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MODERNIZING LEGACY ERP SYSTEMS: AI AND CLOUD INTEGRATION STRATEGIES

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Abstract:

The advanced technology requires an effective approach to get accurate results. The Legacy ERP systems are critical to many organizations but often operate on outdated technology that limits the factors like efficiency, flexibility, and efficiency. This article looks at how companies can improve their old systems by using artificial intelligence (AI) and cloud computing. It uses existing research and a logical method to study how businesses are updating their systems, the problems they face, and the results they get. Cloud computing helps by giving flexible storage, quick access to data, and lower running costs. AI helps by automating tasks, predicting trends, and making better decisions. Examples from the retail, manufacturing, and finance industries show how companies have successfully updated their systems. However, there are still challenges like high starting costs, difficulties in moving data, employee pushback, and security risks that need to be handled carefully. The article has highlighted the best and effective practices that help in outlining future trends within the structure of ERP systems, and establishes the importance of several strategic planning, continuous improvement and skilled partners to receive long-lasting success with the means of digital transformation.

Keywords: ERP modernization, legacy systems, cloud computing, artificial intelligence, digital transformation, data migration, system integration, enterprise technology, AI in ERP, cloud ERP.

Introduction

In the words of industry 4.0 digital advancement has taken over the conventional process of management. The system called Legacy Enterprise Resource Planning (ERP), is one of the most effective management tools that has become the centre of operations in many companies. These particular systems manage and tackle the tasks such as HR management, accounting and management of inventory. Moreover there are many of them which were manufactured years ago but have become outdated. Considering the features these are way too expensive, often went slow and consisted of a complex upgradation process. In the recent era of the digital technology markets are becoming more profound in AI based implementations, so the purpose of this old system cannot meet up with the modern needs.

In order to be competitive, many companies have transformed their structure to modernize their ERP systems by the application of key technologies like artificial intelligence (AI) as well as cloud computing. The aspects of Cloud computing implementations enable the businesses to work on their internet based ERP systems, ensuring easier access, lowering the cost structure and providing better security. AI implementation on other hand provides smart tools applications that automated the associated tasks, identifies patterns in data, and ensures support in decision-making.

Here in this article exploration of different strategies for modernizing the system of legacy ERP systems by reviewing different existing research and data on companies' experiences. Incorporation of secondary analysis with qualitative data following a deductive approach, this article aims to evaluate how companies are adopting AI and different cloud-based technologies within their system for upgrading. The main motive is to present a transparent overview over the

methods, advantages, and different challenges, and deliver real-world insights for the businesses adopting ERP based modernization.



Figure 1: Modernizing Legacy ERP Systems

(Source: <https://acropolium.com/blog/legacy-erp-system/>)

Method

This article has incorporated a secondary analysis method, including existing literature, and different case studies, expert insights, and industry reports that are related with ERP modernization and its impacts. The study relies on qualitative information which includes interviews, business instances, and a review of published recommendations. These resources offer comprehensive insights into how corporations employ AI and cloud-based services to upgrade their old ERP systems.

The deductive method is adopted, indicating that the study begins with a broad belief that AI along with cloud connectivity could enhance ERP systems in some way. Qualitative data are being evaluated along with different real-world scenarios for having ideas on real world practices. By examining the way firms have addressed advancement, we try to verify the benefits, uncover prevalent issues, and learn what techniques are working best.

This method allows for a greater knowledge of the procedure for modernization through a business and technical viewpoint perspective. It illustrates the real processes firms employ, the tools they utilize, and the benefits they produce. This method of qualitative analysis also creates the scope of identifying different knowledge based information and patterns in order to guide other businesses with the same process.

