The Impact of Cloud on ERP

A Survey Report on the Migration of ERP to Cloud Environments
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Foreword

The Cloud Security Alliance is a not-for-profit, vendor neutral organization with a mission to promote the use of best practices for providing security assurance within cloud computing and IT technologies, and to provide education on the uses of cloud computing to help secure all other forms of computing. CSA is a member-driven organization led by a broad coalition of industry practitioners, corporations, associations and other key stakeholders.

CSA surveys are designed to assess the trends and maturity of information security technology and services. Onapsis commissioned CSA to develop a survey to add to the industry's knowledge about Enterprise Resource Planning (ERP) implementations. The reports and findings are to be vendor agnostic and allow for global participation. As a sponsor, Onapsis co-developed the initiative by participating in the development of survey questions addressing ERP with CSA. The data analysis and report were prepared by CSA research. CSA prides itself on vendor neutrality, agility, and integrity of results.

The survey questionnaire was distributed to the open community from April 30th to June 11th of 2018 and collected over 200 respondents, the data from which was used to analyze organizational preparedness for ERP cloud solutions in this report.

Thank you to our Corporate Member, Onapsis for funding the development of the survey report. Sponsors of CSA research are CSA Corporate Members who support the findings of the research project but have no added influence on the content development or editing rights of CSA research.

Sincerely,

CSA Research
Introduction

Business digital transformation projects have been an important driver of cloud adoption over the last few years. The cloud computing ecosystem is maturing rapidly with public cloud services spending levels expected to reach $266 billion in 2021. The average enterprise is using over 1400 cloud applications today. This includes business-critical applications, sensitive data, and critical workloads being migrated to cloud environments. With this shift, organizations are starting to explore if a cloud environment might alleviate traditional challenges that business-critical applications, such as Enterprise Resource Planning (ERP) solutions, normally face. Organizations mark this technology shift as a move to digital transformation and modernization of IT systems.

In February, the CSA released “The State of ERP Security in the Cloud” to provide IT and management professionals with a sound overview of cloud security for ERP systems. Exploring the use of ERP solutions in the cloud will help understand the benefits and challenges of migrating sensitive data and critical workloads to cloud environments. The cloud adds new functionality and features to these applications along with its own security challenges.

The “Impact of Cloud on ERP” survey report was designed to assess the impact of ERP solutions on organizations and better understand cloud preparation and data migration needs to implement ERP solutions in the cloud. Features and benefits gained, security and privacy challenges, and time to deploy for an ERP Solution in a cloud environment were explored.

Key findings include:

- 64 percent of organizations are planning or in the middle of an ERP cloud migration project
- 88 percent believe that ERP solutions are very important to their businesses and considered business-critical applications.
- 87 percent of organizations considering ERP solutions plan to use cloud solutions.
- The top three migration security concerns when moving ERP to the Cloud are moving sensitive data followed by security and compliance
- Moving ERP to the cloud helps organizations scale with new technologies (65%) and save on total cost of ownership (61%)
- IAM, firewalls, vulnerability assessments, and IDS/IPS applications are currently the most common security solutions protecting ERP.
- ERP applications are currently being used in hybrid deployment models across cloud and on-premise platforms.
- Only 26% of organizations in this study achieved data migration within their expected time frame.
- Key misconception: While 60 percent of survey respondents claim that they feel the cloud service provider is responsible for a breach, seventy-seven (77) percent believe that it is the responsibility of the organization itself to actually secure their ERP applications
- Regulation slows down data migration to the cloud.

Today, every modern organization in the world greatly depends on technology to run their daily business operations. Organizations believe that ERP represents a model for moving critical applications to the cloud. As businesses transform to the digital era, they are taking added measures to protect their ERP applications and preparing their move to the cloud.
ERP Applications

Over 80% of respondents recall signing non-disclosure agreements, while 20 to 60% of respondents also recall signing other types of agreements related to how they handle company data. This could indicate that signing agreements unless used in tandem with other strategies might not be an effective deterrent for internal confidential data leakage.

Importance of ERP applications to your business

<table>
<thead>
<tr>
<th>Importance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely Important</td>
<td>52.08%</td>
</tr>
<tr>
<td>Very Important</td>
<td>35.42%</td>
</tr>
<tr>
<td>Somewhat Important</td>
<td>10.42%</td>
</tr>
<tr>
<td>Not so Important</td>
<td>1.04%</td>
</tr>
<tr>
<td>Not Important at all</td>
<td>1.04%</td>
</tr>
</tbody>
</table>

ERP is a business-critical application

86.96% Yes  5.98% No  7.07% Unsure
Most Common ERP Applications Being Used

ERP systems today often have three deployment models to choose from: on-premise, hosted, and cloud-based. SAP, Oracle, and Microsoft Dynamics are the most commonly being used ERP applications.

