be thoroughly explained in the next parts of this research article.

Section 2 of this research piece is devoted to a review of previous studies known as a literature survey. And the established strategy is broadly discussed in the third part, proposed approach. Section 3 delves into the testing process's outcomes. Furthermore, section 5 closes this work by discussing the potential for future improvements.

II. LITERATURE SURVEY

H. Zhong [1] describes a database management system capable of handling and managing databases, as well as building, utilizing, and maintaining them. As a result, the database can be maintained and managed globally, assuring its security and soundness. The database server enables users to view the database's data. Database administrators could also utilize DDMS to keep their databases up to date. It may offer a wide range of functionality, enabling application programs and consumers to construct, modify, and search database systems at the very same moment.

S. Luo et al. introduce Boafft, a decentralized deduplication online storage infrastructure. It offers scalable speed and reliability by running multiple data deduplication across multiple datanodes with little deduplication percentage decrease [2]. First, Boafft uses an optimized and efficient routing algorithm based on data similarity, which somewhat reduces bandwidth of the network and also calculates digital storage positions quickly. Furthermore, every data server maintains a similarity table in storage, that can be used to significantly deduplicate data and minimize disc random reads/writes. Finally, the researchers use a cache container of hot fingerprints based on the access speed to maximize the data deduplication percentage on a single point.

B. Hu et al. offer a cloud-based account management approach for the SME SaaS Ecosystem and its implementation. The account service aims to deliver a multi-tenant, extensible, and transparent managed services infrastructure as a service to corporate users [3]. The suggested account service differs from current open account platforms in the following ways: 1) It will be customized as a standalone public cloud infrastructure with an emphasis on business apps, especially SaaS; 2) Multi-tenancy is completely backed, so each venture is an occupant of the account provider with defined boundaries with the other leaseholders; and 3) The underlying methodology does include a partition-based distributed approach that guarantees the provider is expandable and accessible.

S. Ramamoorthy proposes a system for accessing and modifying cloud data using blockchain approaches. This hybrid technique avoids unwanted data modification and removal in the public cloud infrastructure. The use of random hashes and a secured blockchain spanning public cloud nodes improves access to data and alteration protection. Moreover, the privacy results show that the recommended technique successfully inhibits risky usage patterns on this network. The suggested shared information accessibility structure would make use of OpenLedgers, that are managed via blockchain technology [4]. The openLedgers are worldwide tables that store information around every node in the framework, including exchanging data and information.

S. Manjula et al. [5] suggested an architecture that provides a secure approach that divides information into sections to safeguard user information over the internet. The cloud server's information division helps to prevent attackers from viewing the complete file. Moreover, even though the hacker views the stored file, he would be unable to tell which part of the document it is or what information it includes because it is encoded. With proper accreditation, safe file dissemination will be achievable. When one of the cloud storage fails, the system is supposed to recover data from the remaining cloud servers using the replicating mechanism. The file's cryptography with an irreversible technique and dividing the file safe data.



ACTOR is an active Cloud services architecture developed by Z. Qiao et al. that uses the on-drive processing capability of Ethernet-connected disks as the cognitive big data analytical and archiving alternative. ACTOR includes a large number of energy-efficient Ethernet-connected SSDs, which can help big data operations save resources and costs. Additionally, information processing adjacent to data storage enables computation and communication management chores to be delegated to Ethernet-connected equipment, resulting in enhanced parallelism [6]. This technological parallelism may have been used to process massive amounts of data provided to storage technologies by data-intensive activities. That much more data transmission may be conserved by downsizing and consolidating data before transferring it, culminating in many fewer data packets being delivered to processing cores.

S. Muthurajkumar et al [7] created an effective data storage system to conserve space. In this technology, an unique technique dubbed Temporal Data Deduplication Algorithm (TDDdA) has indeed been introduced to enhance performance. This technique emphasizes on routinely assigning and displaying management information system to individuals, while also allowing temporal constraints to boost protection. The proposed Temporal Data De-duplication Algorithm (TDDdA) is confined to two methods, one with and another with Temporal. This research has also been incorporated in a real - world environment for auditing documents and helps the system to confirm media files. Obfuscation is yet another way of guaranteeing protection which could be used in instructions to enhance performance.

