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# *Analysis of various ERP Models on Premises and Cloud*

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*Abstract*-- **The purpose of this thesis is to clarify several ambiguities which surround the cloud ERP and the on-premises ERP systems. The main idea is to shed light on trade-off between cloud ERP and ERP in the companies' premises based on cloud outsourcing services, focusing on small and midsized manufacturing companies. Various Enterprise Resource Planning (ERP) providers have proved that ERP has improved the quality and efficiency of numerous companies´ businesses. ERP systems also provide a real time support to managerial decision making. Most of the ERP systems combine all departments and business functions of the entire company into a single shared system. An ERP system helps companies to manage and integrate business activities such as planning, purchasing, inventory, sales, marketing, finance, human resources, etc. ERP enhances company´s agility and flexibility allowing different parts of the company to communicate with each other, sharing information and becoming more cohesive. The ERP system is usually installed in the companies´ computer network infrastructure.**

***Key word: ERP, Cloud Computing, Web Mining, Rapid Minier***

**1 ERP based on on-premises business model:**

Different information system researchers refer to traditional ERP as ERP system on-premises. The traditional ERP system is based on on-premises business model. This means that ERP software or system is shipped to the customer after testing it and installed in the customers´ local computers. Based on on-premises business model, D'souza et al (2012) recognized that all services related to ERP have to be maintained by the owners of the ERP in their premises, service includes provision of hardware, hosting, deployment and configuration updating of the ERP system. The ERP system is in general installed more or less in all company´s computers. In case the company has subsidiaries either in same country or in foreign countries - case of corporate companies -same system can be installed in all company´s computer abroad. The ERP main advantage is: all users or employees with ERP literature can communicate easily through intranet or via internet.

**2. ERP based on SaaS business model**

This section starts by giving the reason behind offering ERP in form of SaaS which is based on SaaS business model. Then define this business model and try to link it to the outsourcing concept. The second part of this section gives price comparison of ERP SaaS versus ERP on-premises based on real example from ERP provider.

Implementing ERP system on-premises is proven to be expensive and time consuming. Enterprise software modules are frequently extremely expensive and very complicated to manage for most of the companies. Consequently, this has pushed the ERP providers to create new services called ERP as SaaS.

**3 Cost of ERP SaaS vs. cost of ERP on-premises: practical example**

According to Boyum IT (2013) who implemented and supported SAP ERP for 15 years, the cloud ERP is cheaper than ERP on-premises as it shows in table 1.

**Table 1. Prices comparison of ERP on-premises and ERP on the cloud**

| Prices comparison of ERP on-premises and ERP on the cloud | | |
|---|---|---|
| | Cloud ERP | ERP on-premises |
| 20 users | 2000 euros/month | 50000 euros |
| 30 users | 3000 euros/month | 75000 euros |
| 40 users | 4000 euros/month | 100000 euros |
| 50 users | 5000 euros/month | 125000 euros |

Source: adopted from an e-mail received from Boyum IT (2013)

The example of the price comparison is based on SAP Business All-in-One ERP package which is meant for small

and midsize manufacturing enterprises who desire to use ERP system. The prices increase as the number of users increase for both cloud ERP and on-premises ERP. The clerk of Boyum IT (2013) points out that:

"The on premises-column includes only licenses, prices does not also include the implementation
project, just licenses".

From the table 2 we can see that ERP based on SaaS business model is cheaper than having the whole system installed in the companies' computers, this will allow small and midsized manufacturing companies to benefit from using ERP in similar way as having ERP system built onpremises. But there are numerous aspects to take in consideration when shifting ERP to the cloud such as benefits and risks associated with cloud outsourcing services. From table 2 we can find annual cost saving if new customer chooses cloud ERP over on premises ERP as follow:

**Table 2. Annual cost saving when customer choose Cloud ERP over on-premise ERPP**

| Annually cost saving when customer chooses Cloud ERP over on-premises ERP | | | | |
|---|---|---|---|---|
| | ERP on-premises (€) | Cloud ERP annualy fees (€) | Annualy cost saving (€) | Annualy cost saving % |
| 20 users | 50000 | 24000 | 26000 | 52 % |
| 30 users | 75000 | 36000 | 39000 | 52 % |
| 40 users | 100000 | 48000 | 52000 | 52 % |
| 50 users | 125000 | 60000 | 65000 | 52 % |

Source: adopted from table 2-1

Table 2 shows that if new customer uses cloud ERP the saving cost can exceed 50% compared tothe on-premises ERP. These results are confirmed already by Mattison and Raj (2012) as well as Elis (2010) who explained the cost saving of using cloud ERP in the term of lower total cost of ownership.

**4 Literature review**

**Peter Schenkel, et.al. (2013),** Service provision of bricks-and-mortar services poses several challenges to the consumer. Finding a service provider as well as ordering and coordinating the service provision, requires intensive interaction between consumer and service provider. Due to the regional anchoring of these services, they are, to a large extent, provided by small- and medium-sized enterprises (SMEs). This poses additional challenges to the consumer: the market is fragmented and processes differ across service providers and industries. This problem is well-solved for tangible goods: consumers buy goods from different sellers via one marketplace (such as Amazon marketplace, eBay, etc.) and a seller-independent process. For services a similar consumer support is lacking. In this work the authors address the gap from a consumer's perspective by proposing a software architecture that integrates standard applications and modules to support the consumer process. While the work is still in progress, first practice applications demonstrate the artifact's usefulness and viability.

In this they developed a software architecture for bricks-and-mortar service marketplaces by deriving platform requirements strictly based on consumer needs. The consumer requirements are translated into technical requirements in due consideration of context-specific factors. The technical requirements are aligned to functional clusters (modules). Consequently, an architecture is proposed, which integrates modules and standard applications to cover the required functional scope.

**Doaa M. Shawky et.al. (2013),** Cloud computing is the latest computing paradigm that delivers hardware and software resources as virtualized services. To take full advantages of cloud services, there is a need to move legacy software systems to the cloud. Migrating legacy applications to the cloud is a non-trivial task as it leads to new technical challenges. The main problem in mapping software applications to cloud services is selecting the best and most compatible software components to ensure a cost-effective model. When selecting components to migrate to the cloud, software engineers must consider many criteria and complex dependencies among other systems' components. Thus, a technique for locating components to be migrated without actually moving them is needed. To overcome these challenges, the authors propose an approach which can be used in the decision-making process based on a set of measurable factors in the pricing models of cloud providers. In the approach, coupling among different components of the system is measured. Then, a proposed cost measuring function is used to choose the optimal migration scenarios. The approach is applied to a real enterprise resource planning (ERP) system. Experimental results show the efficiency, applicability and easy adaptability of the presented approach.

**Rabi Prasad Padhy et.al. (2013),** Enterprise IT needs a new approach to manage processes, applications and infrastructure which are distributed across a mix of environments. In an Enterprise traditionally a request to deliver an application to business could take weeks or months due to decision-making functions, multiple approval bodies and processes that exist within IT departments. These delays in delivering a requested service can lead to dissatisfaction, with the result that the line-of-business group may seek alternative sources of IT capabilities. Also the complex IT infrastructure of these enterprises cannot keep up with the demand of new applications and services from an increasingly dispersed and mobile workforce which results in slower rollout of critical applications and services, limited resources, poor operation visibility and control. In such scenarios, it's better to adopt cloud services to substitute for new application deployment otherwise most Enterprise IT organizations face the risk of

losing 'market share' to the Public Cloud. Using Cloud Model the organizations should increase ROI, lower TCO and operate with seamless IT operations. It also helps to beat shadow IT and the practice of resource over-or under provisioning. In this research paper the authors have given two case studies where we migrated two Enterprise IT application to public clouds for the purpose of lower TCO and higher ROI. By migrating, the IT organizations improved IT agility, enterprise-class software for performance, security and control. In this research, they also focus on the advantages and challenges while adopting cloud services.

