ADAPTATION OF SAAS IN BUSINESS INTELLIGENCE FOR SME

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Abstract

This research paper aims to widen the current state-of-the-art techniques of New Management Models. In recent years, the appearance of new web tools, the exponential increase in open-source, remote collaboration software solutions, and the new social and labor paradigms, make necessary a deep review of the traditional management models. It becomes necessary to move to a new management model based on innovation, the information and communication technologies, and the software that supports these activities. While the PC and its applications were conceived to increase the individual productivity, the services and applications based in cloud computing enhance teamwork and collaboration, since they are based on a shared platform. The cloud-computing reveals itself as a proper tool to bring enterprises closer to each other, facilitating the collaboration between them, especially when considering the Small and Medium Enterprises.

keywords —
cloud computing, management models, virtual platform, small and medium-sized businesses.
I. INTRODUCTION

The need for SMEs informatization of the data analysis as a core is stronger. The informatization development of SMEs has gone through four main stages:
(i) information publishing:
   Enterprises publish introduction and information of products with third-party e-commerce platform.
(ii) building an independent website:
   an independent domain can show the company’s overall impression and strength. E-mail and instant messaging system are used as methods of internal interaction and external interaction. So the stage improves marketing and customer responsiveness of enterprise.
(iii) SMEs participate in application services:
   build simple financial, marketing and administrative platform to achieve office automation.
In this research paper, the evolution of business models would be summarized taking into account, how cloud computing can influence the business management systems.

The issue can be approached from two points of view. The former how cloud computing can update the already existing business management systems, and the latter one - how cloud computing can launch other management system such as IT Service Management.

Nowadays Small Medium Enterprises have to face a wide range of challenges such as globalization, competitiveness, adaptability, speed of change, growth, technology and so on. Tackling these challenges successfully depends largely on the implementation of an effective management system that could exploit and develop the potential in a company. In general, the goal of business management systems is to promote growth and competitiveness of the company. However, the boundary conditions change with time and management. Systems remain unchanging or evolve more slowly, should therefore be updated to achieve their objectives.

Cloud computing can be an essential tool for the creation, development and growth of small and medium enterprises. The main reason for this is based on the fact that cloud computing has changed the Information Technology Service Business. Cloud Computing is an IT deployment model, based on virtualization, where resources, in terms of infrastructure, applications and data are deployed via the internet as a distributed service by one or several service providers. These services are scalable on demand and can be priced on a pay-per-use basis. Consequently, companies only pay for the IT services they consume. For this reason among other advantages related to cloud computing, there has been a radical transformation in the business world.

There is no bibliographical consensus about the optimal business management model; however, if there is a consensus about the need to use information systems in the company and the use of include rankings according to the management model to be used.

Another meeting point among the different bibliographical contributions is the use of the management of processes whose improvement could bring about an improvement in the indicators and therefore growth in business activity. In order to pilot the improvement of these indicators it is necessary to implement an IT solution of which there are many in the simple information repository with a search system as an entrance point to a social network that relates people and companies and offers services pursuant to those relationships and makes them possible. In general, the introduction of cloud computing will drastically reduce fixed production costs, changing them into variables and adapted to manufacturing needs. This act shall have a positive impact in competitiveness for all sectors where expenditures in information technology are crucial.

II. ARE SAAS & CLOUD COMPUTING INTERCHANGEABLE TERMS?

[I’ve recently tracked down one of the causes of much confusion about and wheel spinning in cloud computing: it stems from thinking that Software-as-a-Service – software you
get, largely, through a web application involving little or no on-premise installs, usually priced by subscription – counts as “cloud computing”. Cloud computing is “merely” what SaaS application (usually) run on]

"We see cloud computing as a very broad term that refers to building and running applications on the internet."
"Strictly speaking, the SaaS would be the service and cloud computing would be the computer layer running on the internet." The two terms are different and SaaS to a great extent is a subservice of cloud computing. Not all cloud applications are SaaS applications, but essentially all SaaS applications are in the cloud, and the cloud is strictly providing the computing power to run those applications, regardless of the type.