According to the study:

- Most large enterprises (50,000+ employees) use SAP applications (70%)
- More SMB's (1-5000 employees) use Microsoft Dynamic (50%)
ERP Deployment Plans

ERP applications are still primarily used on-premise, however, the growth of cloud solutions is clear. A large majority of the organizations considering or deploying ERP applications within six months is substantially higher for cloud. 24 percent of organizations are considering or getting ready to deploy on-prem applications while IaaS (55%), PaaS (55%),
and SaaS (49%) cloud deployments are much higher. Additionally, 49 percent of ERP cloud application users are not using ERP on-prem solutions. Less than half of organizations (7%) are not considering a cloud model compared to those not considering the on-prem (15%) model.

Many organizations are already using or preparing to use hybrid ERP models with applications across two or all of the deployment models. Organizations deploying ERP on-premise are using cloud deployment models (SaaS 42%, IaaS 27%, PaaS 27%). Organizations primarily focused on ERP SaaS solutions are also using hybrid models (On prem 66%, IaaS 46%, PaaS 46%). The hybrid model is in high use for those organizations using ERP in IaaS as SaaS (67%) applications and on-prem applications (62%) are being used almost two thirds of the time.

There were also interesting ERP adoption trends regionally. Organizations in the APAC (25%) are deploying ERP applications on-prem in the next six months compared to the EMEA (9%) and Americas (6%) regions. Also, organizations in EMEA (50%) are considering IaaS ERP deployments more than in the Americas (30%) and APAC (25%) regions.

|Cloud ERP Security|

The move to cloud has at least three advantages when running ERP applications: faster time to value, increased innovation, and scalability with growth. If the previous statistics show that cloud solutions for ERP are becoming more popular than the on-prem solutions, it is important to understand the underlying security challenges that come with moving to the cloud.

The most common security solutions used for cloud ERP are Identity and Access Management (IAM) (68%), Firewalls (63%), Vulnerability Assessments (62%), and IDS/IPS Applications (59%). Most (84%) SaaS ERP providers also offer event, logs, and user activity for review. Regionally, CASB solutions are much more common in the Americas (42%) region and less popular in the APAC (19%) and EMEA (11%) regions. CASB solutions are expected to govern 60% of large enterprises worldwide by 2022.

2 https://www.gartner.com/doc/3892270
Security Products Protecting Cloud ERP

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASB</td>
<td>29.36%</td>
</tr>
<tr>
<td>Firewall</td>
<td>63.30%</td>
</tr>
<tr>
<td>Identity and Access...</td>
<td>67.89%</td>
</tr>
<tr>
<td>Vulnerability Assessment</td>
<td>62.39%</td>
</tr>
<tr>
<td>IDS/IPS Applications</td>
<td>58.72%</td>
</tr>
<tr>
<td>SIEM</td>
<td>37.61%</td>
</tr>
<tr>
<td>None</td>
<td>0.92%</td>
</tr>
<tr>
<td>Unsure</td>
<td>5.50%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>1.83%</td>
</tr>
</tbody>
</table>

One component of IAM services being used for ERP systems are Single Sign On (SSO) solutions. 79 percent of organizations are using SSO to authenticate ERP solutions. 31 percent of organizations use SSO only for their ERP applications on-prem, 13 percent only use them only for their cloud ERP applications, but 56 percent use SSO to authenticate their ERP applications on both on-prem and cloud environments.
Use Single Sign On for ERP Solutions

Use of Single Sign On across ERP Deployments

The need to secure data and ERP applications in the cloud are going beyond third party add-on solutions and into built-in features for today's cloud ERP offerings. Cloud ERP security benefits\(^3\) include network management, automated patching, enhanced monitoring, access controls, protection from many large scale attacks, and the latest encryption standards. Security features including the ability to review events, logs, and user activity are offered in 84 percent of SaaS ERP providers in this study.

Are you able to receive and/or review events, logs and user activity from your SaaS ERP provider?

- Yes: 83.81%
- No: 10.48%
- Not Applicable: 5.71%
Cloud Migration

Do you currently have cloud migration taking place at your company for your business critical applications?