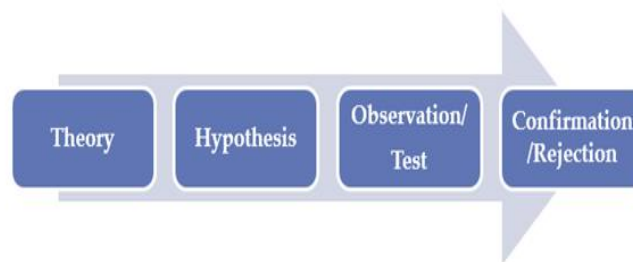


Figure 2: Deductive approach

(Source:<https://research-methodology.net/research-methodology/research-approach/deductive-approach-2/>)

Discussion

1. Why Legacy ERP Systems Need Modernization

There are many legacy ERP systems which were created many decades ago that incorporate outdated hardwares and languages. With the incorporation of advanced technology it is a complex process to integrate these old ERP systems. As these systems accompany several

hindrances like it creates difficulties in scaling, integrating and managing with the process. All these difficulties lead to security risks, limit the way of innovations, and slow down the entire process of business with newer AI-based technologies. For maintaining a balanced position in this modern competitive market, and to meet evolving demands of the customers, businesses required flexible solutions for evaluating different needs real-time data. While in the Modern ERP systems, the process of working provides faster performance, with use of advanced analytics and enhances the user experiences. These advancements enable the businesses to respond to different advancements and changes within the market. With the modernization of their associated ERP systems, organizations meet with benefits of low costs, enhancement in overall efficiency, and getting the opportunity for future growth and developments.



Figure 3: ERP Systems

(Source: <https://www.schgroup.com/services/technology/erp-advisory-implementation/>)



Figure 4: AI and Cloud services

(Source:<https://www.edgeimpulse.com/blog/edge-ai-vs-cloud-computing-making-the-right-choice-for-your-ai-strategy/>)

2. Cloud Integration Strategies

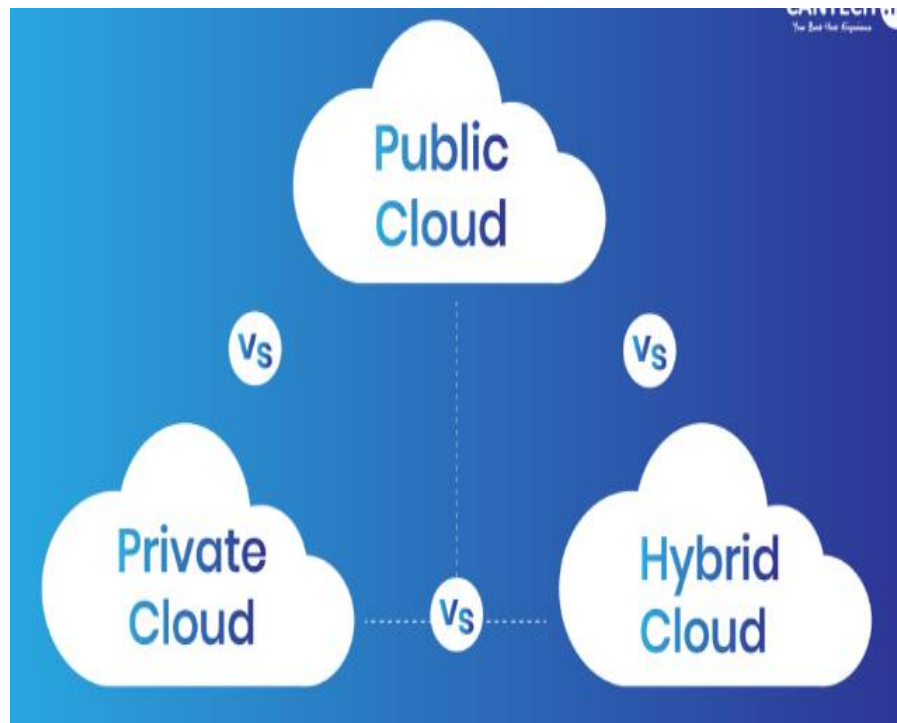


Figure 5: Cloud Integration

(Source:<https://www.cantech.in/blog/public-cloud-vs-private-cloud-vs-hybrid-cloud/>)

Cloud computing has a significant part in the process of ERP modernization. Transforming the ERP systems by incorporating cloud-based facilities enables the businesses to gather, store and assess data over the sphere of the internet, rather than being dependent on different physical servers. Some of the cloud models are:

Public Cloud: Services are provided by companies such as Google Cloud, AWS, and Microsoft Azure. It is a cost-effective system and is scalable enough to be adjusted with time and requirements.