Cloud Computing Gets You to SaaS: All this cloud business is distracting us from the big-bagger, enterprise value of SaaS. If we are just replacing “worrying about the on-premise infrastructure we use to run your applications” with “worrying about the cloud infrastructure you use to run your applications, we’re not getting much but a short-term slash in costs.

**III. ISSUES OF SMEs INTRODUCING BUSINESS INTELLIGENCE (BI)**

BI, which is the English abbreviation of Business Intelligence, is technical collection that make better use of data to improve the quality of enterprises decision, is tools that can help users to make scientific decision for own business information, extracts and organizes useful information with modern information technology, helps users strengthening the Management, promotion of marketing and business development to make timely and correct decisions, and to grasp, analyze and discover new business opportunities.

BI software has previously only been adopted by large companies; these companies have mature data analyzer and large data warehouses. Business Intelligence (BI) has been discouraged by SMEs, for the following main reasons:

**A. High barriers to entry and maintenance costs**

BI market is under control of the four suppliers, who are Microsoft, Oracle, SAP and IBM. BI software of the four suppliers is too expensive; SMEs cannot afford the cost, so the ratio of performance and cost is relatively low for relatively less complex needs of SMEs. Actually, apart from buying the software, SMEs still need to configure a large database server and so on, such as facilities and technical support staff, result in continued to increase usage cost.

**B. Poor software usability**

Business Intelligence (BI) software is characterized by summary and analysis of various data sources. But more complex logic functions increase the operation difficulty for general staff of SMEs, the tremendous value which arises from the software itself cannot fully exploit.

**C. Lack of flexibility in service configuration**

The BI needs of SMEs is more simpler than that of large enterprise, but the market positioning of the mainstream products and services are aimed at large enterprises, the breadth and depth of functional design are higher, which are not applicable to a changed analysis of simple decision-making requirements, and the software lacks of flexibility in on-demand configuration. All in all, there is the demand of data mining and analysis of SMEs customers too. But comparatively speaking, BI needs of low complexity, price and ease of use and the other are the focus of their consideration. From this perspective, the online software service model facilitates SMEs to introduce Business Intelligence (BI) applications.

**IV. BUSINESS MANAGEMENT MODELS AND THE NEED FOR INDICATORS**

Management system refers to what the organization does to manage its processes or activities, so that its products or services meet the objectives it has set itself, such as: satisfying the customer's quality requirements, complying with regulations, or meeting environmental objectives. Management system standards provide a model to follow in setting up and operating a management system. This section attempts to provide a general vision of the progress of these systems to date without attempting to be exhaustive, only looking at their common characteristics.
The ISO 9000 standards have potentially been one of the quality management systems that have come into being to the greatest extent within companies. This quality model is focused on control of the product and management procedure value chain that support these processes and cause them to be improved. The Plan – Do – Check – Act (PDCA) cycle is the operating principle of ISO's management system standards. It shows the need for some elements that will help us to measure results obtained to be able to value the fidelity of the different processes. This need is increased with the transition from the UNE-EN-ISO 9001/2/3:1994 to the UNE-EN-ISO 9001:2000 standard which emphasizes deployment of objectives and indicators.

The total quality management models or models of excellence arise with the goal of obtaining a management system that assures management and results quality including quality assurance system available that assures product and service specified requirements but also includes customer satisfaction, management of all company processes and the optimization of resources. Such excellence in management should lead to some excellent results in the broadest sense of the term, including accounting for results.

There are models of excellence developed by diverse authors, applicable to different models and companies customized by the companies’ themselves. The most accepted models are:

A. Malcolm Baldrige (1986)

Based on the United States National Quality Award. The model emphasizes the approach of systems to reach alignment of goals. The criteria are linked by means of cause-effect relationships.

B. Deming Prize

Deming Prize”. National Quality Award of Japan. These prizes are based on how the company manages all activities, research and development, design, purchasing, production, inspection, sales, etc., that are essential for adequate quality control for its products and services.

