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Adoption of SaaS Enterprise Systems – A Comparison of Indian and Australian SMEs

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Abstract— **SaaS enterprise systems (ES) are the best opportunity for Small and medium-sized enterprises to take advantage of their generic benefits without the investment costs associated with on-premise models. Using a multiple-case study approach, this study analyses and compares the challenges in the adoption of SaaS ES in Australia and India. Vendor's reputation, software fit to business and accounting shift of costs are common triggers for adoption in both countries. Over reliance on the advice from external stakeholders, higher concern for security of the data, customizability of the software and relative importance to relationship management are the key differences.**

***Keywords*— SaaS, Enterprise systems, adoption, case studies**

I. INTRODUCTION

Enterprise systems (ES) are the mainstream approach to managing the enterprise-wide information and processes for a decade now and are firmly entrenched in a majority of large and medium-sized enterprises all over the world. Considering the significant costs of installation and maintenance of ES solutions 'on-premise' and the increasing availability of these solutions under the Software as a Service (SaaS) model, many small and medium sized enterprises (SMEs) are considering this a cost effective way of deriving several benefits of ES solutions. With many leading ES software vendors such as SAP, Oracle, Microsoft, RAMCO and scores of other small local players offering a SaaS based solutions, SMEs are increasingly considering an ES solution as a viable option. Even though it is relatively small in proportion to the overall enterprise applications market, SaaS ES market is projected to reach a market volume of $21 billion in 2015 [1]. In China and India, this market is expected to grow significantly.

This study, using two case study organizations in each country, will analyse the factors influencing the adoption of SaaS enterprise systems and compare them between Australia and India. It will first briefly review the literature and explain the case study methodology employed in this study. Analysis and findings are presented before the paper concludes with implications and further research.

II. LITERATURE REVIEW

Enterprise systems are integrated information systems solutions with an integrated architecture and common database that can be used by organizations as a primary engine for integrating data, processes and information technology in real-time, across internal and external value chains [2]. These standardized off-the-shelf packages, if implemented in SMEs, can deliver benefits such as efficient business processes, real-time access, visibility and accuracy of information, and effective information management [3]. Until recently the cost of adoption and use of an ES on-premise was high and required significant resource commitments that many SMEs cannot afford. They involve significant investment in hardware infrastructure and software licensing, and their implementation requires costly, time-consuming and risky extensive business process changes [4]. In order to cater to the needs of SMEs, ERP vendors such as SAP, Oracle, Microsoft and others have been offering scaled down and less expensive on-premise solutions and now SaaS based models. With dramatic changes in the technologies and competition forcing many SMEs to adopt better technologies, they are now adopting ES for benefits such as standardization, integrated best practice processes, information visibility and real-time data. The next section explains the factors influencing the adoption of SaaS ERP systems in SMEs.

IT readiness of the firm, costs, external pressures and security of data in the cloud are some of the factors influencing the adoption decision as per the literature. For example, pressure from large customers and/or trading partners [5], pressure from suppliers [6], regulatory requirements [7], relative advantage of adopting a new technology such as enterprise systems when compared with competitors [8] and capabilities and reputation of the software vendor [9] were identified as factors in the adoption of any IT innovation. Further SMEs also can derive generic benefits of enterprise systems that include standardized and integrated information and processes, best practices embedded in the solution and improved visibility, consistency and real-time of information across the enterprise and automation of transactional processes [3], [10], if they could implement ES solutions.

Given their limited technical and human resource capabilities, exploiting the benefits of adopting IT innovations were considered challenging for SMEs [11]. With the IT infrastructure and maintenance becoming the responsibility of SaaS service provider, this constraint may not limit SMEs opportunities when it comes to SaaS ES solutions. Further, with low total cost of ownership because of the outsourced expertise, nil investment on IT infrastructure and system maintenance, and faster implementation times, SaaS ES solutions are considered more suitable for SMEs than larger enterprises [12, 13].

