

TO ASSESS IMPACT OF ORGANIZATIONAL FACTORS ON CLOUD
COMPUTING ADOPTION IN SMEs

AZAM ABDOLLAHZADEHGAN

A dissertation submitted in partial fulfillment of the
requirements for the award of the degree of
Master of Science (Information Technology - Management)

Faculty of Computing
Universiti Teknologi Malaysia

JULY 2013

This dissertation is dedicated to my mother and my best friend, Emad kasra for their
endless support and encouragement

ACKNOWLEDGEMENT

First and foremost, I would like to express heartfelt gratitude to my supervisor **Dr. Ab Razak Bin Che Hussin** for his constant support during my study at UTM. He inspired me greatly to work in this project. His willingness to motivate me contributed tremendously to our project. I have learned a lot from him and I am fortunate to have him as my mentor and supervisor

Besides, I would like to thank the authority of Universiti Teknologi Malaysia (UTM) for providing me with a good environment and facilities such as Computer laboratory to complete this project with software which I need during process.

ABSTRACT

Cloud computing has emerged as one of the most challenging topics, discussed among enterprises of IT professionals. Multiple factors influence on cloud computing adoption, and evaluating the impact of organizational factors on cloud computing adoption in SMEs, was determined as the main purpose of this study, which leads to focusing on the TOE framework as a famous theory on the evaluation of IT adoption. Due to the mentioned purpose, organizational context divided into three main factors based on TOE framework. Three sets of critical success factor's criteria were chosen by review of previous studies for each level of the three organizational factor's levels. The proposed framework in this study is comprised of TOE framework, organizational factors and critical success factors criteria, which will be helpful for small and medium size enterprises which aim to evaluate their organizational condition for adopting the cloud based services. This framework has been examined empirically on 20 SMEs in Iran which apply cloud computing. Results after data analysis indicated that top management support, firm size, and technology readiness have a positive effect of adopting cloud based services in SMEs.

ABSTRAK

Awan pengkomputeran muncul sebagai salah satu topik yang paling dibincangkan di kalangan perusahaan profesional IT. Pelbagai faktor mempengaruhi penggunaan perkomputeran awan. Menilai kesan faktor organisasi mengenai penggunaan perkomputeran awan dalam PKS telah ditentukan sebagai tujuan utama kajian ini dan membawa kepada tumpuan kepada rangka kerja TOE sebagai teori yang terkenal di menilai penggunaan IT. Bagi tujuan ini, konteks organisasi dibahagikan kepada tiga faktor utama dalam asas rangka kerja TOE. Tiga set kriteria faktor kejayaan kritikal yang dipilih oleh kajian lepas bagi setiap tahap tiga faktor organisasi. Rangka kerja yang dicadangkan dalam kajian ini terdiri daripada rangka kerja TOE, faktor-faktor organisasi dan kriteria faktor kejayaan kritikal. Ia boleh membantu untuk perusahaan kecil dan sederhana yang mahu menilai keadaan organisasi mereka untuk menggunakan perkhidmatan berasaskan awan. Rangka kerja ini empirikal diuji ke atas dua puluh PKS di Iran yang menggunakan perkomputeran awan. Melalui analisis data, keputusan menunjukkan bahawa sokongan pengurusan atasan, saiz firma dan kesediaan teknologi mempunyai kesan positif ke atas menggunakan perkhidmatan berasaskan awan dalam PKS.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	DECLARATION	i
	DEDICATION	ii
	ACKNOWLEDGMENT	iii
	ABSTRACT	iv
	ABSTRAK	v
	TABLE OF CONTENTS	vi
	LIST OF TABLES	xi
	LIST OF FIGURES	xiii
1	INTRODUCTIONW	1
	1.1 Introduction	1
	1.2 Problem Background	3
	1.3 Research Question	4
	1.4 Project Objectives	5
	1.5 Project Scope	5
	1.6 The Project Importance	6
2	LITERATURE REVIEW	7
	2.1 Introduction	7
	2.2 Cloud Computing	9
	2.2.1 Cloud Characteristic	10

