

## Cloud-based ERP System Implementation: A Strategic Investment for Business growth

G. Bharat<sup>1</sup>, SK. Habimunnisha<sup>1</sup>, T. Navyasri<sup>1</sup>, SK. Nadeem<sup>2</sup>

UG Students, Dept of CSE, Kallam Haranadhareddy Institute of Technology, Andhra Pradesh, India.

### ABSTRACT

The implementation of cloud-based enterprise resource planning (ERP) systems has become a strategic investment for businesses looking to achieve growth and competitiveness in today's fast-paced digital economy. Cloud-based ERP systems offer a range of benefits, including lower implementation costs, scalability, flexibility, and improved collaboration and data accessibility. This paper presents a comprehensive analysis of the advantages of implementing a cloud-based ERP system, as well as the challenges that organizations may face during the implementation process. The paper also discusses the key success factors for a successful implementation of cloud-based ERP systems, including careful planning, user training, and effective change management. Finally, the paper highlights the potential long-term benefits of a cloud-based ERP system implementation, including improved operational efficiency, reduced costs, increased customer satisfaction, and enhanced organizational agility.

**Keywords:** Cloud-based ERP system, Strategic investment, Implementation, Planning, User training, Operational efficiency, Cost reduction, Process Automation.

### 1. INTRODUCTION

In today's digital age, businesses are constantly looking for ways to gain a competitive edge and achieve sustainable growth. One of the most significant investments that businesses can make is the implementation of a cloud-based Enterprise Resource Planning (ERP) system. A cloud-based ERP system offers a range of benefits, including lower implementation costs, scalability, flexibility, and improved collaboration and data accessibility. However, the implementation of a cloud-based ERP system is not without its challenges. This paper presents a comprehensive analysis of the key success factors of implementing a cloud-based ERP system, with a focus on how it can serve as a strategic investment for business growth. The paper also discusses the potential long-term benefits of a cloud-based ERP system implementation, such as improved operational efficiency, reduced costs, increased customer satisfaction, and enhanced organizational agility. Overall, this paper provides valuable insights into the strategic importance of cloud-based ERP system implementation and offers practical guidance for organizations considering this investment.

ERPs are cross-functional and enterprise wide. All functional departments that are involved in operations or production are integrated in one system. In addition to manufacturing, warehousing, logistics, and information technology, this would include accounting, human resources, marketing and strategic management.

Enterprise resource planning software offers single system solutions that integrate processes across the business. Users can communicate with one another through a single interface, exchange information, and enable cross-functional collaboration. An ERP application also makes it easier for various teams to



collaborate and exchange knowledge with the rest of the organization. It gathers data on the operation and condition of various divisions and makes it available to other sections so that it can be used productively.

**Related Work:**

There is a growing body of literature on cloud-based ERP system implementation and its impact on business growth. Several studies have examined the benefits of cloud-based ERP systems in terms of increased operational efficiency, improved decision-making, and enhanced collaboration among stakeholders. For instance, a study by Hong and Kim (2019) found that cloud-based ERP systems can help companies improve their supply chain management and reduce their inventory costs. Another study by Yousaf and Asif (2020) highlighted the importance of effective change management and user training in ensuring the success of cloud-based ERP system implementation. Other studies have explored the challenges associated with cloud-based ERP system implementation, such as data security, data migration, and integration with existing systems. For example, a study by Babu et al. (2019) identified the need for proper planning and risk management in addressing these challenges. Similarly, a study by Prasad et al. (2018) emphasized the importance of selecting the right cloud provider and evaluating their service-level agreements to ensure data security and compliance.

In addition to academic studies, there is also a wealth of industry reports and case studies that provide valuable insights into cloud-based ERP system implementation. For instance, a report by Gartner (2020) noted that cloud-based ERP systems are becoming increasingly popular among small and medium-sized businesses due to their affordability and flexibility. The report also highlighted the importance of selecting a cloud provider with a strong track record of reliability and security. Moreover, there are several case studies that demonstrate the positive impact of cloud-based ERP system implementation on business growth. For example, a case study by Microsoft (2021) highlighted how a manufacturing company was able to improve its supply chain management and reduce costs by implementing a cloud-based ERP system. Another case study by Oracle (2020) showcased how a retailer was able to enhance its customer experience and increase sales by implementing a cloud-based ERP system.

