Minature Resource Planner

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Abstract

Due to the complexity and high cost of typical Enterprise Resource Planning (ERP) systems, medium-sized enterprises (SMEs) often face challenges in their implementation. To address this, the article develops a tailored, cost-effective ERP system specifically designed for SMEs, considering their unique needs and limitations. The research analyzes existing ERP systems in large organizations and conducts surveys and interviews to identify common issues faced by SMEs when adopting standard ERP systems. The paper's main goal is to create an affordable and user-friendly ERP system that empowers SMEs to overcome financial obstacles in an increasingly digital world. The system addresses key business processes such as financial accounting, employer management, and procurement. Additionally, the report highlights the interest homeowners have in using ERP systems for household tasks, indicating a substantial market and demand. Emphasizing the importance of a flexible Home Resource Planning (HRP) system, the study aims to design a cost-effective ERP solution suitable for both homes and SMEs. The proposed ERP system's impact on SME operating performance, productivity, and decision-making is thoroughly examined. The conclusion underscores the significance of customized ERP systems for homes and SMEs in the current digitized environment. The developed small-scale ERP system proves successful in helping SMEs and homes overcome financial challenges and reach their full potential.

Keywords: SMEs, Resource Planner, ERP

1. Introduction

Organizations nowadays are trying to attain optimal efficiency, get an edge over their competitors, and accomplish their objectives as quickly as possible. ERP, or enterprise resource planning, aids in achieving previous corporate goals. As a definition, ERP is a piece of software that contains all the components necessary for a corporation to be managed and operated with maximum effectiveness, avoiding the most possible issues. Enterprise resource planning works by integrating technology from many industries—including human resources, finance, manufacturing, supply chain, and more—in one environment. In other words, it automates numerous business processes with the least amount of effort while remaining in the same setting. Most large businesses globally have already embraced ERP, and more and more small and medium-sized businesses are trying to do the same to compete; they find it both cost-effective and necessary to keep pace [1]. Although the scope and close integration of ERP has only just become available, the market for ERP has been expanding quickly, with more customers and users on a daily basis.

Any firm may gain a lot from using an ERP system. For instance, it can improve and automate the majority of daily tasks an organization must do by removing the need for human data entry, saving time and money [2]. Second, ERP keeps everything organized and in a single system, which removes the need for numerous technologies. Third, ERP can quickly analyse and identify the saved data to provide managers with operational insights. Overall, enterprise resource planning provides seamless data flow between any organization's sectors while maintaining customizability so that it can follow the business needs and strategies.

It has become a must for the future of any establishment that is looking to improve and remain on the popular side of the market [3]. Throughout this proposal, a deeper analysis of the significant characteristics, challenges of implementation, and difficulties related to ERP systems will be done to ultimately gain a thorough understanding of their

function in promoting organizational success. also mentioning some issues and their solutions, using my approach to resolve them, and expanding the accessibility of ERPs to everyone, without exception.

2. Methodology

2.1 Brief History

ERP history traces back to the 1960s with material requirements planning (MRP) systems, pioneered by J.I. Case in collaboration with IBM. The increasing complexity of workplaces led to the need for cross-functional data flow in areas like decision-making, product ordering, inventory management, accounting, human resources, and distribution. This complexity gave rise to the first ERP system, aimed at consolidating diverse functions into a unified platform. ERP systems emerged commercially in the late 1980s and early 1990s, initially designed for the demands of large, complex organizations. Recognized for their complexity and high costs, ERP systems have evolved over time [4].

2.2 Existing System In The Market

SAP ERP, by SAP, a leading corporate software solutions provider, automates key business operations like accounting, sales, and human resources. SAP ECC, the main component, handles transactions, reporting, and integration. SAP S/4HANA, the latest version, offers real-time data processing and improved analytics. Known for a well-explained UI, SAP ERP is popular among giants like PayPal and NBA. Recently integrated with cloud capabilities, SAP ERP provides a customizable cloud solution for global business models and revenue growth [5].

Oracle ERP, from Oracle Corporation, optimizes finance, supply chain management, and human resources. Renowned for dependability and scalability, it suits both small and large businesses. Oracle ERP is customizable to meet industry needs and offers extensive capabilities in data analytics, reporting, and system integration. With a solid reputation and broad support services, Oracle ERP has been a market leader for over a decade.

Microsoft Dynamics 365, part of Microsoft's business application package, is a popular ERP system. It covers accounting, supply chain management, sales, and customer support. Unique for seamless integration with Microsoft products like Office 365, it provides a consistent user experience. Microsoft Dynamics 365 ERP offers advanced analytics, AI-driven insights, and cloud-based deployment options, facilitating operational growth, insights, and automation.

