Study of Improve privacy and security in Multi-Tenant Cloud ERP System

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Abstract

ERP security cloud challenges used for solving current solutions. Initially, ERP systems, cloud computing and multi-tenancy along with their challenges and security and privacy concerns. Security issues are listed and identified. ERP cloud management designed to create useful security model from data storage, data virtualization, data isolation, and to access the security feature. ERP improve security in multi-tenant SaaS database virtualization, use of encryption of data and search functionality of data and assembly systems , distributed data documentation of tenants and ERP environment in secure application sent to tenant, with development of two-factor authentication It used authentication and enhanced access control for multi- tenant.

Keywords: CC, ERP Virtualization, Saas, Multitenant, CERP

Introduction

Cloud computing is more accessible and service providers to store important data in the cloud. That why cloud-based ERP has grown in recent years, with developers believing the cloud is the best place to host all computing time. According to a study in the ERP systems industry [Tsai et al., 2020], the market share of cloud-based or cloud-hosted ERP systems increased from 23% to 51% between 2015 and 2019. The move from enterprise to cloud-based ERP is accelerating. According to a report published in 2016 [Silva et. Al., 2021], 44%

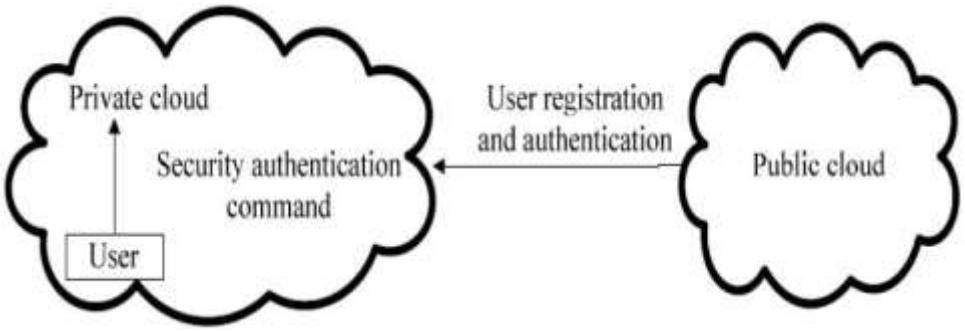
of ERP systems have been used as cloud solutions in the last year. Therefore, each application is unique within the isolated virtual systems. In my work, we aim to investigate and discuss the security issues and discussed some available solutions.

Cloud Computing create new opportunities for businesses by enabling virtualize Internet processes and providing dynamically scalable resources [AlBar and Hoque, 2018]. Cloud Computing means applications offered as a service over the Internet including hardware and software services. Cloud Computing presents an important opportunity called the X-as-a-Service offering. Electric charge model is considered one of the main benefits of using air [Salum and Rozan, 2016]. There is no upfront infrastructure such as a software license investment, there is no risk of not being able to use software licenses and paying for it; equipment and maintenance investment and employees. Cloud service users necessary IT resources by taking advantage of scalability and flexibility of the cloud.