69.09% Yes 19.39% No 11.52% Unknown

The need to secure data and critical workloads, such as business-critical applications, has become a board-level initiative in organizations world-wide. 69 percent of organizations in this study are migrating data for business-critical applications to the cloud. More organizations in the Americas (73%) and APAC (73%) regions are making this migration compared to the EMEA (47%) region. Regulations in EMEA, such as the European Union General Data Protection Regulation (GDPR) impacted organizational plans for technology purchases, cloud services, and third-party policies.

The data migration to the cloud is a challenge in itself. According to the study, the average migration period was 12 months.

Data migration delays can also prevent adoption of cloud solutions and other technologies. 90% of CIOs have reported data migration projects falling short due to complexity across on-prem and cloud platforms. Only 26% of organizations in this study achieved data migration within their expected time frame. 49 percent had their data migration to cloud delayed while another 24% have yet to complete theirs. Customization (52%), network latency (41%), and cloud provider usage limits (39%) were the most common reasons for delay.

https://www.owasp.org/index.php/Owasp_Cyber_Security_at_the_Board_Level_Project
https://velostrata.com/resources/overcoming-the-challenges-of-cloud-migration/
Data Migration Time

- Much longer than expected: 16.82%
- A little longer than expected: 32.71%
- As expected: 17.76%
- A little less than expected: 5.61%
- Much less than expected: 2.80%
- N/A - Data migration is not complete: 24.30%

Common Reasons for Data Migration Delay

- Network latency: 40.74%
- Cloud provider resource usage limits: 38.89%
- Custom fields, validations, triggers, etc.: 51.85%
- Other (please specify): 18.52%
Top Cloud Providers Selected for Data Migration

- AWS: 27.93%
- Azure: 25.23%
- IBM Cloud: 10.18%
- Google Cloud: 2.70%
- SAP Cloud: 13.51%
- Oracle Cloud: 8.11%
- Unsure: 3.60%
- Other (please specify): 8.11%
Benefits and Barriers to Adoption

The move to cloud has at least three advantages\(^7\) of running ERP applications: faster time to value, increased innovation, and scalability with growth. Scalability with new technologies (65\%), lower cost of ownership (61\%), security patching and updating by the provider (49\%), availability to the workforce (44\%), and adoption to the latest innovations only available in the cloud (43\%) are the key benefits to moving ERP to the cloud.

Key Benefits Moving ERP to the Cloud

![Bar chart showing key benefits](http://www.oracle.com/us/corporate/profit/big-ideas/072114-hcastel-2245635.html)

Moving to the cloud presents its own set of concerns:

Moving of sensitive data:
Moving sensitive data across platforms can be challenging, especially when relying on third party tools and platforms in the cloud. Major Cloud Service Providers (CSPs) have been moving thousands of workloads into the cloud for the enterprise over the past decade with cloud native migration tools such as encryption of data at-rest and in-transit, network management, and access control features. By 2020, 83\% percent of enterprise workloads are expected to be in...

\(^7\)http://www.oracle.com/us/corporate/profit/big-ideas/072114-hcastel-2245635.html
the cloud. Re-architecture into a cloud environment versus the lift-and-shift model ensures that organizations can take advantage of the native cloud tools for a successful move.

Security:
Many arguments and models are proving that security in the cloud can be an improvement over security by many organizations versus running on-premise applications. The challenge exists not in the security of the cloud itself, but in the policies, configurations, and technologies managed by the customer. Through 2022, at least 95% of cloud security failures will be the customer's fault. Multiple security solutions are available to meet the needs for securing data, users, and endpoints accessing ERP systems and other business-critical applications.

Compliance challenges:
Regulation and compliance can lead to challenges within industry verticals and across national and international boundaries. The move to cloud allows organizations to better manage data sprawl and categorize workloads into classes of sensitive data. Strong data classification and workload practices can aid in meeting compliance requirements. Public cloud providers have matured to offer compliance as standard, and you can run cloud workloads that meet multiple compliances.

Disruption of business operations:
Data migration times, re-architecting to cloud environments, and third party solutions, among others, can be disruptive to business operations. Business planning, proper architectures, and proper third-party procurement and management of services should be included in ERP strategies and can aid in ensuring a smooth transition into cloud services.

Time to migrate data:
Proper management of organizational data, re-architecting to native cloud tools, and understanding of cloud environments can lead to a data migration strategy that can be planned accordingly. Providers and customers can work together to understand provider capabilities and customer needs. 24 percent of survey respondents in this survey were able to meet these expectations.