2.2.1.1	On Demand self-service	10
2.2.1.2	Broad Access via Internet	11
2.2.1.3	Resource Pooling	11
2.2.1.4	Rapid Elasticity	11
2.2.1.5	Measured service	11
2.2.2	Cloud Services	12
2.2.2.1	Software as a Service (SaaS)	12
2.2.2.2	Platform as a Service (PaaS)	12
2.2.2.3	Infrastructure as a Service(IaaS)	13
2.2.3	Payment with mobile commerce application	13
2.2.3.1	Public Cloud	13
2.2.3.2	Private Cloud	14
2.2.3.3	Hybrid Cloud	14
2.2.3.4	Community Cloud	15
2.2.4	Cloud Computing Advantages	15
2.2.5	Cloud Computing Disadvantages	17
2.3	Cloud Computing Adoption in SME	18
2.3.1	SME definition	18
2.3.2	Lack of cloud adoption research in SME	20
2.3.3	Reasons for Adopting Cloud Computing	20
2.3.4	Reasons for Avoiding Cloud Computing	22
2.3.5	Cloud Adoption Models	24
2.3.5.1	Diffusion of Innovation (DOI)	24
2.3.5.2	TOE framework	25
2.3.6	Reason for choosing TOE	26
2.3.6.1	Investigate Studies that Used Only the TOE	27
2.3.6.2	Investigate Studies that Used part of TOE	31

2.4	TOE Framework for IT Adoption in SMEs	33
2.4.1	TOE Discriptoion	33
2.4.2	Research model and Hypothesis	34
2.4.2.1	Technical Context	36
2.4.2.2	Environmental context	36
2.4.2.3	Organizational context	37
2.5	Organizational Context	38
2.5.1	Investigate Organizational context	38
2.5.2	The TOE Organizational Variable	39
2.5.2.1	Top management support	40
2.5.2.2	Firm Size	41
2.5.2.3	Technology Readiness	42
2.6	Critical Success Factor for IT Adoption	43
2.6.1	Critical Success Factor in IT Adoption	43
2.6.2	Critical Success Factor for Outsourcing	45
2.6.3	Critical success Factor for Cloud Adoption	47
2.7	Discussion on literature	50
3	RESEARCH METHODOLOGY	54
3.1	Introduction	54
3.2	Research Design	54
3.2.1	Planning Phase	57
3.2.2	Analysis Phase	58
3.2.3	Design Phases	60
3.2.4	Testing Phase	61
3.3	Data Collection Method	62
3.4	Case Study Background	62
3.5	Population and Sampling	63
3.6	Analysis Method	64

3.7	Research Summary	66
4	MODEL AND HYPOTHESIS DEVELOPMENT	67
4.1	Introduction	67
4.2	Hypothesis Development	67
4.3	Proposed Framework	72
4.3.1	Variable Description	74
4.3.1.1	Top Management Support	74
4.3.1.2	Firm size	75
4.3.1.3	Technology Readiness	76
4.4	The Study Instrument	77
4.5	Questionnaire Validity	81
4.6	Research Participants	82
4.7	Chapter Summary	84
5	DATA ANALYSIS	85
5.1	Introduction	85
5.2	Questionnaire Analysis	86
5.2.1	Demographic Information	86
5.3	Evaluation of the Proposed Model	89
5.3.1	Reliability Test	89
5.3.1.1	Composite reliability and AVE	91
5.4	Opinion Related to Organizational Context	92
5.5	Validity	93
5.2.1	Construct validity	93
5.2.2	Concept Validity	95
5.6	Correlation Analysis	95
5.7	Result Analysis	96
5.8	Discussion	99

5.8.1	Analyze Hypothesis 1	99
5.8.2	Analyze Hypothesis 2	101
5.8.3	Analyze Hypothesis 3	102
5.9	Conclusion	103
6	DISCUSSION AND CONCLUSIONS	105
6.1	Introduction	105
6.2	Achievement	107
6.3	Challenges	108
6.4	Limitation of Study	109
6.5	Research Contribution	109
6.6	Future Work	110
6.7	Summary	110
	REFERENCES	112
	Appendix A: Evaluation Questionnaire	116