However, despite the increasing popularity of cloud-based ERP systems, some businesses remain hesitant to make the switch. This may be due to concerns about data security, compliance, and the complexity of the implementation process. Additionally, some businesses may be reluctant to disrupt their existing systems and processes, which can lead to resistance from employees and stakeholders. To address these challenges, organizations considering cloud-based ERP system implementation should conduct a thorough cost-benefit analysis and develop a detailed implementation plan. This plan should include a comprehensive risk management strategy, a clear communication plan, and a robust change management strategy. It is also important to involve all stakeholders in the implementation process and provide them with adequate training and support.

Furthermore, organizations should carefully evaluate cloud providers and their service-level agreements to ensure data security and compliance. They should also consider the scalability and flexibility of the system to accommodate future growth and changes in business needs. In conclusion, the related work highlights the strategic importance of cloud-based ERP system implementation for business growth and competitiveness. It provides valuable insights into the benefits, challenges, and key success factors of such an investment, as well as concrete examples of its impact. Organizations considering cloud-based ERP system implementation should carefully evaluate their options and develop a detailed implementation plan to ensure a successful transition.



Overall, the related work demonstrates the growing importance of cloud-based ERP system implementation as a strategic investment for business growth. The literature highlights the benefits and challenges of such an investment and offers valuable insights into key success factors, such as careful planning, effective change management, and user training. Moreover, industry reports and case studies provide concrete examples of the positive impact of cloud-based ERP system implementation on business growth and competitiveness.

## 2. LITERATURE SURVEY

The implementation (project) phase of an ERP system lifecycle begins after the system and the implementing partner have been chosen, and ends after the system “go-live” [Lech, 2013]. It involves all of the activities necessary to make the selected system operational in a given organization. Although the implementation phase is the most researched topic in the ERP system lifecycle, papers detailing the implementation and the activities performed during the implementation are scarce [Eden et al., 2014]. The studies that have presented the implementation phases in a comprehensive way are presented in table 1.

(1) Ahituv et al. [2002]	(2) Bajwa et al. [2004]	(3) Esteves et al. [2003]
<p><b>Design:</b></p> <ul style="list-style-type: none"> <li>-Definition of scope</li> <li>-Establishing implementation teams and timetables</li> <li>-Training of the implementation teams</li> <li>-Initial implementation of the system</li> </ul>	<p><b>Preparation:</b></p> <ul style="list-style-type: none"> <li>-Definition of scope</li> <li>-Establishment of implementation teams and timetables</li> <li>-Training of implementation teams</li> <li>-Initial prototyping</li> <li>-Determination of implementation approach</li> </ul>	<p><b>Project Preparation:</b></p> <ul style="list-style-type: none"> <li>-Definition of project objectives and scope</li> <li>-Preparation of project plan</li> <li>-Definition of project team</li> </ul>
<p><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>--Gap analysis</li> <li>--Business process reengineering</li> <li>--Identification of complementary solutions</li> <li>--Construction of prototype</li> </ul>	<p><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>--Detailed gap analysis</li> <li>--Business process reengineering</li> <li>--Identification of complementary solutions</li> <li>--Construction of prototype</li> </ul>	<p><b>Business Blueprint:</b></p> <ul style="list-style-type: none"> <li>--Detailed documentation of the organizational structure and business processes</li> <li>--Scope adjustment</li> </ul> <p>Realization:</p> <ul style="list-style-type: none"> <li>--System configuration</li> </ul>