K. Al Nuaimi et al. proposed a creative cloud storage optimization strategy. The major goal is to boost download speed simultaneously minimizing storage usage and costs for clouds that store large data. The coordinated dual-direction dissemination from several cloud storage, which would be based on the availability of numerous clones on the server farms, speeds up downloads. To create place for new data, the replicas' non-downloaded segments from the distant server are deleted [8]. The elimination of replica partitioning is determined by prior twin orientation downloading. For instance, a client may need to transmit a filename to the cloud, although certain cloud hosting may not have enough space to accept this file.

C. -P. Chang et al. designed and implemented a cloud backup incorporation system that will automatically adjusts to the needs of the user. The system operates as a single system files, allowing the user absolute control over his conceptual viewpoint. From the user's browser, the file information is instantaneously transferred to the cloud backup suppliers [9]. Despite the fact that this architecture has a minor expenditure, the system offers capabilities that can significantly ease the maintenance of the cloud storage services. Transferring file information to inform downloading for a file which should never be split, giving a single reasonable design that is not separated by online storage account restrictions, and distributing the reasonable view with other customers.

A. Sharma presented a NoSQL-based multi-tenant data storage architecture [10]. The data store was built using Cassandra, a column-based NoSQL family database. The proposed solution has the benefit of just being easy to offer data segregation between tenants while also allowing for customization in schema creation or update. The deployment findings show that the proposed Multitenant configuration tenants with the necessary data separation and operates well for large datasets, however query execution time increases for standard datasets.

III. PROPOSED SYSTEM

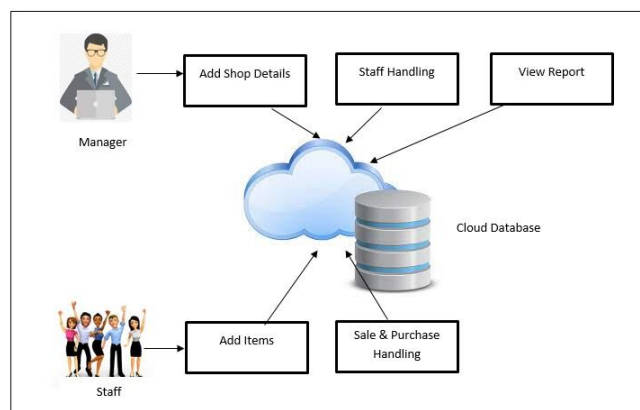


Figure 1: System overview

Figure 1 depicts the approach offered for the aim of achieving ERP or Enterprise Resource Planning system. The offered technique is made up of several actors, and the jobs that these players execute are outlined in the stages below.

The Manager has certain responsibilities as mentioned below.

- **Add Company Details:** The Manager can use the panel to visit the Home Panel and enter the home firm and its detailed details through into ERP software. Following that, the manager will input the information of the company, such as its name, address, bank details, PAN, and so on, and then click submit button to store the information. The PAN number is validated as shown in the algorithm 1 given below.

ALGORITHM 1: PAN Number Validation

//Input : PAN Number as String PSTR

//Output: Boolean TRUE or FALSE

Function: isValidPAN(PSTR)

1: Start

2: FLAG=TRUE,C1=0,C2=0

3: for i=0 to size of PSTR

4: ch= PSTR [i]

5: X=(int)ch

6: if (X>=65 AND X<=90)

7: C1++

8: else if (X>=4 AND X<=57)

9: C2++

10: end for

11: SUM=C1+C2

12: if(SUM!=10)