Data Analysis

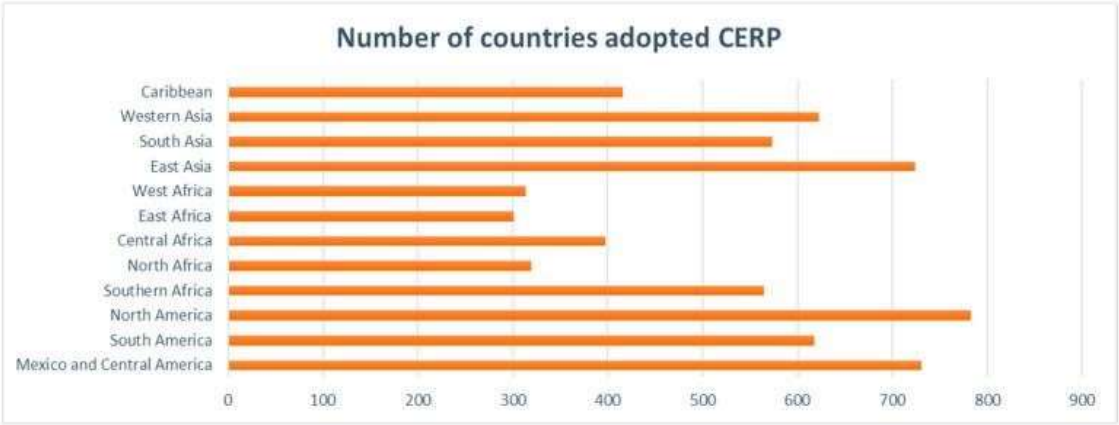
In cloud computing security its difficult platform to handle the new issues of small and medium scale business [6] Multi-tenancy is one of the keys for providing an efficient and customizable platform in business applications. They identified two foundations of many people's background knowledge, dynamic installation and persistence layer abstraction. In [Hasheela and Mufeti, 2016] the authors show that air use can be efficient and effective; however, has increased security vulnerabilities and risks with these advantages, especially in terms of privacy and data loss. By security service level agreements (SLAs) they provide standard security measures assess threats and negotiate, including security scenarios such as integrity and confidentiality, as well as security issues. In [Ming et. al., 2018], the authors proposed a method by which cloud service providers control to their users using two different methods, compression and encryption.

Cloud help us tried expansion the data security:
1) Expand cloud computing service models, its standards and requirements;
2) Cloud computing helps to understand the relationship between security risk and standards;
3) ERP cloud computing understand the risks, success factors and benefits, and key drivers;
4) Helps in Identify security controls, threats in legal issues of cloud.
5) Enhance security for data storage and access in cloud ERP.
6) Enhance the security of cloud ERP applications;
7) Publish the seamless cloud environment trust platform model ;
8) Show transfer data storage for cloud computing in Figure-1.



Theoretical Background

In this section, we present the theoretical background on two topics of article, namely the progress that is important for cloud business adoption and the security key issues of cloud ERP systems and providers. We describe cloud ERP (Enterprise Resource Planning) systems, the benefits of cloud services, and specific issues with security, availability and CERP (Cloud) providers in Figure-2.



The research process is based on the analysis of cloud ERP systems, identifying the security challenges and issues. We used best ideas and recommendations for our data analysis to improve architectures to identify security improvement and privacy in Cloud. [Vrchota et al., 2019].

In addition, potential security tools have been identified to demonstrate that our model meets these requirements, taking into account. Finally, we builds a model based on authentication, authorization and access to improve data security and privacy.

ERP Lifecycle

In 1999, Estaves and Pastor proposed an ERP lifecycle that includes a process phase, and there are several phases that the host organization should follow during the ERP lifecycle [Zadeh et. al., 2018]. This section focuses on the process of ERP systems such as:

- Decision Making: Help managers to decide the way of ERP implementation for solving

their main problems, for improving the system and organization. guide the best path for the information needed.

• Delay: At this stage, the manager must select the most suitable product that complies with, with the most specific and minimum requirements.

• Implementation phase: This phase is also known as customizing the ERP package to meet the needs of the organization, including ERP parameterization and customization.

• Use and Maintenance Phase: The ERP package is used to minimize this. Attempt and returns the expected results to.

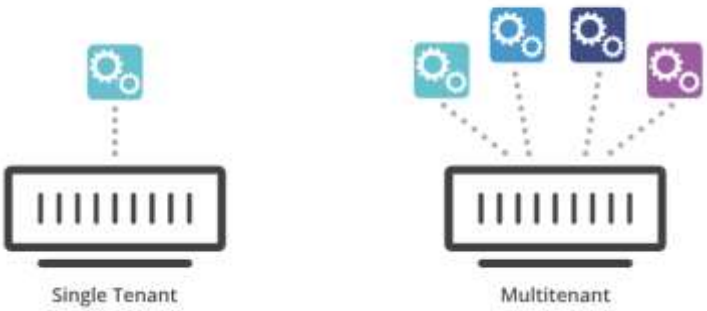
• Evolution phase: Additional ERP benefits can be obtained by integrating additional functionality into existing functionality.