LIST OF TABLE

TABLE NO	TITLE	PAGE
2.1	Cloud Computing Advantages	15
2.2	Cloud Computing Disadvantages	17
2.3	Reasons for Adopting Cloud in Enterprise	21
2.4	Reasons which cause Avoiding Cloud Adoption	22
2.5	TOE factors in different research	27
2.6	Different research used some part of TOE	32
2.7	Critical success factor for IT adoption	43
2.8	Critical success factor for IT adoption outsourcing	45
2.9	Critical success factor for cloud adoption	47
2.10	Criteria of organizational factor chosen	51
3.1	List of Steps	59
3.2	Proposed Enterprise Category & Thresholds	64
3.3	The hypothesis of relationship between model variables	67
4.1	Criteria of organizational factor chosen	72
4.2	Summary of research variables	81
4.3	Basic information about the research case study	83
5.1	Proposed Enterprise Category & Thresholds	87
5.2	Cronbach's alpha for research variables	90
5.3	Cronbach's α result	90
5.4	Composite reliability	92
5.5	Average Variance Extracted	92
5.6	Outlines the mean and standard deviations	93
5.7	Factor loading	94
5.8	Guilford rule of thumb for size and strength	96
5.9	Correlation matrix	97

5.10	loading factor related to cloud computing variable	98
5.11	t.value of hypothesis H1,H2and H3	99
5.12	Results related to top management support	100
5.13	t.Value in hypothesis 1	100
5.14	Results related to firm size	101
5.15	t.Value in hypothesis 2	102
5.16	Results related to technology readiness	103
5.17	t.Value in hypothesis 3	103

LIST OF FIGURE

FIGURE NO	TITLE	PAGE
2.1	Literature Review Structure	8
2.2	NIST Cloud Definition Framework	10
2.3	Proposed Enterprise Category & Thresholds	20
2.4	TOE framework	28
2.5	Cloud Adoption Frameworks	38
2.6	Constructs and their resources	38
2.7	Organizational factor criteria categorized	55
3.1	Framework of the study	58
4.1	Conceptual model for the adoption of cloud	70
4.2	Constructs and their resources	70
4.3	Proposed hypothesis	72
4.4	Organizational context criteria	75
4.5	Proposed TOE, organizational context model	78
5.1	Kind of enterprise	87
5.2	SMEs experience in using cloud based services	88
5.3	kinds of cloud users	88
5.4	Cloud services which use by SMEs	89
5.5	The results of data analysis for proposed model	103

CHAPTER I

PROJECT OVERVIEW

1.1 Introduction

Cloud computing is developing globally, which present the facilities such as services and resource sharing, external information storing, full availability, auto-scalability and most importantly pay-as-you-go or the services renting concept. The cloud computing knowledge was introduced in 1969, however the biggest evolution in this field occurred since 2000.

Cloud provider are capable of delivering the computing resources as a service, and cloud services are included as well, such as software, hardware and platform. It recommends a shift from computing as a product that it owns, to computing as a service that is delivers to the consumers, through the internet from large-scale data centers or clouds. This facility will make the cloud users to be able to utilize these resources everywhere, and every time. Otherwise rapid service delivery will encourage companies to make changes in IT agility for reengineering their business process. The company makes a fundamental revolution in application and interacts with consumers. The results of economic and business research in Europe have shown that cloud computing could build €763 billion (\$1.05 trillion), and 2.4 million new careers by 2015 (Son & Lee, 2011).

Enterprises especially SMEs, strongly require to improve their business strategies and technological equipments, hence, they are suggested to try the

reduction of the complexity of their business and operations to reach their enhanced advantages. In the United States, cloud computing is chosen as a first IT strategy, and in 2011, president Obama mentioned his opinion on cloud which is “The adoption of cloud computing will play a pivotal role in helping the government close the productivity gap between the public and private sectors” (Obama, 2011).

Competition in business market has grown swiftly, therefore it caused all companies to be dependent on having updated skills and technology for producing new services related to market requirement (Pauly, 2011). SMEs limited resources, usually leads them to gain less advantages, in compare to other competitors. Small and medium size enterprises are not able to access all new required IT services technology.