In a SaaS environment, managing the risk of sensitive customer and financial data located outside the company premises in the cloud is high, given that SMEs are still responsible for the controls and regulatory compliance. Security of the data, reliability of the system, integrity of the provider, lack of alternative arrangements during service disruptions, poor interconnectivity are some of the security related concerns raised in several past studies [12]-

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[15]. In addition, the configurability of the SaaS ES solution offered in a multi-tenant environment and the associated significant costs and complexity are cited as barriers to the adoption in the literature [8]. Though there is no empirical evidence yet, the potential for process improvements and co-creation of value in a SaaS ES environment is also considered significant [16].

Although there is a lot of interest among practitioners on SaaS ERP systems, empirical research on the adoption and use of SaaS enterprise systems is limited [13]. Recent call for papers for SaaS related studies (e.g. cloud computing and service science) in peer-reviewed IS journals, along with specific suggestions from researchers [17] and [18] show that SaaS is slowly gaining traction among researchers. While deployment of IT innovations is expected to enhance firm performance [19], studies in the context of SMEs on the adoption and use of enterprise systems are limited [18], [20]. With improvement in the economy, these SaaS based ES solutions are predicted to be used not only for non-critical and operational level applications but also for strategic core business functions [21].

In spite of being a key economic contributor, many SMEs struggle to survive and grow. Though there are other internal and external factors induced by social, economic and cultural contexts, lack of successful adoption and use of Information Technologies (IT) is observed to be a crucial factor. Lack of vision to IT adoption, inadequate managerial capabilities, resources constraints and asymmetric relationship with IT software vendors are often reported as factors limiting their ability [22]. Even though the adoption of cloud based solutions is gaining momentum all over the world, general uptake of those solutions is limited in Australia. Even though there is recognition of IT innovations such as enterprise systems as enablers of growth and innovation in SMEs, their adoption and effective use is limited in India and Australia.

III. Research Methodology

This section explains the theoretical framework and research methodology employed in this study

A. Research Questions

Understanding the factors influencing the adoption and continued use of SaaS ES solutions and challenges SMEs face in this context, helps organizations achieve improved firm performance, better management of information and processes and higher returns on investments made in information technologies. Therefore the following research questions are investigated in this study.

Why do SMEs adopt SaaS ES solutions?

How do they differ in India and Australia

B. Theoretical Model

There are several theories that explain the factors influencing the adoption and use of information technology innovations. Amongst them, technology acceptance model (TAM) [23], theory of planned behaviour (TPB) [24], diffusion of innovation theory [25] and Technology-Organization-Environment (TOE) framework [26] are the most popular. While the TAM and TPB are at the individual level, DOI and TOE are at the firm level [27]. TOE framework presents constraints as well as opportunities for technological innovation and integrated contingent organizational and environmental factors faced by firms [28].

This TOE framework identifies technological, organizational and environmental aspects of enterprise context and provides a unified perspective. Though specific factors considered within these three contexts may vary across different studies, the TOE framework has consistent empirical support as applied to various IT innovation domains [27]. Therefore, TOE framework is considered appropriate to analyse the adoption and use of SaaS ES solutions in this study.

C. Methodology

As the SaaS ES phenomenon is recent and the research questions are exploratory in nature, a case study approach is considered appropriate for this study. This approach deals with more complex 'why' and 'how' questions better than survey approaches [29], and are less structured in their data collection than surveys. Within a confined domain, a multi-case study approach provides researchers with an effective means of capturing complex phenomenon and helps uncover and compare ambiguities and conflicting results.

Individual perceptions of senior managers are used to understand and substantiate organizational level phenomenon in this study. Such cross-sectional field study approach using multiple case study organizations provide an opportunity to explore new areas [30] such as SaaS ES solutions adoption and use, and facilitate understanding of the multiple interpretations from different perspectives [31]. It employs TOE framework as a basis for data collection and analysis.

