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# Cloud ERP Integration: Benefits, Challenges and Best Practices

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## ABSTRACT

Cloud Enterprise Resource Planning (ERP) applications provide numerous benefits and facilities to the whole enterprise. Cloud computing is a computing model which takes place over the internet and provides scalability, reliability, availability and low cost of computer reassures. Implementing and running ERP systems over the cloud offers great advantages and benefits, despite its many difficulties and challenges faced during integration with external and legacy applications. In this paper, we will explore Cloud ERP Integration best Practices, Benefits and the challenges faced.

**Keywords:** Cloud ERP; Oracle; Technology; Cloud computing

## INTRODUCTION

Within an enterprise, many different systems and processes help manage the many facets of an organization. Of those systems, the Cloud ERP (often referred as SAAS – Software as a service) is one of the most critical. As a result, the need to first understands, and then creates ERP Cloud integration, that is critical to any organization within the enterprise [1].

## WHAT IS CLOUD COMPUTING AND CLOUD ERP?

Cloud computing is a very promising trend of computing which left the attention in the academic researches and as well as in the software industry. Cloud computing is a computing environment which provides availability, scalability, and flexibility of computer reassures at a deferent level of abstraction with low running cost [2]. Cloud computing can be defined as a computing method to provide computing as the utility to meet the everyday needs of the general business community. Cloud Computing refers to the applications, the hardware and software delivered as services over the Internet. The cloud computing services provided in four models, Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Integration Platform as a Service (iPaaS) [3].

Cloud ERP solutions are provided via the Software as a Service model. Different ERP systems offered in the market as a cloud-based ERP system. ERP system considered as a cloud-based when it influenced by the characteristic of cloud computing. The cloud-based ERP system should be accessed via the user browser over the internet without installing or configuring the system at the user side. One of the most famous clouds ERP in the software market is Oracle ERP Financials, Oracle Supply Chain Management and Oracle HRMS cloud services. SaaS generally uses subscription based pricing models for licensing.

## WHAT IS SAAS INTEGRATION?

SaaS integration, or SaaS application integration, involves connecting a SaaS application (such as Oracle cloud ERP) with another cloud-based app or an on-premise software/legacy applications via Application Programming Interfaces (APIs) [4]. Once connected, the app can request and share data freely with the other app or on-premise system in a secured manner. It is useful because it affects relationships between ERP software and other vendor systems so that businesses can customize and select the specific tools they want to have in their solutions. The most extreme form of this is called postmodern ERP strategy. This method is a new way of developing a personalized ERP system for a company that uses solutions from various vendors to essentially build a completely unique ERP program.

Even if we go with a more traditional ERP strategy, implementation can assist in the streamlining of processes by improving the communication between various modules. For example, it is incredibly time-consuming to take data generated

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from our ERP and input it into a different program. Integration can streamline this process and reduce the potential for human error to occur. Human error can have horrible consequences for our business. A 2019 study found that 57% of sampled prescriptions had typos. For our business, a typo might not be life or death, but it can create inefficiency.

The bigger our business gets and the more advanced our software solutions become, the more likely it is that inconsistent data and clunky workarounds will become part of our day-to-day business. ERP software integration is critical in reducing the potential for inefficient workflows through its centralization of information. It also often leads to increased collaboration among various stakeholders and improved transparency.

# CLOUD ERP INTEGRATION BENEFITS

Now that we have a basic understanding of Cloud ERP integration and what exactly it does, we can go into more detail. Let's examine some of the key benefits associated with system integration and how they could positively influence our company's bottom line.

## Single source of truth

Integrating ERP systems with other applications ensures that data from different applications, such as ecommerce and CRM, remain updated in the ERP software. People from all departments would have access to Omni channel business data and it significantly improves internal workflows. For example, our accounting team wouldn't have to reach out to the sales team every month for an updated record of revenue made. Ultimately, having data available in a centralized location helps to facilitate business processes and reduces the amount of time that users spend waiting on people in different departments to provide them with information necessary to complete important tasks [5].

## Automated processes

The more automation, the better. ERP integrations can streamline processes across various departments and workflows. This reduces the amount of manual input required and the time that it takes for tasks to be completed.