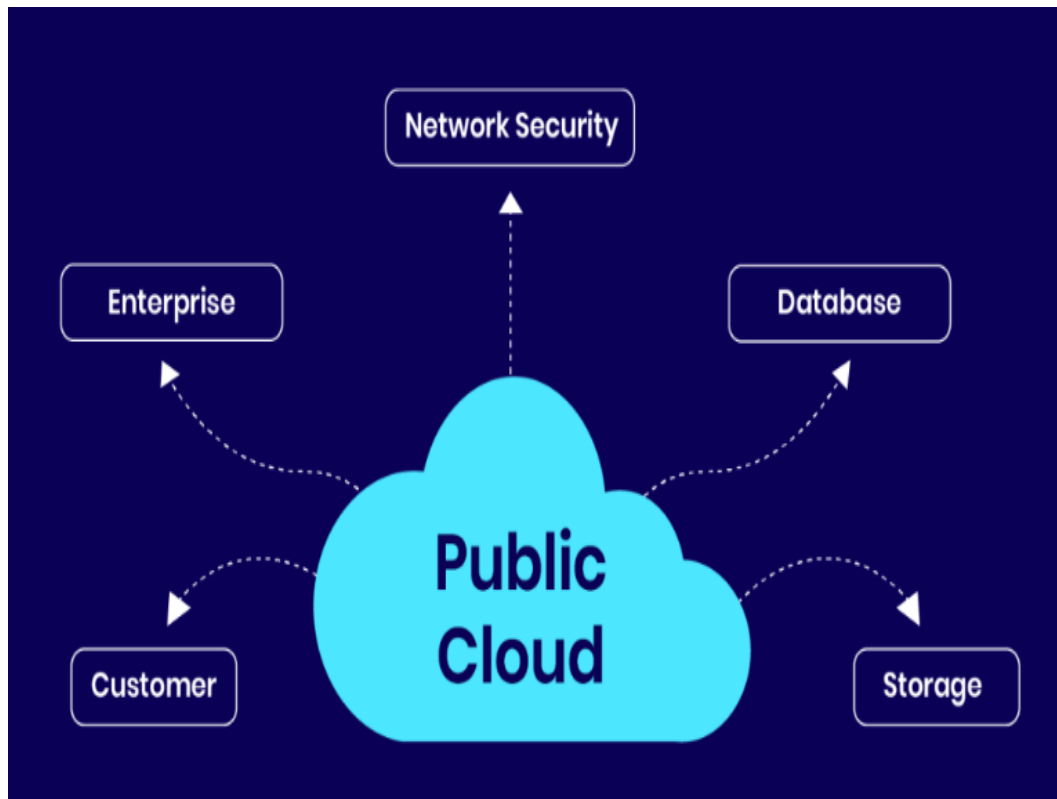


Figure 6: Public Cloud Integration

(Source:<https://www.cantech.in/blog/public-cloud-vs-private-cloud-vs-hybrid-cloud/>)

Private Cloud: Systems are incorporated within private servers specifically used by single operators, giving enhanced security and control over the entire resources.

Hybrid Cloud: This is the mixture of both public and private cloud servers, permits the businesses to manage control as well as flexibility within their entire possession of works.

