

Why SMEs Should Consider Adopting Cloud ERP: A Literature Review

Yogeswari Suppiah

Faculty of Computer Science and Information
Technology

University Selangor, Malaysia

Marina Binti Hassan

Faculty of Computer Science and Information
Technology

University Selangor, Malaysia

Abstract – Technology is ever changing. On-premise ERP has been adopted by industries almost two and half decades ago. Nowadays, cloud computing has taken over the technology era. Cloud computing plays a vital role in offering an organizations with a pool of third-party hosting of IT resources applications and services virtually through the web. Cloud ERP also known as SaaS(Software-As-Service) ERP. Current studies show that there are many large organizations have been adopting cloud ERP recently. They have observed the benefits and opportunities offered by cloud computing. But SMEs are resistant to adopt to this new technology for various possible reasons mainly high cost of implementation. This paper aims to provide a detailed overview on the opportunities, benefits and advantages of cloud ERP. This paper would be useful for future adopters and decision makers of cloud ERP in SMEs.

Keywords : Cloud Computing, ERP, Cloud ERP, SaaS, SaaS ERP

I. INTRODUCTION

Cloud ERP or SaaS (Software-as-a-Service) is a software model that incorporates the delivery of a software application to a remote client via the Internet. Software-as-a-Service relies on the centralized hosting of a software application in the “cloud” which is typically accessed via a web browser application. Enterprise resource planning (ERP) allows a company to use several integrated applications together to fulfill multiple needs of a business enterprise. ERP is the most talked about technology these days. The Gartner Group first used the term ERP in the 1990’s. The idea was to incorporate all features of the business enterprise under one software application.

Yogeswari Suppiah is with Faculty of Computer Science and Information Technology, University Selangor, Selangor, Malaysia.

Marina Binti Hassan is with Faculty of Computer Science and Information Technology, University Selangor, Selangor, Malaysia.(e-mail: marina@unisel.edu.my).

Since then ERP systems have been successfully implemented in the following sectors: IT enterprises, communications companies, financial companies, government and public sector, hospitals and health care, wholesale companies, pharmaceuticals companies, automotive manufacturing companies, textiles companies and etc. [6].

The Cloud computing enables enterprises to unleash their potential for innovation through greater intelligence, creativity, flexibility and efficiency, all at reduced cost. Some cloud software are widely accepted and implemented by organizations. They include customer relationship management (CRM), such as Salesforce.com, Microsoft CRM, and Human Resources, such as ADP, Ultimate Software Group, PDS. Cloud ERP offers businesses speed of implementation and lower costs of entry. It is the shortest possible route to a new ERP system. One of the main advantages of cloud ERP is the low cost of entry. No need to purchase expensive equipment or make sure that you have sufficient infrastructure to handle the system. Simply downloading a software application onto computers and allow a hosting company to provide the service [13]. Even though SMEs want to consider adopting cloud ERP to efficiently manage their business, high software and license fees, and implementation complexity has created some resistance for them. With all these limitations, they still need to find a solution to deploy ERP to keep them sustained in the global market and to provide them with a competitive advantage [14].

Software-as-a-Service involves a third party provider, supplying capacity, software, applications and services via the internet on a pay-as-you-use basis. Therefore rather than install and maintain software, SMEs can simply access whatever service they need directly from the internet. This frees them from the responsibility of complex software and hardware management. Software-as-a-Service offers a variety of options from basic applications, such as word processing sheets; to more complex applications, such as customer relationship management and

enterprise resource planning applications [10]. This paper explores the need for a SMEs to consider adopting cloud ERP. The paper is structured as follows; the next section discuss the research method. This follows by search process and listing. Subsequently, the findings derived from the study are presented and discussed. Finally, discussion and recommendations for future work are proposed.

II. METHOD

This study has been undertaken as a systematic literature review based on the original guidelines as proposed by Kitchenham,[9]. The steps in the systematic literature review method are documented below.

2.1 Research Questions

The research question addressed by this study is :
What are the opportunities, benefits and advantages for SMEs adopting cloud ERP ?

2.2 Search Process

The search process was a manual search of specific conference proceedings and journal papers from year 2010 till year 2015. The keywords such as “ cloud ERP”, “ SaaS ERP”, “benefits of cloud ERP”, “advantages of cloud ERP” and “opportunities of cloud ERP” were used for selecting the papers. The selected journals and conferences are shown in Table 1.

Table 1

Selected journals and conference proceedings.

No.	Source
1	Proceeding of the World Congress on Engineering and Computer Science 2011 Vol II WCECS 2011
2	Innovative Computing Technology (INTECH), 2014 Fourth International Conference
3	Proceedings of 2012 International Conference on Cloud Computing Technologies, Applications and Management, ICCCTAM 2012
4	Procedia Technology
5	Journal of Systems and Information Technology, 2014
6	International Information Management

	Association, Inc. 2011
7	Advances in Asian Social Science (AASS), 2013, World Science Publisher, US
8	Knowledge Horizons – Economics @ Pro Universitaria
9	Hawaii International Conference on System Sciences, 48 th , 2015
10	Journal of Basic and Applied Scientific Research 2012
11	IEEE 10th International Conference on e-Business Engineering, 2013
12	The Journal of Computer Information Systems; Summer
13	2014 International Conference on Information Systems and Computer Networks (ISCON), IEEE
14	Supply Chain Management, An International Journal
15	Journal of Information Systems & Operations Management
16	Asian Journal Of Management Research
17	International Journal of Innovation, Management and Technology Vol.5, No.4 August 2014

2.3 Inclusion and exclusion criteria

Articles on the above topics, published between year 2011 and 2015 were included.

The articles about cloud ERP which does not emphasized on the benefits and advantages were excluded from the study.