Data was gathered from four case study organizations – two from India and two from Australia and software vendors/service providers. These case study organizations use SaaS Enterprise system solutions provided by two international vendors. Even though the definition of SME varies from country to country and in some countries industry to industry and is based on number of employees, investment in plant and machinery and/or annual turnover, the literature on SMEs considers the issues common and used the term SMEs as applied to local context and studied. Same approach is adopted in this study and case study organizations that have SaaS based enterprise system solution in operation for at least 3 years were identified as suitable for this study. From each of the firms, two respondents were interviewed. It included senior executives/CEO and/or senior managers in Finance or operations. Table 1 gives a summary of the characteristics of the organizations and respondents that took part in this research study.

Using semi-structured interviews, data from multiple case study organizations were collected. A semi-structured interview protocol was developed and one pilot interview was first conducted to test the process of questioning and its structure [31]. Each respondent was interviewed for about 60 to 90 minutes duration. These research interviews were recorded with prior permission and transcribed verbatim for further analysis. These transcripts were sent to individual respondents for validation and their corrections were incorporated. In addition, a chain of evidence was established using verbatim transcripts and notes of observations made during the interview. The data thus

collected was coded and analysed with reference to the theoretical framework discussed earlier, and presented in the analysis section.

Interview questions were loosely structured starting with the background of the respondent, organization and the context. Other questions sought respondents' perception of the key factors influencing the adoption of SaaS ES decision in their firms and the challenges they face in its use and management.

TABLE I
SUMMARY OF CASE STUDY ORGANIZATIONS AND RESPONDENTS

Firms	Organizations and respondent(s)
Agrico in Australia	A direct farm supplier of agricultural imports; $30 million turnover 30 employees General manager with 15 years of experience (Respondent 1- R1)
Lineco in Australia	A reseller of bid linens $60 million turnover 50 employees Senior manager – IT & Accounts (Respondent 2 – R2)
Autoco in India	Manufactures automobile components $15 million turnover 120 employees General manager (Respondent 3 – R3)
Enerco in India	Manufactures and installs small power plants $20 million turnover 170 employees General manager (Respondent 4 – R4)
Software vendors	Software vendor/consultant in India (Respondent 5 – R5) Software reseller/consultant in Australia (Respondent 6 – R6)

IV. ANALYSIS AND FINDINGS

A. External factors

The influence of competition, suppliers, customers and/or government regulatory agencies on the adoption decision is very limited in all the case study organizations. For example, Autoco had decided to adopt an ES when they lost support from their parent company for their Unix based system. In case of Agrico also, for example, there was no pressure from their suppliers as well as from customers. As noted by a respondent, "*most of the supply companies with the exception of big multinationals, are geared to that kind of low technology solutions..are a little technologically challenged.. As long as we can efficiently produce statements, invoices or purchase orders on a fax or send it as a PDF document, everyone is happy.*" (R1).

Reputation of the SaaS ES vendor is an important determinant. Given the short life span of many small software firms particularly in India, the reputation in the country and their longstanding nature was an important consideration for Indian firms in their adoption decision. In Australia, however, both the firms studied have employed consultants to assist them in the adoption and implementation. They have expressed their strong preference to work with existing providers suggesting that relationship management is important. Indian firms, on the other hand, preferred a software vendor with long historical record, size and reputation of the firm. Importantly, none of the firms supported using other low-cost providers available suggesting the importance of quality in the selection of SaaS ES vendor and/or service provider.

B. Organizational readiness and preparation

Organization readiness is an important factor that explains whether a firm is ready to adopt a SaaS ES solution or not. This is dependent not only on the firm's IT-readiness in terms of basic infrastructure, but also its willingness to replace the old systems with the new SaaS based integrated ES and the imperative need to opt for SaaS based solution rather than on-premise solution.