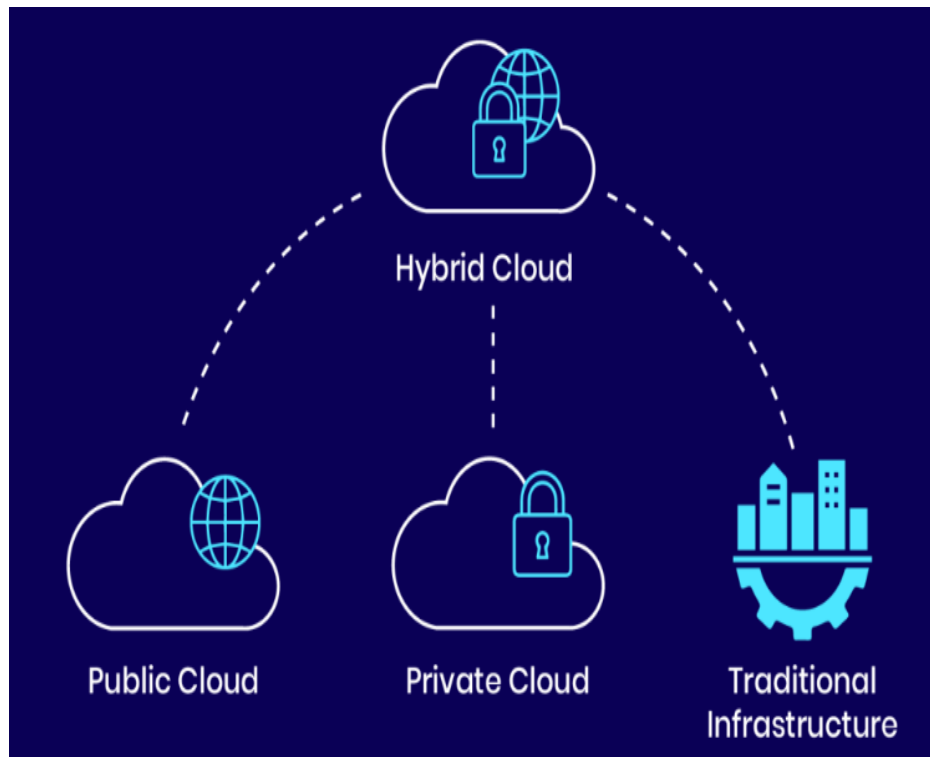


Figure 7: Cloud Integration

(Source:<https://www.cantech.in/blog/public-cloud-vs-private-cloud-vs-hybrid-cloud/>)

Benefits of cloud integration:

- It evaluates the real-time data from different locations and thus provides actual output
- Easier process of software update and the system upgradations
- Cheaper IT expenses and fewer hardware administration
- Enhanced data protection with cloud-provider services
- Versatility to enable company growth