These mentioned findings, and implementing new strategized ideas are strongly required for SMEs, to achieve more advantages in the global market. This new strategy should be able to help SMEs for adopting new required technology. Developing in enterprise IT infrastructure supports us to eliminate some of the barriers for participating the global marketing, helps SMEs to have efficient business, and it gives the users this opportunity to compete in global markets (Tiago Oliveira & Maria F Martins, 2010).

Cloud computing has the ability to play a critical role for SMEs. Due to adopting cloud computing, SMEs is being able to improve their marketing strategy. Cloud providers are ready to offer various tasks for their customers such as infrastructure as a service, software platforms, and business applications. All cloud services are accessible on demands, and they offer full support for purchasing, installing, configuring and operating services, as well (Pauly, 2011). Cloud computing provides an opportunity to the users to access technology every time and everywhere by themselves, without intervening by internal IT (Keane, 2011). However, still there are some issues and difficulties to implement cloud computing services for SMEs. The purpose of this study is to provide the solution, regarding the following issue: how organizational factors can have an impact on cloud computing

adoption in SMEs? The main objective of this survey is to assess the positive impact of organizational factors, on adopting cloud computing in SME based on Technology, Organization and Environment (TOE) framework. This chapter includes the introduction of the study.

1.2 Problem Background

The small and medium size enterprise does not possess sufficient financial and human recourse, in comparison to the large size factories, hence they they are not capable of upgrading their IT requirements efficiently, hence, it will not allow them to have a sufficient chance to compete with powerful competitors, in a business environment. Researches in United Kingdom have shown that SMEs companies are willing to apply the internet and services, for increasing their business opportunities. SMEs understand that the update of the technology usage leads to advance in business fields (Jlelaty & Monzer 2012).

A company is not able to make a quick decision on applying the cloud computing, which is a critical determination which requires investigating all the reasons for any changes and calculating the percentage of company advance, in comparison to the traditional procedure. There are challenges in enterprises, in terms of adopting cloud, due to practical and sociopolitical reasons.

In 1990, Tornatzky and Fleischer developed the TOE framework for adopting IT efficiency in organizations. This framework defined in three main aspects, which are technological context, organizational context and environmental context. TOE was designed for covering the organizations request in adopting and implementing technical innovations, and moreover, it was investigated during three decades in different IT fields, and researchers define specific factors for each context, as well.

In 2011, Low *et al.* proposed a TOE framework for cloud computing adoption, and they defined their framework in three main contexts and eight factors. The organizational context includes Relative advantage, Complexity, Compatibility, Top management support, Firm size and Technology readiness, and the environmental context which can be integrated with Competitive pressure and Trading partner pressure. They investigated their framework for high-tech industry in Taiwan, and they showed that all specified factors had a positive impact on cloud adoption in high-tech industries, except complexity. However, unfortunately, this framework has been investigated in high-tech industry only, therefore maybe their framework may not show the same results on SMEs. Low *et al.* did not cover each factor exactly, with sufficient elements. Therefore organization which requires to adopt cloud computing, will not be able to apply this framework as a complete reference, due to this fact that this framework does not cover all the aspects which are necessary for deciding cloud adoption.

1.3 Research Question

This study assesses the impact of TOE organizational factor, on cloud computing adoption in SMEs, and it will cover three constructs which are used to evaluate the organizational factors impacts on adopting cloud, based on service in SMEs. Therefore, to provide some instructions and guidance's for the research problem, two research questions were identified and formulated, which are:

1. What are the organizational factors that influence on the adoption of cloud computing, in SMEs?
2. How these organizational factors might have a positive impact on cloud computing adoption in SMEs?

1.4 Project Objectives

The research objectives are:

1. To identify the factors that have influence on cloud computing adoption in SMEs, based on TOE model.
1. To propose an organizational context for cloud computing adoption in SME, based on the TOE framework.
2. To evaluate suggested organizational context in SME.