Hybrid cloud computing model help us to reduce the size of data cloud storage and increases the throughput of security. In [Razzaq and Mohammed, 2020], storage services are provided by a cloud (CSP) based on the concept of two cloud providers authentication , encryption/decryption, and a CSP audit service. In [Ibrahim et. al., 2019] the authors present two encryption strategies; one when file is uploaded on the client and the other when the file is sent. Additionally, they provide backup data stored and encrypt data using the Hash Message Authentication Code (HMAC) scheme. However, using two ciphers doubles the time. In [Salih et. al., 2013] the authors design a new cloud storage security trust that analyzes all cloud demand in real-time and encrypts it using to identify sensitive data (Trusted Platform Module). Kerberos is a secure method of authenticating a service request used end users at a trusted gateway [Hadhri et. al., 2017] the authors introduced a SaaS-based cloud computing model called Multitenant Secure and Load Distributed SaaS Architecture (MSLD). This model is divided into five services, one of which is the security service that manages the authentication and authorization process. Multi-tenant means that a single instance of the software and its supporting infrastructure serves multiple customers. Each customer shares the software application and also shares a single database.

Research Methods

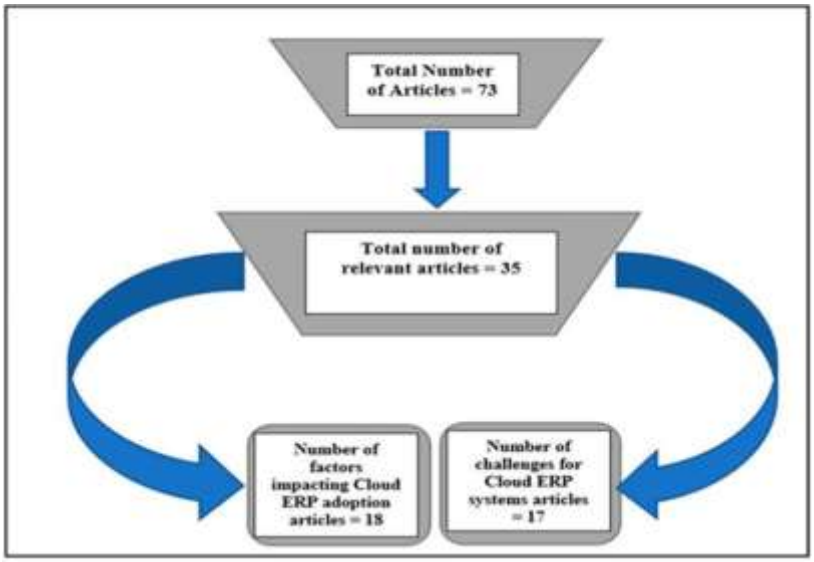
Okoli, 2015 defines the analysis of data in the field of information technology as "a method for finding, analyzing, and combining the existing corpus of complete and working documents that are created and accurate by researchers, academics, and professionals." In addition, a qualitative literature review (SLR) is a tool to identify, evaluate, and interpret all the findings of studies on cloud ERP adoption, as well as specific issues related to security, usability, and vendor CERP adoption.

Research Methods and Data for this study SLR, In [Marinho et. al., 2021] method was used a search strategy is a preliminary set of keywords used to search for information. A research strategy incorporates the principles of the



research problem to reveal the truth.
SLR Methods covers all empirical work related to CSF cloud ERP adoption in organizations. Search strings use advanced search terms to identify related phrases. This content identifies the key elements of the success of cloud ERP systems, along with security, availability, and cloud ERP providers. [Huber et al., 2016]
Data Extraction

Cloud ERP adoption by organizations and the challenges faced by cloud ERP systems. Based on inclusion and exclusion criteria data articles selected by each candidate was analyzed. We also verified the quality of the research report by analyzing Figure-3:



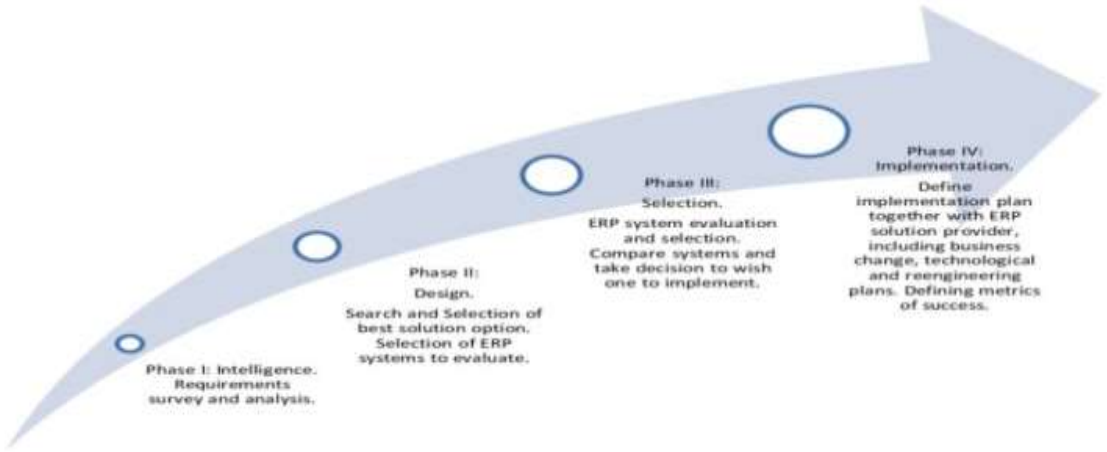
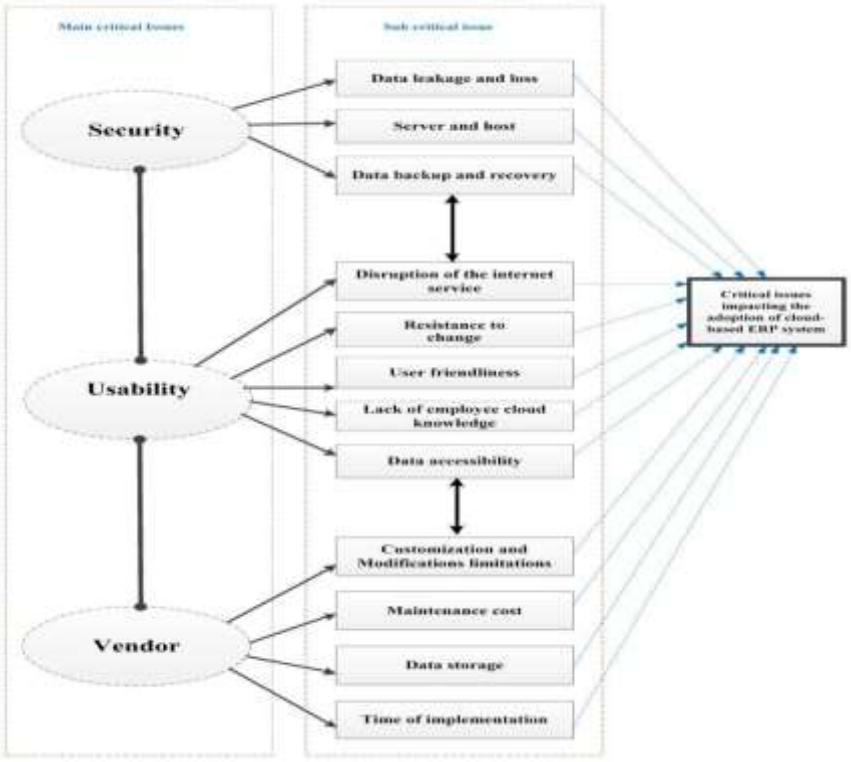


Table-1 above shows all match files generated from the data after using the classification process.

IEEE Explore	Science Direct	Scopus	Google Scholar	Springer Link	ACM Digital Library	Wiley Online Library	Total
9	**7**	**6**	**5**	**5**	**2**	**1**	**35**

The reports on four key factors affecting cloud ERP adoption. First, the importance of the main factors influencing the adoption of CERP is presented according to the frequency with which they are documented as positive adoption of CERP. Second, the classification of drivers' main problems is categorized by safety, usability and sales group. Next, Section presents the actual research model.