## Deliver faster

SaaS Integration tools (such as Oracle Integration Cloud Service) cuts time to deliver getting new connectivity and embedded automation live faster. Reducing the time required to do these kinds of projects gives organizations the ability to capitalize on new opportunities with efficiency and agility. By simplifying technical complexity to deliver change through an integrated hybrid platform, organizations mitigate risk. Following consistent processes and knowing the status of integrations are eased with an integrated hybrid platform (also known as PaaS – Platform as a Service).

## Workflow visualization

Higher visualization of the tasks and workflows of our business goes hand-in-hand with data centralization. Additionally, integration with a tool such as project management software can allow employees to see what their peers are working on. This can be beneficial when requesting feedback from a fellow employee or assigning a priority level to tasks. For example, if we need a standard report from a manager, but see that they are working on a direct request from the CEO, we might downgrade the severity level of our inquiry accordingly.

## Reduction in human error

Because ERP system integration can increase the amount of automation that occurs along business workflows, there is an opportunity to reduce human error. Typos and emails sent to the wrong client can negatively impact our business, so automation is a huge benefit. The amount of human error that occurs every day is incredible, so a reduction in this rate could give our company a competitive edge.

## Infrastructure utilization

With SaaS integration-we can enjoy up to ten times as much utilization that is made available by current virtualization technology through shared operating system multi-tenancy.

Another benefit is that we remove some of the manual burdens of managing a network, because these tasks are done invisibly and automatically by the SaaS database. We can also provide software layer high availability to guest applications on the server. All of this reduces the time it takes to build an application for our organization by 50 to 90 percent.

# CHALLENGES FOR CLOUD ERP INTEGRATION

Companies are adopting the cloud at an unprecedented rate. While the benefits of cloud computing are undeniable and well-publicized, data integration presents a unique set of challenges, particularly in hybrid cloud environments where applications and data reside both on-premises and in the cloud. Below, we will discuss common cloud integration challenges and the best practices for addressing them.

## Culture change remains paramount

Change management is an essential part of deploying any kind of new IT system, and when integrating cloud-based ERP software with on-premises solutions, this is still a challenge that must be overcome. This is an especially pressing concern when considering all of the available platforms, including mobile devices, the Internet of Things and more. An even more important challenge when it comes to change management is ensuring the company culture is receptive to new solutions and can adapt quickly when these systems are implemented [6].

### Compliance

Enterprises, especially those in highly regulated industries, must ensure that they remain data-complaint at all times [7]. When selecting a cloud ERP, data residency requirements and standards need to be met, which can be difficult since data can live in multiple cloud data centers across many different regions and it poses complexities for Integrations.

### Real-time vs. Batch integration

ERPs' business process integration has in the past been batch oriented, which used to work well as transactions were primarily inbound integrations. However, there is now a need to provide outbound data as well from the ERP to other enterprise systems. And in many cases, these systems, like web portals and mobile devices, require real-time information. This can't be handled by traditional ERP integration implementers.

### Continuous integration shift

Thanks to the explosion of SaaS and mobile applications, businesses not only need to integrate their ERPs to internal systems in their data centers, but they also integrate to external systems including cloud-based applications and mobile platforms that use newer and still evolving protocols. Therefore, it becomes a critical strategic move for businesses to choose an integration approach that is up to date with newer protocols and can handle the evolution of these technologies as they move along.

### Lack of control

IT admins will lose a certain amount of control with a cloud ERP over customization and integration because the control usually is in the hands of the ERP software provider. Additionally, as the most alluring factor to choose a cloud ERP is the cost savings, the biggest drawbacks centers on the security of the cloud itself. Our business loses the ability to proactively protect critical information stored in an ERP system that resides on a third-party provider's cloud.

### Learning new systems takes time

There will always be a learning curve with any new tool or solution, and especially with the cloud, there are still new things to learn all the time. Right Scale's latest cloud report found that 95 percent of enterprises were running at least one application in the cloud, according to Forbes contributor Louis Columbus, but that doesn't mean every company is familiar with the specifics of every application [6].