1.5 Scope of Study

The research explored SMEs Company in Iran, to assess the impact of TOE organizational context in SMEs. Due to the fact that the importance of small and medium size enterprises for using new technology are increasing and growing fast, this research highlights two main scopes of the study:

1. The prime highlight is to focus on TOE organizational context, for assessing the impact of organizational factors in SMEs.
2. The second highlight is to concentrate on measuring the SMEs experience in Iran, which evaluates the impact of defined organizational factors on cloud computing adoption, based on the TOE model.

1.6 Significant of Study

The adoption of cloud computing is increasing swiftly between enterprises, and the cloud provider companies offer new services promptly with higher quality, however the lack of a complete framework for evaluation of the cloud computing impact is felt clearly. The development of the framework for cloud computing adoption, can be useful for both users and providers.

TOE (technology, organization and environment) is one of the crucial frameworks which is aside since 1990 for IT adoption. Low *et la.* performed this framework for cloud adoption in high- tech industry in 1990, and defined eight factors for these contexts, and their results proved that seven factors of them play a positive role in cloud adoption, unlike complexity which has a negative impact on it. Hence, we aim to evaluate the impact of TOE organizational factors on SMEs.

REFERENCES

- Alatawi, F. M., Dwivedi, Y. K., Williams, M. D., & Rana, N. P. (2012). Conceptual model for Examining Knowledge Management System (KMS) Adoption in public Sector Organizations in Saudi arabia
- Alpar, P., & Reeves, S. (1990). (Predictors of MS/OR application in small businesses. *Interfaces*, 20(2), 2-11 .
- Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, 26(3), 250-275 .
- Badger, L., & Bernstein, D. (2011). US Government Cloud Computing Technology Roadmap
- Bayo, A., & Lera, F. (2007). A firm-level analysis of determinants of ICT adoption in Spain. *Technovation*, 27(6), 352-366 .
- Brohi, S .N., & Bamiah, M. A. (2011). Challenges and Benefits for Adopting the Paradigm of Cloud Computing .
- Buyya, R., Yeo, C. S., Venugopal, S., Broberg, J., & Brandic, I. (2009). Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility. *Future Generation Computer Systems*, 25(6), 599-616 .
- Chen, J., & Singpurwalla, N. D. (1996). The notion of “composite reliability” and its hierarchical Bayes estimation. *Journal of the American Statistical Association*, 91 .1484-1474 ,(436)
- Chong, A. Y.-L., Ooi, K.-B., Lin, B., & Raman, M. (2009). Factors affecting the adoption level of c-commerce: an empirical study. *Journal of Computer Information Systems*, 50(2), 13 .
- Clum, G. A., Broyles, S., Borden, J., & Watkins, P. L .(1990) .Validity and reliability of the panic attack symptoms and cognitions questionnaires. *Journal of Psychopathology and Behavioral Assessment*, 12(3), 233-245 .

- Commission, E. (2008). SME definition: Recommendation 2003/361/EC regarding the SME definition, accessed on 10 June 2008.
- Depietro, R., Wiarda, E., & Fleischer, M. (1990). The context for change: Organization, technology and environment. *The processes of technological innovation*, 151-175 .
- Dikaiakos, M. D., Katsaros, D., Mehra, P., Pallis, G & , Vakali, A. (2009). Cloud computing: Distributed internet computing for it and scientific research. *Internet Computing, IEEE*, 13(5), 10-13 .
- Dillon, W. R., & Goldstein, M. (1984). *Multivariate analysis*: Wiley New York.
- Etro, F. (2009). The economic impact of cloud computing on business creation, employment and output in Europe: May.
- Géczy, P., Izumi, N., & Hasida, K. (2012). Cloudsourcing: managing cloud adoption. *Global Journal of Business Research*, 6(2), 57-70 .
- Gentzoglanis, A. (2012). Evolving Cloud Ecosystems: Risk, Competition and Regulation. *Communications & Strategies*(85) .(
- Goodman, S. N. (1999). Toward evidence-based medical statistics. 1: The P value fallacy. *Annals of internal medicine*, 130(12), 995-1004 .
- Gottschalk, P., & Solli-Sæther, H. (2005) .Critical success factors from IT outsourcing theories: an empirical study. *Industrial Management & Data Systems*, 105(6), 685-702 .
- Hallberg, K. (1999). Small and medium scale enterprises: A framework for intervention. *The World Bank* .
- Hill, S. A & , Laugharne, R. (2006). Decision making and information seeking preferences among psychiatric patients. *Journal of Mental Health*, 15(1), 75-84 .
- Hofmann, P., & Woods, D. (2010). Cloud computing: the limits of public clouds for business applications. *Internet Computing, IEEE*, 14(6), 90-93 .
- Hsu, P.-F., Kraemer, K. L., & Dunkle, D. (2006). Determinants of e-business use in US firms. *International Journal of Electronic Commerce*, 10(4), 9-45 .
- Jlalaty, M., & Monzer , y. (2012). *Factors in Cloud Computing Adoption*
- Keane. (2011). Cloud Computing .
- Khajeh-Hosseini, A., Sommerville, I., Bogaerts, J., & Teregowda, P. (2011). *Decision support tools for cloud migration in the enterprise*. Paper presented at the Cloud Computing (CLOUD), 2011 IEEE International Conference on.