13: FLAG=FALSE

14: end if

15: return FLAG

16: Stop

- **Edit Company Details:** The Manager can indeed modify the Home company data by going to the Dashboard's home screen and choosing the update home business information option. The manager then edits the originally provided firm data including such company name, address, bank details, PAN Number, and so on, and clicks submit to save all the changes.
- **Add Staff:** Also on dashboard tab, the manager does have a staff button that can be utilized to add a new employee. Once that is chosen, the manager can insert the staff's information, such as name, date of birth, mobile number, and so on, and then select the save tab.
- **View and Edit Staff:** The manager may also examine the current personnel using the equivalent staff menu on the portal. By selecting the edit function, you may also modify the information of a current member of staff.
- **View Staff Report:** The manager may also modify the staff report by selecting it from the management dashboard. The report includes all of the employees' access and check out information that will be provided to the management.
- **View Sale Graph:** The manager can enter the sale charts via the report button. The sale graphs show the sale of specific elements with the quantity in INR in the manner of a bar chart. The chart appears in a new tab, which may be dismissed after reviewing.
- **View Purchase Graph:** The manager may examine the purchase statistics via the report page. The purchase chart shows the acquisition of things with the value in INR in the format of a bar chart. The graph appears in a new tab, which may be dismissed after reviewing.

The CEO performs certain responsibilities as mentioned below

- **View Sale Graph:** The CEO can enter the sale charts via the report button. The sale graphs show the sale of specific elements with the quantity in INR in the manner of a bar chart. The chart appears in a new tab, which may be dismissed after reviewing.
- **View Purchase Graph:** The CEO may examine the purchase statistics via the report page. The purchase chart shows the acquisition of things with the value in INR in the format of a bar chart. The graph appears in a new tab, which may be dismissed after reviewing.

The Staff performs certain responsibilities as mentioned below

- **Add Client:** The employees can add clients to enable the buying and selling of items. The user navigates to the handle client tab and selects the add client selection to reach the add client screen. On this section, the staff inserts all necessary client information, including such general information and statutory information. Bank information and contact information are entered, and afterwards the save button is pressed.
- **Search Party:** The employees may also examine the information of the inputted customers, which are accessible via the searching client detail function. The search term can be given to search the current clients; also there are choices on this screen to add new parties and update current clients.
- **Edit Client/Party:** This feature allows staff to make changes to formerly registered customers or parties. The modify client feature allows personnel to change all of the client's pertinent characteristics, such as basic information and statutory data. Bank and contact information, then click the save button to store the information.
- **Add Item:** Staff members can add things that can be utilized for purchase and selling. This is accomplished by selecting the add item selection from the manage item menu. The Add item option allows the employees to add necessary details regarding the products, including such type, item name, product description, quantity, GST rate, and HSN number, before clicking the Store button to save the information.
- **HSN Code Selection:** The HSN selected based on the following for Harmonized System of Nomenclature, which has traditionally been used for product categorization. This approach enables an efficient categorization of commodities that is internationally recognized. The package incorporates a repository that can be utilized to perform a more efficient searching for the HSN product id that can be picked by pressing the choose button.
- **Search Item:** The staff may also use the search item feature to look for previously uploaded things. The staff may add a new item via selecting the add item button, or the users can alter the currently selected item by pressing the edit function.
- **Edit Item:** The update item screen enables staff to edit already submitted item characteristics including such type, item name, product description, quantity, GST Rate, and HSN code before clicking the save button and save the changes.
- **Stock Register:** The staff has accessibility to the inventory registration, which enables them to see different products and the inventory that is presently accessible. The stock may be collected by selecting the download option, which generates an excel sheet which can be saved to the destination of your choice.
- **New Buy:** The staff is responsible for entering any new purchases into the purchase tab using the new purchase option. The staff subsequently inserts the purchase's important facts, including the search party, buy type, cost center, sale ref, invoice number, invoice date, and purchase order number. Payment period in days, item name, quantity, price, discount, transport costs, packing charges, and then save the transaction by clicking the button.
- **Search Buy:** The staff may also use the search purchase area to look up initially made purchases. To narrow the query results, the staff must input the correct search phrase or date range. The results of the search may then be saved in a worksheet form by selecting the download link beneath. The items on this section can easily be erased by clicking the delete button.
- **Payment Status for Past Transactions:** Staff may also look up the payment history for previous customers. The staff can refine this listing by entering the client's identity and payment state, including such payable, payment done, or partial payment. The staff can also choose a timeframe to narrow down the outcomes. The

findings may be obtained by selecting the download button, and modifications can be saved by selecting the save button.