Enerco, for example, used Excel and an older version of stand-alone general ledger software across its various locations, while Autoco had a mainframe Unix-based system that was managed by its parent company. In case of Agrico, they had an on-premise pre-configured ES solution that by another software vendor, that was considered '*slow, and inefficient and not real time*' (R1). Lineco, on the other hand, had an on-premise solution and decided to move to the cloud. While the other three firms had no experience of working with an integrated system, Lineco already had an experience of working with a pre-configured on-premise enterprise system solution. These old stand-alone accounting systems were not capable of handling the business requirements as they have data that is not current and accurate (R4), reporting was complex (R5 and R4) and time consuming (R1). The need to improve the quality of information produced by the system for reporting purposes, and the need to improve process efficiencies were factors that have triggered for changeover to SaaS ES solutions in all the firms.

In terms of preparation, Autoco and Enerco have engaged independent consultants and internal team of experts respectively to analyse their processes and information flows. Further, they both have asked the software vendor to set up a temporary client and actually demonstrate some standard transaction cycles using the datasets given by these firms. This has helped the firms to understand and appreciate the functionality of the solution and ease of use. In case of Agrico and Lineco, evaluation of the alternative options was predominantly done by in-house management team with a simple demonstration of the software by the software reseller and/or consultants. Australian firms, before adopting SaaS solution, already had some information systems serving their needs and had a good understanding and knowledge of the potential SaaS based solutions as well as generic enterprise systems capabilities and limitations. This has helped them develop "*realistic expectations in terms of what it can do and what it cannot do*" (R2). As pointed out by one implementation consultant, "*smaller companies are happy to do things manually and taking one step at a time.. and don't expect the system to do everything now*" (R6).

There are differences on the evaluation of the alternative solutions. As noted by Enerco manager, "*third party consultants cannot argue our needs, our problems and our issues effectively with the software design teams and support specialists and get help*" (R4). Further, the Indian software vendor deployed its own employees as consultants for implementation, while the Australian firms mostly dealt with the resellers and engaged third party consultants to

implement the solution. Australian firms, in fact, preferred a third party consultants and/or implementation partners rather than software vendors. They believed they would get "better service and support" from third party consultants rather than big software vendors typically dominating the market in Australia.

C. Trust

This refers to the extent to which a firm perceives risks to the security and privacy of its data within acceptable level consequent to the adoption of SaaS ES solution. In all the four case study firms, security and privacy of data, fear of service disruptions and disaster recovery were not reported as concerns. Contrary to past studies, firms were satisfied with the arrangements made and guarantees offered by the service providers. As rightly noted by one respondent, software vendors has "*vested interest in ensuring the security and confidentiality of the client's information*" (R4) and that "*they would place much stronger security controls than the clients would ever put in place*" (R1 and R3). SaaS requires a reliable and stable Internet connection. Reliability and cost of bandwidth, though did not affect the adoption decision, its use may be affected. For example, Enerco with its operations in several remote locations, have reported issues with the speed. In Australia, Agrico observed some challenges with the speed. As noted by a respondent, "*is a web-based thing you are subject to the speed of the Internet which for some unknown reasons varies significantly... in the afternoon it is a bit slower as the rest of the world comes online*" (R1).

Further the ability of SaaS ES software vendor to ensure compliance with changing regulatory and legal requirements is considered another positive influencing factor by all the firms. In addition to ensuring compliance, the solution gives the clients some options. For example, it gives "*an option of not adding tax when we are working on a material issued by our parent company*" (R3). Thus the SaaS ES solution delivers full compliance, accommodates varying contexts and enables production of necessary reports for auditing, tax and government reporting purposes.

D. Total cost of ownership

When compared with on-premise ES solutions, SaaS based solutions deliver lower total cost of ownership and influence adoption decision. Initially all the four firms believed this an important factor on SaaS adoption decision and recognised the benefits of shifting one time capital expenditure to monthly operational expenses. Similarly, promises of faster implementation time by the software vendors were a factor in the adoption decision by all the firms. Though the firms were aware of the implementation challenges and huge failures of on-premise ES implementations, they were prepared to absorb these costs considering the long term benefits.

For Agrico and Lineco, shifting of costs and lack internal IT resources were important considerations in their decision to adopt SaaS based ES solutions. With implementation efficiently managed mainly because of the managements' experience of working with existing integrated systems, good understanding of processes, data quality, willingness of managements to push through changes and experienced consultants, the total cost of ownership was achieved.