**Mahesh Srinivasan and Asoke Dey (2014),** Recent developments have created an opportunity for organizations to leverage Web-based technologies. Such organizational initiatives need to be supported by sound existing infrastructures based on well-functioning Enterprise Resource Planning (ERP) systems. Also, business processes in multiple organizations across the supply chain need to be integrated to forge tighter links, from raw materials to customers. This work examines the evolving relationship between ERP and e-Business. The authors study how organizations can gain competitive advantage by leveraging the complementarities between these two technologies. They present a framework of e-Supply Chain Management (e-SCM) which facilitates the integration of business processes across the supply chain. We also discuss the recent developments in the area of cloud computing and its impact on the Internet-enabled supply chain environment. Today organizations are facing increased pressures to meet the dynamic needs of the markets and customers. Such pressures from the environment require the organizations to find innovative approaches to be efficient and responsive to both customers and changing market needs. Organizations have traditionally relied on Enterprise Resource Planning (ERP) systems to manage key aspects of the Order-to- Cash cycle. ERP systems combine different business processes in the organization into one integrated solution. Also the Internet has helped proliferate new e- Commerce models which include Portals and e-Procurement platforms. Successful organizations have effectively adopted and leveraged these new e-Business solutions. They examined the evolving relationship between e-Business and ERP, and discuss how organizations can move ahead to gain competitive advantage by utilizing these two complementary technologies. ERP systems and e-Business technologies are not competitive systems and their greatest benefits can only achieved when they are used in agreement, complementing each other.

**Nicolas Nussbaumer and Xiaodong Liu,** Cloud computing has gained immense momentum during recent years and has ultimately become a viable solutions not only for larger firms, but also for small and medium-sized enterprises (SMEs). In order for smaller companies to stay competitive, many have therefore decided in favour of adapting cloud solutions. Given the multitude of issues and challenges that occur during the cloud migration phase, the researchers propose a novel framework that helps SMEs to master migration related impediments. In doing this several steps were carried out. Firstly, the work takes into account SME specific requirements and articulates their importance during the cloud provider selection phase. The elicitation was conducted using an extensive literature review, examining case studies, surveys and other publications. The results demonstrate that factors such as security, reliability, cost, performance as well as flexibility and service and support have a pivotal role to play and require close attention. Secondly, decisive attributes were defined that qualify business components and services as cloud-fit. Finally, the framework itself was proposed, which focuses on a systematic service-oriented approach and helps companies to analyse their existing business processes in the course of cloud migration. The framework was verified in its practicability using a concrete scenario and a subsequent prototypical cloud implementation. The main contribution of this work is the Cloud Migration Framework, which can be regarded as a step towards overcoming cloud migration impediments. Its novel combination of SME distinct needs, business service attributes and the service-oriented approach ensures that the focus remains on the unique strengths of the respective company. This is a crucial aspect for SMEs to stay competitive and successfully cope with an increasingly changing business environment. At present, the migration methodology does not consider the economic factors of the cloud migration. For the framework to become a fully-fledged tool that covers the whole migration life cycle, it is necessary to complement the model with economics-driven approaches that assess and evaluate the cost effectiveness of the migration

**5 Conclusion**

The purpose of this chapter was to define the idea behind an ERP system. ERP software is usually installed in the companies' computers and it is referred as on-premises ERP business model. The ERP system comprises a number of fully integrated business modules, which cover almost every feature of the company´s business activities and processes. The traditional ERP has a lifecycle which starts usually from system: design, installation, configuration, customization, integration, testing, deployment, operate, maintain and upgrade. These lifecycle steps can cause budget to overrun or misalign between the business and the software. In other hand the ERP based on SaaS business model is less expensive than the traditional ERP which is based on on-premises model. Most of small and midsized manufacturing companies can afford to use ERP as SaaS in similar way of having the whole system installed on-premises.

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