Odoo ERP, an adaptable open-source system, is among the fastest-growing ERP systems. It offers tools for accounting, manufacturing, and sales. Odoo's uniqueness lies in its modular approach, allowing organizations to integrate only the required modules. With an approachable UI, community-driven ecosystem, and cloud-based options, Odoo is an affordable and scalable solution for businesses of all sizes and sectors. Known for fitting SMEs, Odoo is simple and free to test for new users.

2.3 ERP Benefits

Streamlined Operations: Streamlined operations are achieved through the reduction of delivery and cycle times, strategically minimizing delays in data retrieval and reporting. By optimizing these processes, the organization enhances overall efficiency and responsiveness, contributing to a more agile and competitive operational framework.

Cost Reduction: The realization of cost reduction stems from a comprehensive, enterprise-wide review of organizational decisions. This holistic approach not only saves valuable time but also enhances control over financial aspects. Through the identification and elimination of inefficiencies, the organization not only achieves monetary savings but also establishes a more robust and cost-effective foundation for future endeavours.

Adaptability and Flexibility: The system's inherent adaptability and flexibility empower the organization to undergo simple reorganization swiftly. This adaptability extends to accommodating modifications in business processes, ensuring that the enterprise remains agile in response to evolving market dynamics. This capability becomes a cornerstone for sustained innovation and resilience in an ever-changing business landscape.

E-Commerce and E-Business Integration: The system seamlessly supports online shopping experiences and fosters a collaborative environment conducive to effective teamwork. This collaboration, in turn, enables effortless integration with e-commerce systems. By embracing and facilitating digital interactions, the organization not only capitalizes on the growing trend of online commerce but also positions itself for enhanced connectivity and synergy across various aspects of its e-business operations.

2.4 ERP Drawbacks

Time-consuming deployment, the time and resources required to accomplish an ERP deployment are frequently considerable [6]. The collecting of requirements, system configuration, data migration, testing, and user training all need resources from organizations.

Organizational disruption can result from the implementation phase, which forces staff members to become used to new procedures and systems. Employee

reluctance to change and temporary productivity declines may result from this shift.

Challenges with complexity and customization, because of their extensive nature, ERP systems may be very complicated. Adapting the system to a given organization's requirements can be difficult and may call for advanced technical knowledge.

2.5 ERP In Different Industries

Healthcare Industries: ERPs are pivotal in healthcare, streamlining processes like patient scheduling, inventory control, and invoicing. Key benefits include increased operational effectiveness and compliance with healthcare data protection laws like HIPAA.

Financial Sector: In finance, ERPs are indispensable for managing financial data, reducing data loss risks, and ensuring compliance with industry laws, emphasizing the importance of rapid and secure access to accounting information [7].

Education Sector: ERPs play a vital role in education, simplifying tasks like resource organization, grading, and student enrollment. They provide colleges and schools with seamless support for effective operations.

Manufacturing Industries: In manufacturing, ERP systems prove invaluable throughout the workday, efficiently managing logistics, invoicing, and ensuring data organization [8]. Beyond these functionalities, they also assist employees in maintaining accessible personal data, highlighting the depth of their capabilities.

2.6 Comparison Table

Table 1 shows the comparison of the ERP providers.

Table 1. ERP Comparison Table

ERP Provider	Odoo	Microsoft 365	Oracle	SAP
Deployment	On-premises, Cloud	On-premises, Cloud	On-premises, Cloud	On-premises, Cloud
Open source	Yes	No	No	No
Customization	Highly	Moderate	Moderate	Moderate
Scalability	Yes	Yes	Yes	Yes
User-Friendly	Yes	Yes	Yes	Yes
Cost-effective	Yes	Varies	Varies	Varies
Popularity	Growing	Popular	Popular	Popular
Community	open	Strong	Active	Active

2.7 ERP Implementation

When implementing an ERP system, a comprehensive plan is crucial. It begins with a detailed requirements analysis to identify organizational issues and objectives. Vendor selection follows, involving research to choose an ERP provider that aligns with the organization's needs. Project planning outlines the implementation schedule, resource allocation, and key tasks after vendor selection. Configuration and customization of the ERP system to match unique requirements and procedures follow, including data transfer with accuracy. User training introduces the new system through sessions, workshops, and documentation. Testing and quality control ensure functionality, with various tests like user acceptability and functionality testing. Upon readiness, the system is deployed, with ongoing support to address user queries. Continuous improvement is emphasized, with regular monitoring and feedback collection for streamlined procedures.