- Khandelwal, V. K., & Ferguson, J. R. (1999). *Critical success factors (CSFs) and the growth of IT in selected geographic regions*. Paper presented at the System Sciences, 1999. HICSS-32. Proceedings of the 32nd Annual Hawaii International Conference on.
- Kuan, K., & Chau, P. (2001). A perception-based model for EDI adoption in small businesses using a technology–organization–environment framework. *Information & management*, 38(8), 507-521 .
- Kuan, K. K., & Chau, P. Y. (2001). A perception-based model for EDI adoption in small businesses using a technology–organization–environment framework. *Information & management*, 38(8), 507-521 .
- Levenburg, N., Magal, S. R., & Kosalge, P. (2006). An Exploratory Investigation of Organizational Factors and e-Business Motivations Among SMFOEs in the US. *Electronic Markets*, 16(1), 70-84 .
- Lin, H.-F., & Lin, S.-M. (2008). Determinants of e-business diffusion: a test of the technology diffusion perspective. *Technovation*, 28(3), 135-145 .
- Lippert, S. K., & Govindarajulu ,C. (2006). Technological, organizational, and environmental antecedents to web services adoption. *Communications of the IIMA*, 6(1), 146-157 .
- Liu, M. (2008). *Determinants of e-commerce development: An empirical study by firms in shaanxi, china*. Paper presented at the Wireless Communications, Networking and Mobile Computing, 2008. WiCOM'08. 4th International Conference on.
- Low, C., Chen, Y., & Wu, M. (2011). Understanding the determinants of cloud computing adoption. *Industrial Management & Data Systems-1006* ,(7)111 , .1023
- Margaret Tan , T. T. L. (2012). Exploring Organizational Adoption of Cloud Computing in Singapore
The 19th ITS Biennial Conference 2012 .
- Martins, M., & Oliveira, T. (2009). *Determinants of e-commerce adoption by small firms in portugal*. Paper presented at the Proceedings of the 3rd european conference on information management and evaluation. Gothenburg, Sweden, September.
- Mathew, S. (2012). Adoption of Cloud Computing To Enterprise–An Impediment .