SaaS based offering typically involves 'pay as you go' pricing model and to a lesser degree fixed or subscription based pricing. In spite of that, all the four case study firms employed subscription pricing model and did not like the 'pay per use' model because of its unpredictability. Further, continuing strategic relationship with the software provider and certainty were considered critical by all the firms.

Freedom to switch to other SaaS ES providers was one of the key benefits identified in the literature. Though this option was available, all the firms except Autoco have preferred a long term relationship with the SaaS ES provider. Even though absence of 'lock-in contracts' and 'monthly subscription fees' were highlighted by the service providers as a key benefit, a long term arrangement was sought. For example, Agrico had asked for a three year contract rather than one-year contract offered by the service provider. The service provider, however, "*insisted on yearly contract, probably to allow itself a room to increase the fees every year*," as noted by the manager (R2). Autoco, however, considered SaaS ES solution as an interim measure and welcomed the option to switch to 'on-premise' model later on. Lineco, Agrico and Enerco, however, were concerned about the difficulties and costs associated with switching from one software vendor to another and preferred a long term arrangement. A summary of the findings are presented in table II.

TABLE II
COMPARISON OF AUSTRALIAN AND INDIAN CASE STUDIES

Theme/factors that impact adoption decision	**Indian firms**	**Aus. firms**
External pressures from suppliers, customers and/or regulatory bodies	No	No
External pressure from competitors	No	No
Reputation and brand image of software vendor	Yes	No
Size and longstanding history of software vendor	Yes	No
SaaS ES solution fit to business	No	Yes
Prior knowledge of ES and SaaS models	No	Yes
Total cost of ownership	Yes	No
Accounting shift of costs (from capital cost to operating expense)	Yes	No
Inadequacies of existing Info systems	Yes	Yes
Technology-readiness of firm	Yes	No
Faster implementation time	Yes	No
Security of data	No	Yes
Fear of service disruptions	No	No
Freedom to switch	No	No
Staff training costs	No	No
SaaS ES software fit to business	No	Yes
Degree of customization possible	No	Yes
Ongoing support from software vendor or SaaS service provider	Yes	Yes
Ongoing support from SaaS vendor or service provider	Yes	Yes

V. CONCLUSIONS

SaaS based solutions are considered the best option for SMEs to take advantage of the benefits of enterprise systems, without the associated costs of IT infrastructure, skills, software, upgrades, training and maintenance in both the countries. According to this study, the reputation and

size of the software vendor, faster implementation time, the willingness of the SaaS vendor to work with the customer throughout the implementation stage and the ability to shift capital expenditure to operating expenses are some of the key determinants of the adoption decision for Indian firms. For Australian firms, software fit to the business, degree of customization possible, inadequacy of existing information systems, and assurance about the security of the data are key factors. Australian firms have customized the product to suite their requirements and believe that it was relatively easy and did not involve much consulting costs. Indian firms, on the other hand, invested significant resources for implementation probably because of the lack of experience working with modern information systems and change management related issues.

Even though firms are aware of the competition, external competitive pressures and/or trading partners' requirements, they were not found to be influential factors in their adoption decision. Even though firm size and reputation played an important role for Indian firms, it is the fitness for purpose that played a key role for Australian firms rather than the reputation and image. Unlike in Indian environment, there were not many local options available to Australian firms and the market was typically dominated by big software vendors. This has prompted the firms to accept a third party consultants who have good local experience and their accessibility for initial customization and ongoing support.

Dispelling some myths surrounding security issues, the study found that security and integrity of data stored at the SaaS vendor is considered safer and more reliable than at the firm's own premises. Indian firms believed the superiority of the SaaS vendor on security issues and therefore more focused on functionality, willingness of SaaS vendor to listen to and work with them in improving product offerings and opportunities for process improvements. Australian firms have realistic concerns about the security and privacy of their data, given the recent incidents of security breaches and storage of vital core applications and customer data in the 'cloud'. As they are using SaaS model for managing its core applications and processes that deliver them competitive advantage in the marketplace, they are more concerned about the security of their data.