2.8 Quantitative Methodology

Data collection involved in-depth interviews and organized surveys to gather user and stakeholder insights. Surveys targeted user groups, focusing on quantitative aspects like performance indicators, system usability, and user satisfaction. A comprehensive analysis of comparable ERP systems enriched contextual knowledge, dissecting and comparing various systems to understand ERP dynamics. The investigation explored the advantages, disadvantages, and unique features of existing ERPs for designing and developing the Home Resource Planning (HRP) system.

2.9 Survey Structure

The survey comprised two parts. The first assessed respondents' ERP knowledge, experience, and understanding of fundamental features. The second part delved into comprehensive testing methods, evaluating the system's stability, performance, and user satisfaction in challenging circumstances. Survey sections included Knowledge and Familiarity with ERP, HRP Interest, ERP Experience, Future ERP Use, and an Additional Comments section for open-ended feedback.

2.10 Qualitative Methodology

Qualitative methods, including interviews and personal comments, supplemented statistical approaches for a holistic understanding. One-on-one interviews covered participants' experiences with ERP systems, potential benefits of an HRP system for daily tasks, and desired features. Questions focused on familiarity with ERP systems, willingness to use an HRP system, valued features, anticipated impacts, and challenges faced with ERP systems in the past.

3. Implementation

3.1 Functional Requirements

User registration and authentication: Users are able to set up accounts with distinctive passwords and

usernames. During the login process, the system authenticates and verifies the user's credentials.

User-Specific Views: Based on their role and preferences, every user is shown a customized dashboard or view. The interface is customized by the system to provide appropriate information, including appointments, finances, people, and duties, for various users.

Service Selection: A variety of services are available for users to select from, such as appointment scheduling, money, personnel management, and chore organization.

Data Entry and Management: Within the service category they have chosen, users can enter and manage data. To ensure data accuracy, the system offers capabilities for data entry, modification, and deletion.

Notification and Reminder System: Users are able to choose how they want to be notified and reminded. Reminders and automatic notifications are sent by the system in accordance with user-specified schedules and actions.

Data Integration: Users may access and use information from several modules by means of the ERP system's smooth integration of data from the other services. Maintaining data consistency helps to guarantee accuracy and dependability.

3.2 Non-Functional Requirements

Security: To safeguard user data and preserve privacy, the ERP system complies with industry-standard security standards. Sensitive data is protected by robust encryption and authentication processes.

Scalability: Exhibits the capacity to increase with the number of users and volume of data. meets predetermined performance goals and maintains peak performance as the system grows.

Performance: Reduces downtime and guarantees quick user request responses. Supports several users concurrently and effectively handles data transfers without appreciable performance reduction.

Usability: The design of the user interface places a high value on simplicity and clarity, making it easy for users to navigate and finish activities.

Dependability: An ERP system with high dependability has fewer mistakes and interruptions.

3.3 Web-based Resource Planner

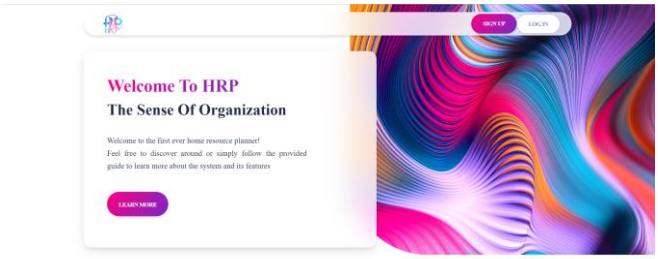

Fig 1. HRP Home-Page

The Homepage in Home Resource Planning (HRP) is an intuitive user interface that offers a smooth sign-up or log-in process for current users (Fig. 1). The design places a high value on simplicity, guaranteeing users a seamless onboarding experience. Furthermore, the platform provides a brief yet useful feature summary, enabling customers to rapidly understand the possibilities it provides. A dedicated "Learn More" page offers a thorough examination of the web application for individuals looking for more specific details. This page functions as an in-depth manual, providing information on the features, and advantages.

Fig 2. HRP Home-Page Responsiveness

It's also important to note that the majority of its pages adjust to the screen size, even on mobile devices. Whether on a laptop, tablet, or desktop, HRP will try to adjust the size to fit the screen (Fig. 2).