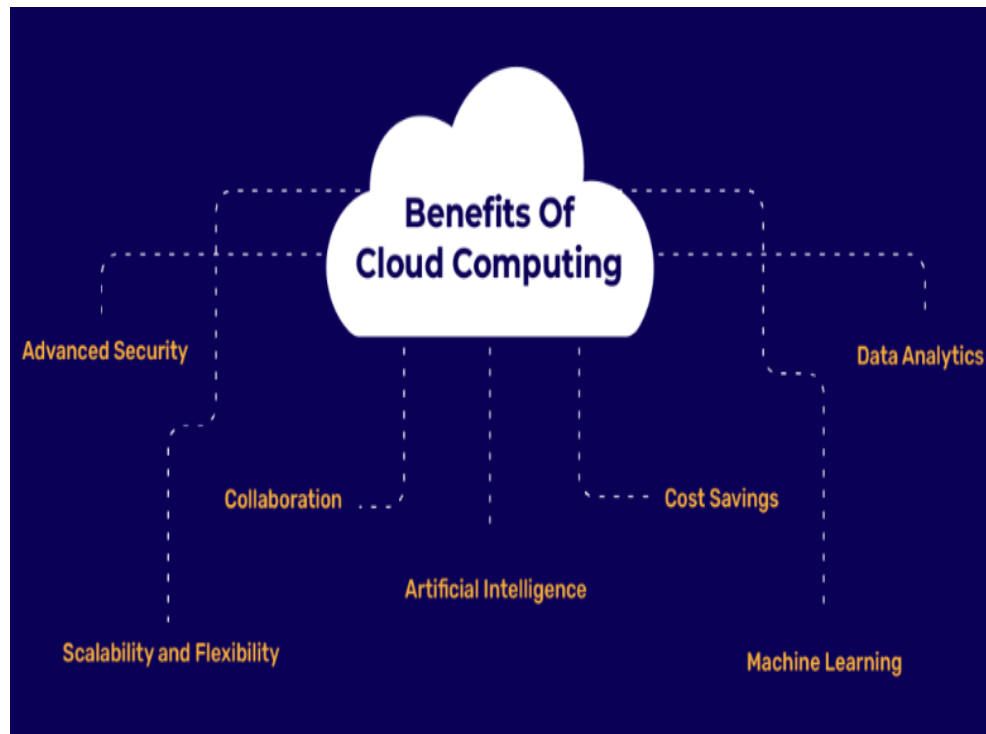


Figure 8: Benefits of Cloud Integration

(Source:<https://www.cantech.in/blog/public-cloud-vs-private-cloud-vs-hybrid-cloud/>)

Companies can choose between two strategies:

- **Rehosting (Lift and Shift):** Transforming the present ERP system towards the cloud-based system along with little modifications.
- **Rebuilding (Re-architecting):** Reforming with new designs, the ERP system pro maximum benefits with its cloud features

Every strategic transformation accompanying its advantages and consequences. The process of rehosting is quite quicker and cost-effective but carries the aspect of less benefits. While rebuilding takes longer time but initiates enhanced performance and provides flexibility.

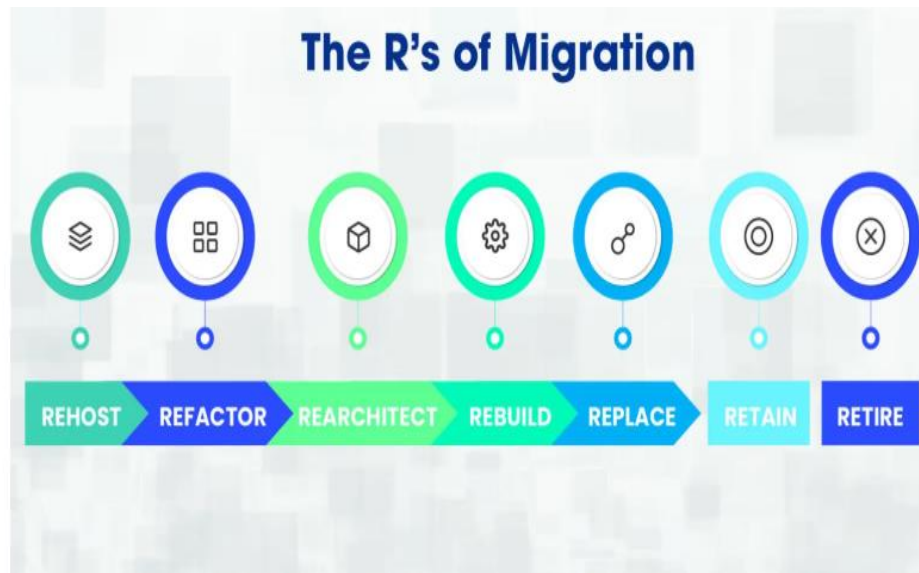


Figure 9: Two R's Strategies

(Source:<https://www.transparency.com/app-innovation/five-modernisation-and-migration-routes-the-rs-of-migration/>)

3. AI Integration in ERP Systems

The implementation of Artificial intelligence (AI) within ERP systems makes the entire structure more efficient and intelligent. It provides help to the companies in automating different tasks, evaluating large datasets, and fosters the advantage of better decision-making.

Key AI features in ERP:

- **Predictive Analytics:** AI can assess sales patterns and estimate potential demand.
- **Chatbots and Virtual Assistants:** These systems provide instant answers to the customers and associated employees 24/7.
- **Process Automation:** artificial intelligence robots may perform regular duties like entering information, handling invoices, and payment.

- **Anomaly Detection:** AI can recognize unusual works or threats of fraud lies within financial data.
- **Smart Inventory Management:** artificial intelligence can suggest the optimal amount of stock according to previous sales and current market conditions.