All the firms have given importance to relationship management – whether it is with the software vendor directly or the third party provider. Though they are not locked into a contract, changing from one to another is not viewed easy and cost effective by all the firms. It appears SMEs do not consider this as an important benefit in their decision and are looking forward to a long standing relationship with their SaaS service providers.

In summary, the study findings suggest that Australian SMEs are different to their Indian counterparts in three key ways. As smaller in size, Australian firms do not have dedicated IT staff (either in-house or from their large parent companies), and therefore are reliant on the advice given by third party consultants and service providers who would naturally present the solution they are reselling in a positive light. With a few well-publicised security breaches involving cloud services in Australia, and majority of the firms that were have a SaaS solution were using them to support and run their non-critical and non-core applications, they are concerned about the security of customer data while adopting SaaS ES solutions.

Though, the evidence is anecdotal, this study makes an important contribution to the literature by explaining and comparing the determinants influencing the adoption of SaaS ERP systems in India and Australia. This study fills an important gap in the research on enterprise systems that so far tended to focus primarily on large firms and on generic cloud computing issues rather than SaaS ES solutions. This study and the findings have limited by generic case study methodology employed and study of just four SMEs. Further empirical studies investigating the factors influencing the adoption decision and its use will offer deeper insights into this SaaS ES phenomenon and help SMEs to exploit the full potential of these IT innovations.

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REFERENCES

[1] Gartner, "Gartner says worldwide IT spending on pace to reach $3.8 trillion in 2014," Downloaded from http://www.gartner/com/newsroom/id/2643919 on 25 Feb 2014, 2014.

[2] S. Shang, S. and P. Seddon, "Assessing and Managing the Benefits of Enterprise Systems: The Business Manager's Perspective", *Information Systems Journal*, vol. 12, no 4, p. 271, 2002.

[3] R. Seethamraju and J. Seethamraju, "Adoption of ERPs in a medium-sized enterprise – A case study," *Proceedings of the 19th Australasian Conference on Information Systems ACIS 2008*, Christchurch, New Zealand. 5-7 December, 2008.

[4] M. Mijac, R. Picek and Z. Stapic, "Cloud ERP system customization challenges," *Proceedings of the Central European Conference on Information and Intelligence Systems*, Varazdin, Croatia, pp. 132-140, September, 2013.

[5] M-J. Pan and W-Y. Jang, "Determinants of the adoption of enterprise resource planning within the technology-organization-environment framework: Taiwan's communications industry," *The Journal of Computer Information Systems*, vol. 48, no.3, p. 94-102, 2008.

[6] M.M. Caldeira and J.M. Ward, "Understanding the successful adoption and use of IS/IT in SMEs: An explanation from Portuguese manufacturing industries," *Information Systems Journal*, vol. 12, no. 2, p. 121-152, 2002.

[7] N. Melville and R. Ramirez, "Information technology innovation diffusion: An information requirements paradigm," *Information Systems Journal*, vol. 18, no. 3, p. 247-273, 2008.

[8] C. Low, Y. Chen and M. Wu, "Understanding the determinants of cloud computing adoption," *Industrial Management and Data Systems*, vol. 111, no.7, p. 1006-1023, 2011.

[9] T. Heart, "Who is out there? Exploring the effects of trust and perceived risk on SaaS adoption intentions," *The DATA BASE for Advances in Information Systems*, vol. 41, no.3, p. 49-68, 2009.

[10] P. Seddon, C. Calvert and S. Yang, "A Multi-project Model of Key Factors Affecting Organizational Benefits from Enterprise Systems," *MIS Quarterly*, vol. 34, no. 2, p. 305–28, 2010.

[11] S. Ada, "SMEs' e-commerce adoption: Perspectives from Denmark and Australia," *Journal of Enterprise Information Management*, vol. 22, p. 152, 2009.