<ul style="list-style-type: none"> <li>--Data conversion</li> <li>--Definition of work procedures</li> <li>--Full implementation of the system</li> <li>--Training of users</li> <li>Acceptance tests</li> </ul>	<ul style="list-style-type: none"> <li>--Data conversion</li> <li>--Clarity of work procedures</li> <li>--Full implementation</li> <li>--User training</li> <li>Acceptance tests</li> </ul>	<p>Final preparation:</p> <ul style="list-style-type: none"> <li>--Testing</li> <li>--User training</li> <li>--Cut over activities</li> </ul>
<p><b>Operation:</b></p> <ul style="list-style-type: none"> <li>--Establishing of support centers</li> <li>--Performance of changes and enhancements</li> <li>--Upgrading the system audit</li> <li>--System termination</li> </ul>	<p><b>Operation:</b></p> <ul style="list-style-type: none"> <li>--System use</li> <li>--Maintenance</li> <li>--Business integration</li> </ul>	<p><b>Go-live and support:</b></p> <ul style="list-style-type: none"> <li>--Move from pre-production to production environment</li> <li>--Support organization set up for end-users</li> <li>--System performance Improvement</li> </ul>

Best of breed is an ERP implementation strategy which involves implementing different software packages, for different functions. The packages are linked to one another through programming interfaces but may not share a common database. According to Miranda (1999), this decreases the risk of overall failure (i.e., sub-par performance of one software system does not lead to all of the systems' failure), and the overall functionality is greater (i.e., the "best" individual applications are being moulded into one system). The disadvantage is that the strategy at most produces simulated ERP because there is not one shared database and there could be repetitive data entry. Koch et al. (2001) referred to this.



### 3. PROPOSED SYSTEM

In the previously implemented ERP systems, we found out some gaps in the implementation process. So a new ERP system is proposed to overcome the drawbacks of the existing ERP systems. The features of the proposed ERP system are discussed as follows.

A merged ERP system is implemented on a cloud network, so that it can be easily accessible to firm resulting in the reduction of start-up and hardware costs of the firms.

A hybrid approach is followed to implement the ERP system which not only fulfils the specific need of an organization but fulfils all the needs of an organization or start-ups.

Impacting parameters for ERP project model considering secure models through cryptography applications i.e., many algorithms like modular RSA or DES or any analytical substitution methods can be imposed so that operation model can be kept safe and secured from any threat.

Cloud computing entrance made a complete change in enterprises or organizations using ERP systems. ERP moved to cloud ERP because of its improvements, benefits, and flexible system features. Cloud ERP is an approach to enterprise resource planning that use cloud computing platforms and services to make business process transformation more flexible. In this approach there are three important layers that do cloud services which are Infrastructure as a service (IaaS), Platform as a service (PaaS), Software as a service (SaaS), and Hardware as a service (HaaS). There are other terms that are used nowadays to name difference resources provided as a service in the cloud such as XaaS.

The benefits of the proposed ERP system are discussed below.

The ERP system proposed can be easy accessible because it is implemented and hosted on a cloud network. The ERP system proposed reduces hardware costs of the organization. The ERP system proposed not only fulfils the specific need but fulfils all the needs of a firm or organization. Data security is provided by using encryption and security algorithms like RSA and DES. The System shall have a common database core which allows integration of data and transactions between all financial, operational, production, and customer service functions within the ERP System.

The System shall have a graphic user interface (GUI) implemented either as a Web-based interface (preferred) or as a Microsoft Windows client program. The System shall run on client PCs that are using Windows 10 or newer operating systems. The System shall use Microsoft Office 2010 or newer productivity software for any ad hoc data or file exchanges. The System shall have administrator ERP System and user security functionality to include:

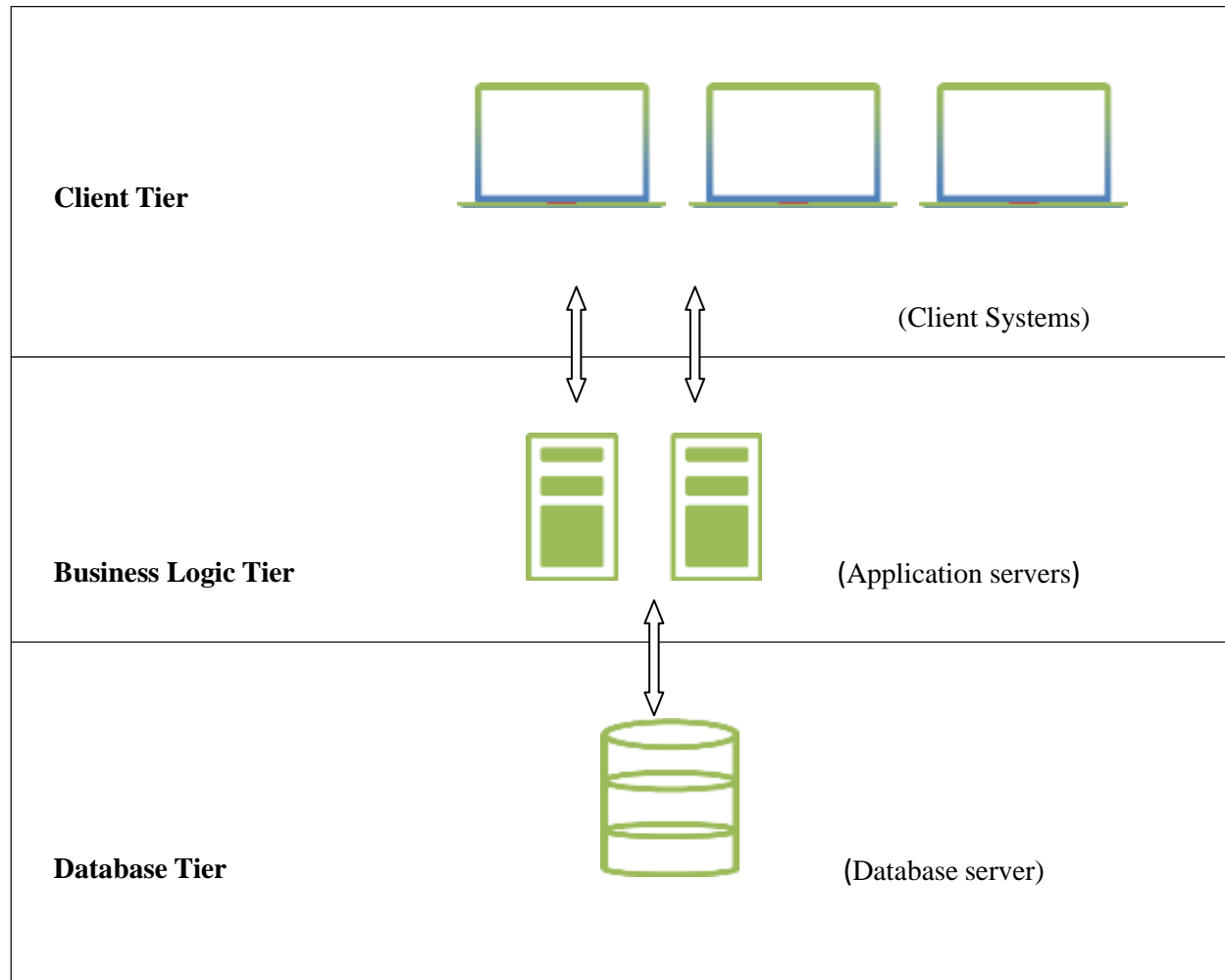
- a. Setting up a New User
- b. Updating an Existing User (name or address)
- c. Restricting User Access to Certain Roles



**System Architecture:**

Three-tier ERP architecture was introduced as a solution for two-tier ERP problems. It consists of three layers such as Presentation layer (Graphical User Interface (GUI)), Application layer, and database layer.

Fig. 1: Block diagram of proposed system



Presentation Layer is where data is presented for clients. Application layer is responsible for distributing requests across different applications servers and for business logic execution. Furthermore, Application layer acts as an interface that facilitate communication between Database layer and User interface (presentation layer). Database layer is responsible of data storage, edit, add, and delete. Three-tier architecture presents new technologies such as database server and its ability to modify data within server. In addition, Application server distribution among varies applications in also a new advantage added to the architecture design. Three-tier architecture is more scalable, reliable, and flexible. It provides easier implementation to reusable components.