CERP providers on policy development and effective strategies to support the use of cloud ERP. The model is designed to facilitate the service provider's understanding the key issues for cloud- based ERP implementation, the interaction of several key issues, and their role in development. CERP vendor's responsibility to ensure that the organization's information is safe, secure and accessible at all times. They must build their own confidence and build trust, confidence and belief in service. In addition, this study helps enterprise leaders, decision makers and policy makers develop effective strategies and policies for using cloud computing to assess the impact and time needed on education and training programs while identifying the need for construction, housing and effective adoption.



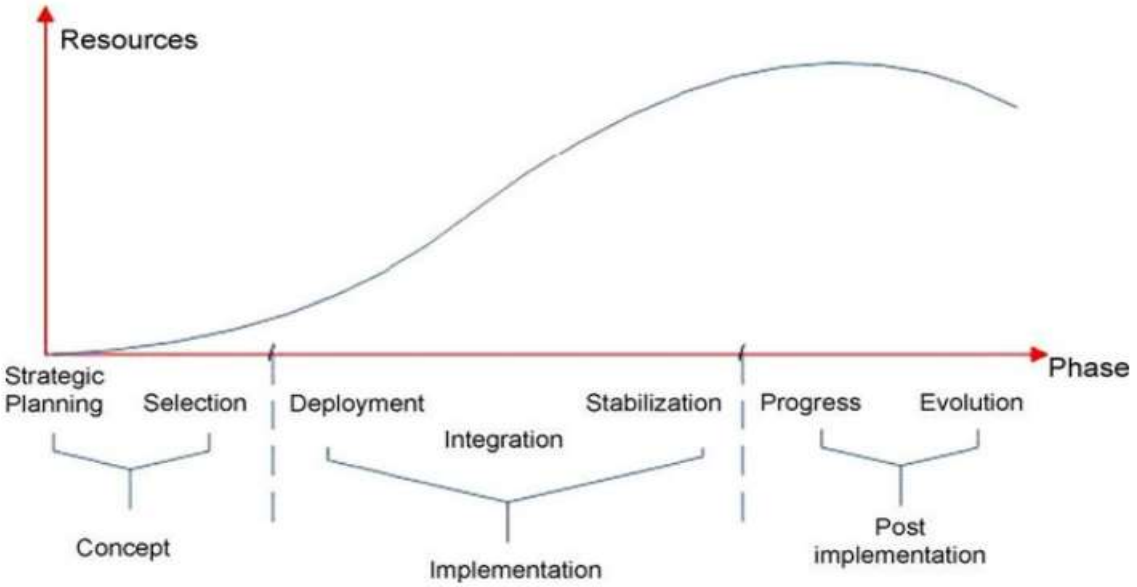
Service and Research Analysis

Cloud ERP adoption to be individual and not satisfied with security importance of success and key enterprise-specific issues such as security, availability, and retail environment prior to cloud ERP adoption.[Natu et. al., 2016] Research has been done on the use of SLR techniques, especially in the areas of security, availability, and commercial use. For example, Research on CSF has focused on the operational level of cloud- based on ERP systems. Therefore, new research was conducted to identify and monitor the barriers to cloud ERP adoption in organizations and the importance of success, especially in security, availability, and vendors and generate new ideas or change existing ideas and policies of effectively integrate cloud ERP into cloud computing process.

Discussion

Based on extensive research, the above model (Figure-4) shows that there are differences in data on cloud-based ERP adoption with suppliers regarding sustainability security, availability, and issues when using cloud-based business. While the relationship between key issues and success factors for CERP adoption has been identified, the current study on CERP adoption has less addressed differences, sustainability, usability, and vendor challenges. This may be due to related issues that are more human and organizational than technology [Opera-Martins et. al., 2016].

Conclusions



To facilitate the adoption of CERP, it is important to identify and identify changes that may impact cloud ERP systems. ERP systems identified in this study and determined by their occurrence in the literature. These are the most important points to ensure the effectiveness of cloud ERP solutions in an enterprise. Additionally, the study identifies security, usability, and vendor factors that affect CERP adoption using an easy-to-understand model. The main limitation of this study is that although differences in CSF were identified during the adoption of ERP cloud-based systems, they could not be fully closed in the implementation process due to lack of publicity. Our research is to conduct a research study to determine various aspects of the integration, environment, function and identity of the CSF and CERP system at different levels.

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