Figure 10: ERP analytical benefits

(Source:<https://www.selecthub.com/enterprise-resource-planning/erp-analytics/>)

Implementation of AI within the entire working process brings several advantageous ways to reduce human errors, reduces cost of practice, saves operational time, and improves the overall productivity. It enables human labor to concentrate upon higher-value activities.

4. Real-World Examples

Across different industries there are companies who have modernized their existing ERP systems using AI and cloud-based technologies as a successful intervention. Some of the real-word examples are stated below:

Retail Sector: A large retail company used AI to study customer behavior and buying patterns. The system predicted which products were likely to sell more in the future. This enabled the company to minimize excess inventory, enhance inventory management, and boost profitability.

Manufacturing Industry: A manufacturing firm on a large scale transitioned their ERP system to a cloud-based platform, enabling employees to obtain real data of the time regarding the amount of stock present along with manufacturing timetables. This enhancement facilitated quicker access to precise information, resulting in reducing the factors of delays, thus initiating an improved workflow, and accelerated faster decision-making.

Financial Services: One of financial services providers like Oracle had integrated the advanced techniques of AI within its ERP system to manage the overall regulatory tasks. These incorporation of AI technologies facilitated automated checks, compliance concerns and reported unexpected transactions. This ensures saving time, improves overall accuracy, and reduces the chances of fraud.

All stated examples stating that the aspect of ERP modernization is not only the process of upgrading their software rather fostering advancements. It's the process of making operational activities more active and efficient, responsive and data-driven. Whether it brings through better customer insights, smarter automated processes and faster access to information, thus this aspect of modernization fosters actual values of businesses through numerous industries.

5. Challenges in ERP Modernization

1. **Expensive:** The methodical transformation of ERP Modernizing includes a large amount of investments in the starting phase of transformations. This process involves expenses like implementing new applications, services run on cloud-based services, training programs, and effective communications.
2. **Data Migration for efficiency:** Storing data from the existing old systems into the cloud based advanced ERP system consisted of a complex process. Such a complicated process may lead to loss of important data, risks of corruption, and irregular management of data if not regulated tactfully. This process will require effective planning and constant testing in order to ensure secure data and its accuracy.
3. **Employee Resistance:** With the adoption of new technology Employees may not accept this drastic change from the fear of losing a job and unaware aspects of the technology. For instance effective employee training and programs required to ensure employee efficiency and make them aware of new advancements. of the unknown or concerns about job security.
4. **Security Concerns:** Stronger security alerts will be required in storing different sensitive business data within the cloud servers, as this increases the concerns about growing cybersecurity crimes. Companies should inbuilt more effective encryption, and adhere to different data protection laws ensuring enhanced information.