Fig 3. HRP Main Page

Similar to the home page, the system home page is simple to navigate; users may select the service they want to use here as shown in Fig. 3.. Additionally, the header and footer are always there and allow users to

select from the services offered on each page. At this point, it is worth noting that the purpose of HRP is to provide similar services any ERP can but with easier navigation.

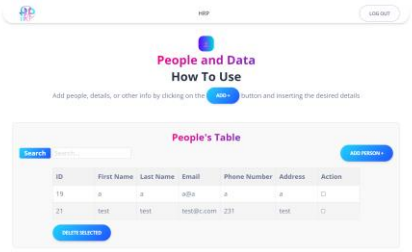

Fig 4. HRP Services

One of the features offered by the web-based app is the ability for users to add individuals to the database, modify or remove their information, or even look for a specific record as shown in Fig. 4.. Each record has a unique ID to help with identification, and each user will see their data in a unique way, guaranteeing that each user's data is private and personal.

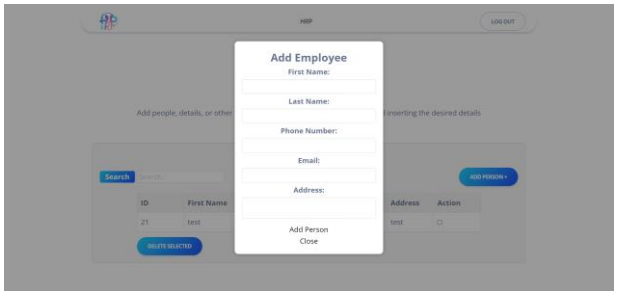

Fig 5. Pop-ups and Forms

The user will always be informed if an activity was successful or not with pop-up pages and messages that appear after any action (Fig. 5). In any online application, error management is Considered one of the most important features for a web-app/website to have.

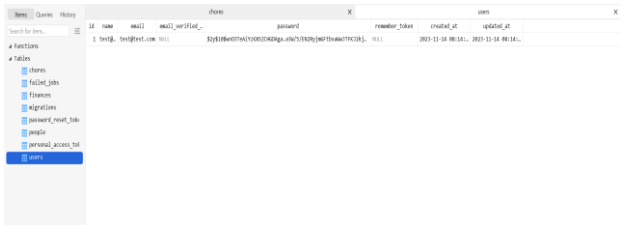

Fig 6. Database Schema

The ERP system's database is distinguished by advanced development and maximum functionality. With a strong performance, it effectively organizes and maintains large amounts of data, which adds to the system's overall dependability and efficiency. Because the database is designed to be scalable, data can be stored and retrieved quickly, guaranteeing a flexible and responsive system. Its challenging architecture creates a safe and organized space for the archiving and retrieval of vital corporate data while accommodating the various needs of ERP modules (Fig. 6). The smooth functioning of the database is essential to the overall effectiveness and success of any ERP system.

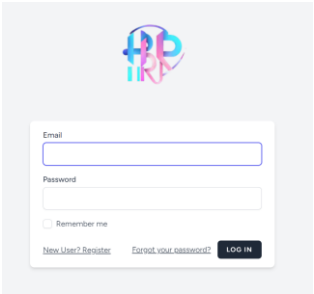

Fig 7. User Authentication

Since HRP uses user authentication (Fig. 7), that allows each user to have their own view which will allow data to be secure and no mix-ups can happen between users.

4. Conclusion

As a result of their ability to offer a centralized system that unifies several company processes such as supply chain management, manufacturing, finance, and human resources—resource planners are incredibly helpful to businesses. They have been becoming more popular by the day owing to their utilization in the business world. Small firms can increase their productivity and efficiency considerably by using an ERP system, but it does require careful design, sufficient funding, and good user support and training. A number of other implementation-related aspects are covered, such as small business owners' as well as homeowners' interest in utilizing such a system, their familiarity with ERP software, and their long-term goals for system adoption or upgrades. The analysis also showed that different small business owners have different long-term plans for adopting or upgrading their systems; some want to move to more simple solutions, while others would rather learn more about them in general.

Additionally, Homeowners' interest in utilizing an ERP system for household tasks is also emphasized. The research revealed a significant market and need for such systems, with over 80% of participants expressing a strong interest in an HRP system designed for duties connected to the household. In order to satisfy the needs of a diverse variety of customers with a wide range of user requirements and expectations, the research highlights the significance of having an adaptive and versatile HRP system.

Introducing HRP to the market and matching it with the current trends might have a lot of benefits for homes and company owners alike, as well as for anyone looking to improve efficiency and organization in their everyday lives. An HRP system is a promising addition to homes and small enterprises, with the potential to revolutionize resource management.

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