[12] A. Lenart, "ERP in the cloud – Benefits and challenges," in Wrycza, S. (ed) *Research in Systems Analysis and Design: Models and Methods*, Heidelberg, Germany: Springer Verlag Berlin, p. 39-50, 2011.

[13] B. Johansson and P. Ruivo, "Exploring factors for adopting ERP as SaaS," *Procedia Technology*, vol. 9, p. 94-99, 2013.

[14] Aberdeen Group, *SaaS and Cloud ERP Observations*, Aberdeen Group, December, 2012.

[15] G.A. Welker, T. van der Vaart and D. Pieter van Donk, "The influence of business conditions on supply chain information-sharing mechanisms: A study among supply chain links of SMEs,"

International Journal of Production Economics, vol. 113, no. 2, p. 206-220, 2008.

[16] S. Sarker, S. Sarker and A. Sahaym, "Exploring value co-creation in relationships between an ERP vendor and its partners: A revelatory case study," *MIS Quarterly*, vol. 36, no. 1, p. 317-338, 2012.

[17] K.S. Candan, K. Seluck, W.S. Li and M. Zhou, "Frontiers in information and software as services," *Proceedings of the 25th IEEE International Conference on Data Engineering (ICDE'09)*, Shanghai, China, p.1761-1768, 29 March2 April, 2009.

[18] J. Lewandowski, A.O. Salako and A. Gracia-Perez, "SaaS Enterprise Resource Planning Systems: Challenges of their adoption in SMEs," IEEE 10th International Conference on e-Business Engineering, IEEE Computer Society, p. 56-61, 2013.

[19] T. Hempell and T. Zwick, "New technology, work organization and innovation," *Economics of Innovation and New Technology*, vol. 17, no. 4, p. 331-354, 2008.

[20] H. Yang and M. Tate, "A descriptive literature review and classification of cloud computing research," *Communications of the Association for Information Systems*, vol. 31, p. 35-60, 2012.

[21] E. Zainuddin and P. Gonzalez, "Configurability, maturity, and value co-creation in SaaS: An exploratory case study," *Proceedings of the 32nd International Conference on Information Systems*. Shanghai., 10-14 December, 2011.

[22] T.Wielicki and L. Arendt, "A knowledge-driven shift in perception of ICT implementation barriers: Comparative study of US and European SMEs," *Journal of Information Science*, vol. 36, no.2, p162-174, April, 2010.

[23] F.D. Davis, R.P. Bagozzi and P.R. Warshaw, "User acceptance of computer-technology – a comparison of 2 theoretical models," *Management Science*, vol. 35, no.8, p. 982-1003, 1989.

[24] I. Ajzen, "The theory of planned behavior," *Organizational Behavior and Human Decision Processes*, vol. 50, pp. 179-211, 1991.

[25] E.M. Rogers, *Diffusion of Innovations*, fourth edition, New York: Free Press, 1995.

[26] L.G. Tornatzky and M. Fleischer, *The Processes of Technological Innovation*. Lexington, MA: Lexington Books, 1990.

[27] T. Oliveira and M.F. Martins, "Literature review of information technology adoption models at firm level," *The Electronic Journal Information Systems Evaluation*, vol. 14, no. 1, p. 110-121 (available online at www.ejise.com), 2011.

[28] K.K. Kuan and P.Y.K. Chau, "A perception-based model for EDI adoption in small business using a technology-organization-environment framework," *Information and Management*, vol. 38, no. 8, p.507-521, 2001.

[29] K.M. Eisenhardt, "Better stories and better constructs: The case for rigor and comparative logic," *Academy of Management Review*, vol. 16, p. 620-627, 1991.

[30] H.K. Klein and M.D. Myers, "A set of principles for conducting and evaluating interpretive field studies in information systems," *MIS Quarterly*, vol. 23,no. 1, pp. 67-94, 1999.

[31] R. Yin, *Case Study Research: Design and Methods*, Fourth edition, Sage publications, London, 2009.