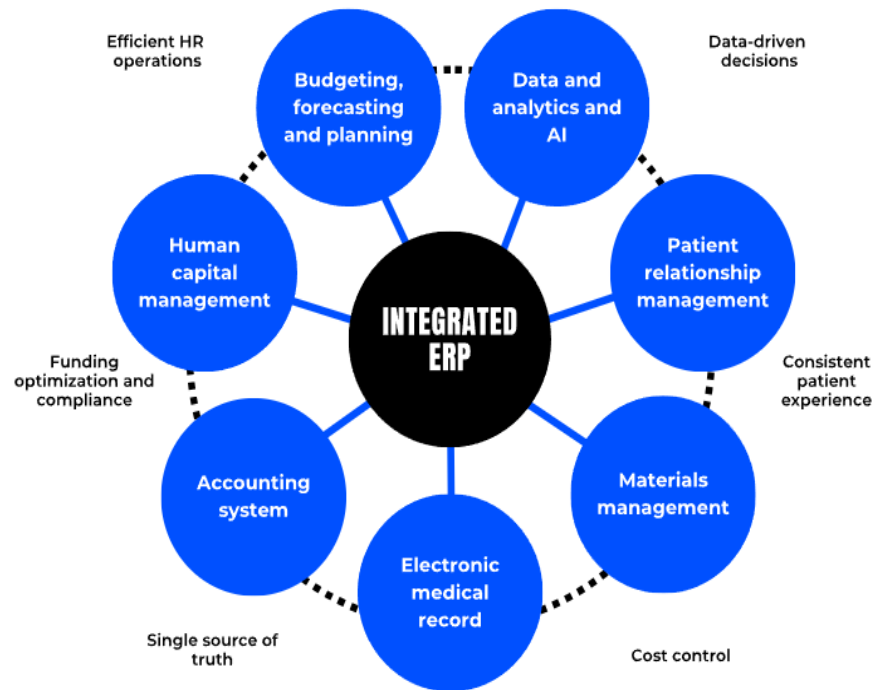


Figure 11: ERP challenges

(Source:<https://www.wipfli.com/insights/articles/hc-tc-7-challenges-that-drive-erp-modernization-in-healthcare>)

6. Best Practices for Success

Based on qualitative research and case studies, the following best practices are recommended:

- **Start with a clear goal:** Know what you want to achieve—cost savings, faster service, better data, etc.
- **Use a step-by-step approach:** Modernize one part of the system at a time.
- **Invest in training:** Help employees learn how to use the new system.
- **Work with experts:** Choose cloud and AI partners with a strong track record.
- **Monitor progress:** Use performance metrics to track improvements and make adjustments.



Figure 12: ERP Best Practices for Success

(Source: <https://www.n-ix.com/erp-modernization-how-to-do-it-right/>)

Conclusion

The transformation or modernization process of legacy ERP systems with implementing different AI and cloud based integration, in today's world cannot be considered as luxury rather these transitions have become a matter of necessity. Conventional systems are insufficient to satisfy the demands for speed, adaptability, and scope of intelligence within the contemporary business environment. Cloud computing technology offers the prospects of enhanced connectivity, flexibility, and affordability, while the factors of artificial intelligence introduce intelligent functionalities that automate entire processes and enhance factors of decision-making. This article, through the means of examination of different practical examples and expert thinking, illustrates how organizations are effectively modernizing their ERP systems by

employing a systematic approach. Meanwhile the issues associated with expenses, resistance to change exist and data transferring required to be managed through effective implementation of employee training programs, effective planning and collaboration with the correct technology partners.

This article includes different qualitative data and a deductive approach in order to evaluate the actual advantages offered by ERP modernization like providing quicker operations, giving smarter aspects of tools, and enhancing the overall business performances. The main aim is to remain centered around corporate goals by maintaining people engaged along the way. Businesses that engage in contemporary ERP systems, as a transition now, are going to be more optimized for future issues and possibilities. The business will gain more scope over advancing the business structure with more effective and flexible operations.

Future Perspectives

Looking forward, ERP systems will continue to evolve in exciting ways:

Smarter AI Capabilities: provides with deep-insights over different aspects, provides support in decision making and automation the complicated tasks.

1. **Hyperautomation:** Additional procedures will eventually be automated from beginning to end, preventing mistakes made by humans while improving efficiency.
2. **Edge Computing Integration:**

Provided with the scope of actual-time operations at different sources like stores and factories, which increases responsiveness and reduces the chances of delays.

3. **Voice-Enabled Interfaces:**

Enterprise resource planning (ERP) systems are going to provide voice instructions allowing free of charge activities, particularly within the processes in warehouses and factories.

4. **Increased Use of IoT:** As the medium of connecting devices use of different IoTs will increase as they snatch data from ERP systems in the process of managing and monitoring data and processes.

5. **Stronger Cybersecurity Tools:** Security systems based on AI-powered tools will enable proper detection and ensure prevention of threats in a faster way.

6. **Greater Focus on User Experience:** Technologies are going to be simpler in form to operate including customized dashboards within its core system as well as accessibility via mobile devices.

7. **Sustainability Integration:** This system will also ensure effective checks over sustainable performances and initiate proper track over the entire working environment considering green business standards.

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