- Mehrtens, J., Cragg, P. B., & Mills, A. M. (2001). A model of Internet adoption by SMEs. *Information & management*, 39(3), 165-176 .
- Mohammad.Aziz, F. (2012). Sizing up Malaysia's Manufacturing SMEs - definitional implications. *Statistical Modeling and Analytics Vol.3* .
- Obama, B. (2011) .(*Strategy for American Innovation: Driving Towards Sustainable Growth and Quality Jobs*: DIANE Publishing.
- Oliveira, T., & Martins, M. F. (2010). Firms patterns of e-business adoption: evidence for the European Union-27. *The Electronic Journal Information Systems Evaluation*, 13(1), 47-56 .
- Oliveira, T., & Martins, M. F. (2010). Understanding e-business adoption across industries in European countries. *Industrial Management & Data Systems*, 110(9), 1337-1354 .
- Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation*, 14(1), 110-121 .
- Pauly, M. (2011). T-Systems Cloud-Based Solutions for Business Applications. *Cloud Computing: Principles and Paradigms* .John Wiley & Sons, Inc., Hoboken .
- Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega*, 27(4), 467-484 .
- Pudjianto, B., & Hangjung, Z. (2009). *Factors affecting e-government assimilation in developing countries*. Paper presented at the 4th Communication Policy Research, South Conference, Negombo, Sri Lanka.
- Rogers, E. M. (2004). A prospective and retrospective look at the diffusion model. *Journal of Health Communication*, 9(S1), 13-19 .
- RUI, G. (2007)Information systems innovation adoption among organizations-A match-based framework and empirical studies .
- Saini, S., Yousif, J., & Khandage, S. (2011). *Cloud Computing and Enterprise Resource Planning Systems*. Paper presented at the Proceedings of The World Congress on Engineering 2011.
- Salmeron, J. L., & Herrero, I. (2005). An AHP-based methodology to rank critical success factors of executive information systems. *Computer Standards & Interfaces*, 28(1), 1-12 .

- Schubert, P., & Adisa, F. (2011). Cloud Computing for Standard ERP Systems: Reference Framework and Research Agenda .
- Shahamiri, S. R., Kadir, W. M. N. W., & Mohd-Hashim, S. Z. (2009). A comparative study on automated software test oracle methods. Paper presented at the Software Engineering Advances, 2009. ICSEA'09. Fourth International Conference on.
- Singh , H., & Seehan , D. (2009). Current Trends in Cloud Computing A Survey of Cloud Computing Systems .
- Singh, H., & Seehan, D. (2011). Current Trends in Cloud Computing A Survey of Cloud Computing Systems. *International Journal of Electronics, 1* .
- Singh, J., Tucker, D., & House, R. (1986). Organizational legitimacy and the liability of newness. *Administrative science quarterly*, 171-193 .
- Smuts, H., van der Merwe, A., Kotzé, P., & Loock, M .(2010) .*Critical success factors for information systems outsourcing management: a software development lifecycle view*. Paper presented at the Proceedings of the 2010 Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists.
- Son, I., & Lee, D. (2011). Assessing A New IT Service Model, Cloud Computing .
- Sotomayor, B., Montero, R. S., Llorente, I. M., & Foster, I. (2009). Virtual infrastructure management in private and hybrid clouds. *Internet Computing , IEEE, 13(5)*, 14-22 .
- Sotto, L. J., Treacy, B. C., & McLellan, M. L. (2010). Privacy and Data Security Risks in Cloud Computing. *World Communications Regulation Report, 5(2)*, 38 .
- Subashini, S., & Kavitha, V. (2011). A survey on security issues in service delivery models of cloud computing. *Journal of Network and Computer Applications, 34(1)*, 1-11 .
- Sullivan, F. (2011). State of Cloud Computing in the Public Sector – A Strategic analysis of the business case and overview of initiatives across Asia Pacific
- Sultan, N. (2010). Cloud computing for education: A new dawn? *International Journal of Information Management, 30(2)*, 109-116 .
- Technology, G. (January 9, 2012). 10 Cloud Computing Advantages .
- Thong, J. Y. (1999). An integrated model of information systems adoption in small businesses. *Journal of Management Information Systems, 15(4)*, 187-214 .

- To, M. L., & Ngai, E. (2006). Predicting the organisational adoption of B2C e-commerce: an empirical study. *Industrial Management & Data Systems*, 106(8), 1133-1147.
- Welsh, J. A., & White, J. F. (1999). A small business is not a little big business. *Harvard business review*, 59(4), 18-32 .
- Wetzels, R., Matzke, D., Lee, M. D., Rouder, J. N., Iverson, G. J., & Wagenmakers, E.-J. (2011). Statistical evidence in experimental psychology an empirical comparison using 855 t tests. *Perspectives on Psychological Science*, 6(3), 291-298 .
- Zhu, K., Dong, S., Xu, S. X., & Kraemer, K. L. (2006). Innovation diffusion in global contexts: determinants of post-adoption digital transformation of European companies. *European Journal of Information Systems*, 15(6), 601-616 .