The Client tier is the user interface and communication layer of the application, where the end user interacts with the application. Its main purpose is to display information to and collect information from the user. This top-level tier can run on a web browser, as desktop application, or a graphical user interface (GUI), for example. Web presentation tiers are usually developed using HTML, CSS and JavaScript. Desktop applications can be written in a variety of languages depending on the platform.

The Business Logic tier, also known as the logic tier or application tier, is the heart of the application. In this tier, information collected in the presentation tier is processed - sometimes against other information in the data tier - using business logic, a specific set of business rules. The application tier can also add, delete or modify data in the data tier. The Business logic tier is typically developed using Python, Java, Perl, PHP or Ruby, and communicates with the data tier using API calls.

The database tier, sometimes called data tier, data access tier or back-end, is where the information processed by the application is stored and managed. This can be a relational database management system such as PostgreSQL, MySQL, MariaDB, Oracle, DB2, Informix or Microsoft SQL Server, or in a NoSQL Database server such as Cassandra, CouchDB or MongoDB.

In a three-tier application, all communication goes through the application tier. The presentation tier and the data tier cannot communicate directly with one another

#### **4. RESULTS AND DISCUSSION**

The implementation of a cloud-based integrated ERP system has proven to be a game-changer for our organization. In this section, we will discuss the benefits we have derived from the system's implementation and how it has transformed our business operations.

##### **Automation of Tasks:**

One of the significant benefits of the ERP system's implementation has been the automation of several manual processes. This has resulted in significant time savings and reduced the burden on our employees. For example, our procurement process is now entirely automated, from creating purchase orders to receiving goods and processing invoices. This has resulted in fewer errors, faster processing times, and reduced costs.

##### **Cost Reduction:**

The ERP system has also enabled us to reduce our costs significantly. By automating several manual processes, we have been able to reduce our reliance on paper-based systems, which has resulted in cost savings in terms of stationery, storage, and processing. Additionally, the system's implementation has allowed us to identify areas where we can reduce costs, such as in our supply chain management. We can now track inventory levels and reorder stock automatically, reducing the risk of overstocking or stockouts.

##### **Timesheet Management:**

The ERP system's implementation has also made timesheet management much more efficient. Previously, we relied on paper timesheets, which were prone to errors and time-consuming to process. With the ERP system's implementation, our employees can now enter their timesheets online, and managers can approve



them in real-time. This has resulted in faster processing times, reduced errors, and increased accuracy in our payroll processing.

**Sales and Invoice Generation:**

Another significant benefit of the ERP system's implementation has been in our sales and invoice generation processes. Previously, we relied on manual processes to create invoices and track sales, which were time-consuming and prone to errors. With the ERP system's implementation, our sales team can now generate invoices automatically, track sales in real-time, and provide customers with timely and accurate information. This has resulted in faster processing times, reduced errors, and increased customer satisfaction.

**Cloud-based System:**

The cloud-based nature of the ERP system has provided us with several benefits. Firstly, it has allowed us to work from anywhere, anytime, which has been particularly important during the COVID-19 pandemic, where remote work has become the norm. Our employees can now access the system from their homes, enabling them to continue working seamlessly without any disruptions. Additionally, the cloud-based system has provided us with a scalable and flexible platform, allowing us to add new users and functionalities as our organization grows.

**Real-time Visibility:**

The ERP system's implementation has provided us with real-time visibility into our business operations. We can now track inventory levels, monitor sales, and analyze financial data, all in real-time. This has enabled us to make more informed decisions about our business, such as identifying areas where we need to cut costs or where we can increase revenue. The system's reporting functionalities have also enabled us to generate customized reports, allowing us to analyze our business operations in more detail.