2.4 Data collection

The data extracted from each study were :

- Title of Paper
- Journal
- Publication(Year)
- Problem Statement
- Proposed Hypothesis
- Research Methodology
- Research Questions
- Performance Measurement Used

- Data Used
- Specific Tools Used
- Analysis and Findings
- Future works

All the extracted data were summarized in a tabular format for analysis purposes. An extensive study conducted to extract all the benefits, advantages and opportunities of cloud ERP highlighted in the selected articles.

III. RESULTS

This section summarizes the result of the study analyzing the benefits, advantages and opportunities of adopting cloud ERP.

No	Benefits/ Advantages/ Opportunities	Source (Author)
1	Lower upfront costs Lower operating costs Transparency of TCO - enhanced financial image Lower TCO Availability Scalability- Flexibility Fast deployment Integration with other systems and services Access to leading technologies and skills Business focus always on the latest software release Accessibility – ease of use	[8]
2	No capital expenditure Direct & Indirect investments No investments Ballooning costs Low- cost subscription model Long implementation time Implementable in weeks Rigid Scalable Limited access Anytime, anywhere access Upgrade at extra cost Free upgrade Limited licensing Flexible licensing	[2]
3	Reduced cost Increased storage Highly automated Flexibility More mobility Allows IT to shift focus	[5]
4	Pay-as-you go billing model (the	[12]

	company is typically billed by the minute, hour or data transferred, also called “utility computing”) Automatic scalability(though this might incur additional costs) Only pay for the components you use (as opposed to buying a bundle and not using it exhaustively) Complete outsourcing of anything process related, letting the company focus on their core competencies The opportunity to enter new markets by adopting a SaaS solution	
5	Use multiple Cloud providers; use elasticity to prevent DDOS Standardize APIs; compatible SW to enable surge computing Deploy encryption, VLANs, firewalls; geographical data storage FedExing disks; data backup/archival; higher BW switches Improved VM support; flash memory; gang schedule VMs Invent scalable store Invent debugger that relies on distributed VMs Invent auto-scaler that relies on ML; snapshots for conservation Offer reputation-guarding services like those for email Pay-for-use licenses; bulk use sales	[4]
6	Less internal hardware investment Lower start-up cost Less internal burden for system maintenance Better IT support from external experts Enable better performance of multi-tasks Faster systems response time System speed will not be slowed down by increasing data storage Enhanced user satisfaction Enhanced user efficiency Centralised upgrade supported by cloud vendors No individual upgrade installation	[11]

	Automatic and incremental upgrade provided by a cloud vendor Easier to remain customized features after upgrade Get system accessed anywhere through web browser Get system accessed through mobile devices	
7	Reduce cost Data are available online Collaboration and sharing facilities Access to information in a secure environment Performance achieved High degree of flexibility High storage capacity Secure data transfer High Scalability Increased productivity	[7]
8	Flexible Payment-Pay per use Low Entry Cost. Low Operational Cost Low IT manpower requirement Low Implementation time Reaching the extended user community Elasticity Customization User friendliness	[14]
9	Lower cost Immediate Access Lower IT barriers to Innovation Scale their services New classes of applications <ul style="list-style-type: none"> - Mobile interactive applications - Parallel batch processing - Business analytics - Extension of compute-intensive desktop applications 	[3]
10	Low cost <ul style="list-style-type: none"> - Implementation - Support - Licensing High Data Availability High privacy	[1]

11	Enhance growth Financial benefits <ul style="list-style-type: none"> - Return on Investments Non –Financial benefits <ul style="list-style-type: none"> - Organizational effectiveness and efficiency - Reduction in customer complaint - Improved decision making Responsive to market dynamics Improve business processes Attain Competitive advantage Exchange data and information Improve customer service Lowered Inventory levels Enhanced global operations	[10]
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IV. CONCLUSION

Cloud ERP is a great opportunity for SMEs. There are many benefits, opportunities and advantages of cloud ERP that need to be observed and considered by SMEs. Cloud ERP or SaaS ERP based applications provide a means by which SMEs can compete on an equal ground with larger organisations. The major benefits discussed were cost reduction, data availability, pay-per-use, added competitive advantage, lower entry cost, user satisfaction and etc. Almost all the articles selected have discussed about the cost. Cloud ERP has promised lower upfront or startup cost and reasonable maintenance or operational cost.

V. FUTURE WORK

The research has studied the findings of researchers of SaaS ERP or cloud ERP systems in order to understand the benefits and advantages of the systems for SME's. In future, the finding from this study need to be validated by conducting research at selected SMEs that have been adopting to cloud ERP. Only then it would be possible to confirm the result extracted from this study. Future research could also explore and compare the benefits and advantages of cloud ERP in different industries and countries.

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Yogeswari Suppiah was born in Selangor, Malaysia, in 1977. She received first degree, B.Sc. (Hons) in Computer Science from the University Putra Malaysia, year 2000. Currently she is pursuing Master in Information Technology at

University Selangor. Her current research interests include cloud computing, big data analytics and agile software development. In 2000, she joined the Department of Academic, Systematic Education Group of Colleges (SEGI), as a Lecturer. She became course coordinator and promoted as Head of Department. She was appointed as senior lecturer at KLMU (Kuala Lumpur Metropolitan University) in year 2008. Then, in year 2012, she was attached with Asia Pacific University (APU).



Marina Hassan was born in Johor, Malaysia in 1979. She received first degree from University Putra Malaysia in 2002 and Master in Computer Science (Software Engineering) from University Selangor in 2010. She is currently pursuing

her Ph. D. degree in Information System from University Putra Malaysia. In 2007 she joined University Selangor (Unisel). Her research interests include software engineering, software requirement and enterprise resource planning software.