Every company, whether a user or provider, big or small, starts their cloud journey from the same point. The difference in progress between companies is measured by the level of investment and tolerance for failure in gaining knowledge. In order to choose the right strategy, teams must have the proper education and coaching, and it takes time to acquire this kind of knowledge.

The cloud itself is easy to learn; however, it will simply take time for IT teams to learn to navigate the complexities of a hybrid infrastructure in order to get the most out of our systems.

## CLOUD ERP INTEGRATION-BEST PRACTICES

These are some of the most common challenges that can face IT teams when they conduct full integration of cloud-based tools into their current data-gathering systems. In the end, these challenges can be surmounted with ease and then we get all the benefits that deploying a cloud-based ERP system can bring to our organization.

As thoroughly discussed in this chapter, the concept of cloud computing can be effectively used in the field of supply chain management facilitating mainly the collaboration among the supply chain stakeholders through the integration of supply chain activities. More specifically, forecasting on the cloud can reduce the distortion of demand when moving away from the real customer's demand.

### Security

To start with this, first, our organization needs to tell our customer and users about our organization's policies of what they can and can't do with the systems which are integrated into the cloud. This helps an organization in maintaining the security of our data. Also, in case any flaws are noticed, the users can inform the information security team.

Among cloud integration best practices this may seem obvious, but it cannot be overstated that all data in transit must be encrypted. SSL encryption should be used for data being transmitted between locations. If using remote database connections, use the native encryption provided by most database connection drivers. If our data integration solution includes the deployment of local agents acting as proxy to communicate with the database, ensure that communications between agents are encrypted.

### Implementing integration platforms

IPaaS, or integration Platform as a Service, is platforms that standardize how applications are integrated into an organization, making it easier to automate business processes and share data across applications. Companies can quickly integrate applications into business processes, and no longer need to reinvent the wheel with building integration functionality. With the right iPaaS, both line-of-business users and technical users can build, manage, and maintain integrations. Integration platforms (such as oracle Integration Cloud Service comes with inbuilt Integration Adaptors with other applications), that can be leveraged as it is without understanding the complexities of different data structures [1].

### Training and development of employees

For successful cloud data integration, we need to train our employees. We need to tell them about the new systems which

are being installed to govern the data stored in the cloud and applications too. Moreover, our organization should provide training to our employees for the proper functioning of the process.

### Build integration around business processes

When deciding which integrations to enable, start with a strong understanding of the business processes that each application supports. Identify the integration needs of each group of users and align those requirements with the relevant data and processes within our corporate applications while designing the technical Integration.

### API key management

Good management of API keys will make implementing and supporting our integration easier. It will also provide for enhanced data security. Here are some considerations:

- Use one private key per application, or if we have multiple applications, use one key for apps with similar purposes.
- Name keys according to use cases. This will provide a memory aid if an integration service needs to be deactivated or if a security risk occurs.
- If services should not write data, make their API keys read-only.

### Scalability

The integration of our data to the cloud isn't just migrating our application data to the cloud, but we need to put our on-premise data on the cloud as well. For this, our developers need to create the right infrastructure, which also include creating a right framework that will eventually help us out in removing bugs [8].

Moreover, while doing cloud data integration, we need some tools that will help us in improving data quality and data speeds. This can be achieved by appointing the right developer in our organization.

### Expertise in development

For successful cloud data integration, we need to bring a developer who is an expert in this field. He should help us in application development and its integration with the cloud systems. In order to optimize our business operations, we need the right development team, which will streamline our process and will help us in data security as well.

## CONCLUSION

Enterprise resource planning (SaaS) cloud solutions are incredibly beneficial to the productivity and bottom line of companies of various sizes. Like most businesses that operate in the technology sector, SaaS software is constantly changing and adapting to business needs. That is why ERP integration is so prominent in companies today. Its customization opportunities are attractive and often successful. Before we select an ERP system integration strategy or an ERP vendor, it should consider the types of tools that we wish to include in our solution along with the kind of integration that would work best for our company. After all, in today's technology industry, all the choices are up to us.

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