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1https://www.owasp.org/index.php/Owasp_Cyber_Security_at_the_Board_Level_Project
2https://www.gartner.com/smarterwithgartner/is-the-cloud-secure/
3http://resource.onlinetech.com/compliant-cloud-services-and-how-to-maintain-them/
### Top Concerns Moving ERP to the Cloud

<table>
<thead>
<tr>
<th>Concern</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving of sensitive data</td>
<td>64.76%</td>
</tr>
<tr>
<td>Time to migrate data</td>
<td>45.71%</td>
</tr>
<tr>
<td>Compliance challenges</td>
<td>54.29%</td>
</tr>
<tr>
<td>Disruption of business operations</td>
<td>46.67%</td>
</tr>
<tr>
<td>Security</td>
<td>59.05%</td>
</tr>
<tr>
<td>None</td>
<td>2.86%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>4.76%</td>
</tr>
</tbody>
</table>

ERP systems have been identified as targets of malware, hacktivist groups, and nation-state actors\(^{11}\) as attempts to disrupt business process and compromise sensitive data in large enterprises.

51 percent of respondents claim to have not had a security incident within the past 24 months. 44 percent didn't know if they had any security incidents and five percent have experienced an average of 3.8 incidents over the past 24 months.

If moving to the cloud, 54 percent believe that cloud ERP will increase the risk of security incidents. 16 percent believe that the risk is decreased or improved in the cloud. 30 percent believe it will remain about the same.

\(^{11}\)https://info.digitalshadows.com/ERPAplicationsUnderFire-Press.html
Security Incidents with ERP in the Past 24 Months

Anticipated Risk of Increased Security Incidents with ERP in the Cloud

Average number of incidence reported was 3.8

5.15% Yes
50.52% No
44.33% Unsure

When it comes to responsibility of a breach and accountability for the consequences, 53 percent of organizations understood a shared responsibility model for security with their cloud providers and third-party vendors and 19 percent of organizations believed in shared accountability for a breach with their partners. 77 percent held themselves responsible for a breach and others put the responsibility on their partners (47% CSPs, 19% third-party vendors). 21 percent held themselves accountability of a breach and others put accountability on their partners (81% CSPs, 32% third-party vendors)
Who is responsible for the security of your ERP applications?

- Your organization: 77.08%
- Cloud provider: 47.92%
- 3rd party vendor: 18.75%

Who would be held accountable if you had a breach of your ERP applications in the cloud?

- Your organization (please specify which department): 41.05%
- Cloud provider: 60%
- 3rd party vendor: 24.21%
Conclusion

ERP solutions and business-critical applications host sensitive data and critical workloads that are central to the stability and efficiencies of how our organizations operate. Cloud ERP solutions are gaining a lot of momentum and considerations in the marketplace with market projections at $30B\textsuperscript{12} by 2021. Cloud ERP deployments are advantageous with many benefits listed from this study, however, the move to the cloud is still very complex for organizations migrating from on-premise systems.

Working with CSPs and third-party solutions for ERP will lead to a greater understanding of the inherited security and new capabilities in cloud ERP offerings. Cloud architectures, data classification, data migration plans, and compliance requirements need to me managed properly with a cloud migration strategy to address the key concerns and ensure a smooth digital transformation of business operations.

This report is intended to help executives and technology practitioners for businesses using or considering the use of cloud ERP solutions, CSPs, and third-party services around ERP to understand some adoption trends for cloud ERP solutions, the benefits sought in the cloud, and the challenges that remain for data migration and security in the cloud. Cloud ERP solutions have matured rapidly in recent years, making them a viable choice for customers when they renew their technology infrastructure or embark on digital transformation.

\textsuperscript{12}https://info.digitalshadows.com/ERPAplicationsUnderFire-Press.html
| Demographics |

Which best describes the of size of your company?

- 23.17% 1 - 1,000
- 26.83% 1,001 - 5,000
- 16.46% 5,001 - 10,000
- 10.37% 10,001 - 30,000
- 4.88% 30,001 - 50,000
- 18.29% 50,000 +

What is your organization's industry?

- 20% Technology
- 14.37% Manufacturing
- 9.38% Government/Aerospace
- 14.37% Financial
- 6.25% Entertainment
- 6.25% Education
- 6.25% Business/Consulting Services
- 7.50% Telecommunications
- 1.88% Utilities
- 0.63% Transportation
- 5% Healthcare
- 7.50% Other
What is your level of responsibility?

- 23.93% C-suite/Executive
- 51.53% Manager
- 24.54% Staff

What region of the world do you reside in?

- 49.08% Americas
- 25.77% EMEA (Europe, Middle East, Africa)
- 25.15% APAC (Asia, Pacific Islands)