- **Advance Payment:** Staff can also use the option to make advance payments for new purchases. This is accomplished by using the advance payment method and entering the information in the form of the name of the client/party, the amount paid, date of payment, mode of payment and the description. These particulars may then be preserved by selecting the save button.
- **New Sale:** The staff is responsible for documenting any new sales using the new sale selection on the sale page. The staff then inputs the sale's pertinent information, such as the search party, purchase type, cost center, sale ref, invoice number, invoice date, and purchase order number. Payment period in days, item name, quantity, price, discount, transport costs, packing charges, then save the transaction by clicking the button.
- **Search Sale:** The employees may also use the search sales area to look up prior sales. To narrow the search results, the staff must input the correct search phrase or date range. The results of the search may then be saved in a worksheet form by selecting the download button underneath. The items on this section can easily be erased by clicking the delete button.

IV. RESULTS AND DISCUSSIONS

To build an effective Enterprise Resource Planning solution, the suggested technique employs the Java programming language and the NetBeans IDE. The developer laptop comes with a Windows operating system, an Intel core i5 CPU with 8 GB of RAM, and 500 GB of internal capacity. The MySQL database is in control of database administration.

The suggested method has been thoroughly evaluated for effectiveness over a wide range of operating conditions. The experimental report's conclusions are described below.

Scalability Analysis of Database Transactions

The suggested strategy for an Enterprise Resource Planning methodology is used to estimate the scalability of data processing. An intensive research is being conducted for this purpose, which involves the implementation of the ERP system comprises of three distinct logins and other organization-related data saved on the platform. The density of database transactions documented and showcased is shown in Table 1.

| S. No | No. of Database Transactions | Time Taken (in Seconds) |
|-------|------------------------------|-------------------------|
| 1 | 256 | 0.512 |
| 2 | 541 | 1.005 |
| 3 | 801 | 1.764 |
| 4 | 965 | 2.004 |
| 5 | 1299 | 2.217 |

Table 1: Blockchain Transaction Time Estimation Table

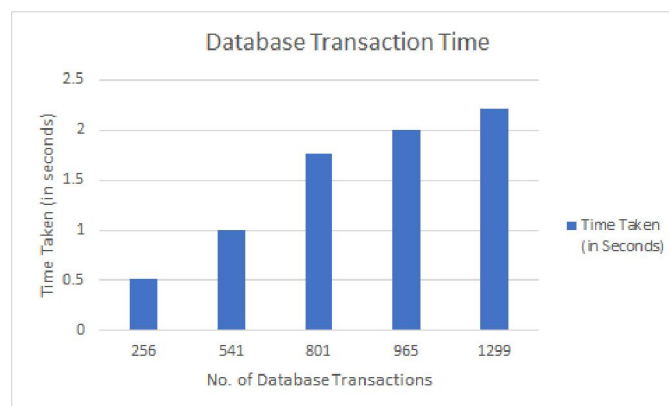


Figure 2: Blockchain Transactions

The tabulated data is then utilized to produce the graph seen in Figure 2. The graphical depiction has been demonstrated to be successful in displaying the link between the wide range of operations and the time required to complete those on the MySQL Database. The results of this study improve comprehension of the technology and usage of the MySQL Database to ensure effective data storage and management for the company. The velocity with which Database operations are performed is certainly not proportionate to the time required to complete the operation. This confirms that the MySQL storage method was used correctly. The data helped to a deeper comprehension of the ERP system's increased endurance.

V. CONCLUSION AND FUTURE SCOPE

This research study elaborates on the given ERP system for the administration and organization of medium size enterprises or businesses. The technique has been created to make enrollment and login easier for three main categories of users. The CEO, Manager, and employees are among those with logins. The CEO does have the fewest use cases, with access to only progress reports in the manner of purchase and sales charts. The Manager is in charge of implementing the staff login, in which the manager initiates the employees by supplying the necessary information. The manager could also add new businesses and edit those that have already been incorporated. The management may also examine the staff summaries to keep track of the work getting done by the employees. The manager could also see statistics of purchases and sales. The staff can handle the most use cases, such as registering a customer.

This solution may be improved in the future to function in a real-time cloud infrastructure to reside in an Amazon database utilizing RDS. This system can also be established as a smartphone application as well as a centrally controlled local host web based application to assist small and medium enterprises in managing ERP through several workspaces.

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