Finally, the implementation of a cloud-based integrated ERP system has been a significant driver of growth and success for our organization. We have derived significant benefits in terms of increased efficiency, cost reduction, timesheet management, and sales and invoice generation. Additionally, the system's cloud-based nature has provided us with the flexibility to work from anywhere, anytime, and its reporting functionalities have given us real-time visibility into our business operations. We believe that the system will continue to be a critical driver of growth and success for our organization in the future.

**5. CONCLUSION**

In conclusion, this paper has highlighted the strategic importance of implementing a cloud-based Enterprise Resource Planning (ERP) system as a strategic investment for business growth. We have discussed the benefits, challenges, and key success factors involved in such an investment, as well as related work in academic literature and industry reports and case studies.

An ERP implementation is a huge commitment from the organization, causing millions of rupees and can take up to several years to complete. However, when it is integrated successfully, the benefits can be enormous. A well-designed and properly integrated ERP system allows the most updated information to be shared among various business functions, thereby resulting in tremendous cost savings and increased efficiency. When making the implementation decision, management must consider fundamental issues such as the organization's readiness for a dramatic change, the degree of integration, key business





processes to be implemented, e-business applications to be included, and whether or not new hardware need to be acquired. In order to increase the chance of user acceptance, employees must be consulted and be involved in all stages of the implementation process.

Our analysis has shown that a cloud-based ERP system can provide several benefits, including lower implementation costs, scalability, flexibility, improved collaboration and data accessibility, and increased operational efficiency, cost reduction, and customer satisfaction. However, implementing such a system is not without its challenges, such as data security, data migration, integration with existing systems, and effective change management. To ensure a successful transition, organizations should conduct a thorough cost-benefit analysis, develop a detailed implementation plan, involve all stakeholders, and provide adequate training and support. They should also carefully evaluate cloud providers and their service-level agreements to ensure data security and compliance, as well as consider the scalability and flexibility of the system to accommodate future growth and changes in business needs. Overall, the analysis presented in this paper demonstrates that cloud-based ERP system implementation can serve as a strategic investment for business growth and competitiveness. It offers a range of benefits and, if implemented correctly, can position organizations to thrive in an increasingly competitive digital landscape.

## REFERENCES

1. Czinkota, M., & Ronkainen, I. (2012). *International marketing*. Cengage Learning.
2. Klaus, H., Rosemann, M., & Gable, G. G. (2000). What is ERP?. *Information systems frontiers*, 2(2), 141-162.
3. Madurapperuma, T. S., Galkotuwa, Y. K. D., Gunawardana, G. L. C. A., Ramanayaka, R. A. D. K. M., Walpola, D. R. H., & Thelijjagoda, S. (2009). *ERP Deployment in Manufacturing Industry in Sri Lankan Context*.
4. Gibson, N., Holland, C. P., & Light, B. (1999, January). Enterprise resource planning: a business approach to systems development. In *Systems Sciences, 1999. HICSS-32. Proceedings of the 32nd Annual Hawaii International Conference on* (pp. 9-pp). IEEE.
5. Al-Mashari, M., Al-Mudimigh, A., & Zairi, M. (2003). Enterprise resource planning: a taxonomy of critical factors. *European journal of operational research*, 146(2), 352-364.
6. Moller, C. (2005). ERP II: a conceptual framework for next-generation enterprise systems?. *Journal of Enterprise Information Management*, 18(4), 483-497
7. Krafzig, D., Banke, K., & Slama, D. (2005). *Enterprise SOA: service-oriented architecture best practices*. Prentice Hall Professional.
8. Chorafas, D. N. (2001). *Integrating ERP, CRM, supply chain management, and smart materials*. CRC Press.
9. Addo-Tenkorang, R., & Helo, P. T. (2014). ERP SaaS value chain: a proposed SaaS model for manufacturing SCM networked activities. *International Journal of Business Information Systems*, 17(3), 355-372.
10. Jacobson, S., Shepherd, J., D'Aquila, M., & Carter, K. (2007). *The ERP market sizing report, 2006–2011*. AMR Research, 29.