C. EFQM Model

European Model for Quality Management. The EFQM Excellence Model is a non-normative model, whose basic concept is the self-assessment based on a detailed analysis of the performance management system to guide the organization using the criteria of the model, which aims to help organizations better acquainted them-selves and, in consequence, to improve their per-formance.

D. The Balanced Scorecard (BSC)

It is considered to be one of the most important planning and man-agreement models in recent times. It was created by S. Kaplan and David P. Norton (2008). This model is based on the translation of strategy defined by the company, in related objectives, measured by the indicators that allow for creation of action plans that join together behavioral criteria with all members of the organization. The BSC has been recently qualified as one of the most important and influential business management approaches in the last 75 years and has been adopted by more than 50% of the largest North American companies, even exceeding the most optimistic predictions published by the Gartner Group in 1997 (Kaplan 2008).

E. The Tableau de bord (scorecard)

It is the original measurement system. It is based on methodology enacted by Rockart about critical success factors. The main nexus of union between BSC and the scorecard or tableau de bord lies in measure-ment. (Bourguignon et al. 2004). The BSC’s end objective is the correct implementation of strategy by means of a discipline of definition of objectives, effectively related and aligned based on it. The tableau de bord or scorecard will enter the scene below, meaning once those objectives or Critical Factors are defined, the following step is the determination of adequate indicators for correctly following the undertaking.

The Scorecard concept comes from the idea of configuring an information diagram whose objective is to adequately diagnose a situation. It is defined as the complex of indicators whose periodic tracking shall allow for there to be greater knowledge of the situation of the company or industry.

F. Six Sigma process

In 1986 Motorola created a Six Sigma process as a goal to reach company goals in substantially improving quality in five years. Today it is used by leading worldwide companies to guide their initiatives for customer satisfaction, continuous improvement, and cost reduction.(Kwak, Anbari 2006). The Six Sigma methodology used currently has become a tool to improve results and incorporate-rate many elements of the Total Quality strategies, in addition to the statistical base that it had in its beginnings. This would thereby constitute an extremely powerful management tool that allows companies to achieve considerable economic savings while simultaneously improving customer satisfaction, all in a short period of time. For this, management identifies those projects that have the greatest economic impact and assigns the best professional after training them intensively to work in such projects.
G. The Reengineering of Processes

The Reengineering of Processes and Total Quality Management constitute two different and complementary manners of management in an organization. Their paths cross at the beginning of the 1990s when Reengineering came up (Grover, Malhotra 1997; Davdačienė 2008). Total quality management has started, to say it is since the end of the 1960s and start of the 1970s. Both methodologies have experienced unequal development in industrialized countries. While total quality management has been relatively uniform, making its way through Japan, the United States, and Europe, the same cannot be said about Reengineering of processes. We can find examples of its application in many very diverse fields such as university education or aeronautical industries (Rio-Belver et al. 2009; Rio-Belver, Contreras-Romeral 2009).

All management models analyzed have their common base in management of processes and the majority use information tools that allow them to measure their results. They are based on indicators that fuel the scorecard. For the most part the indicators are obtained by means of information technology use implemented in the company; there-to, to manage the processes effective information technology solutions are needed with functionalities that better express their competitiveness, are scalable, modular, and affordable for SMEs. These tools are experiencing a revolution with the application of web 2.0 and the cloud computing concept. This fundamental technological revolution will affect business management systems.

V. BUSINESS INTELLIGENCE (BI) APPLICATIONS OF SMEs BASED ON SAAS MODEL

SaaS is a software distribution model, which is designed specifically for Web delivery and is User-friendly by Internet hosting, deployment and access. SaaS providers build information platform for enterprises which needs all network infrastructure and software, hardware, and is responsible for the implementation of all pre-maintenance, post-maintenance and a series of service, so enterprises do not need to purchase hardware and software, not need to build computer room and recruit IT staff, only need to pay a small rental management fees, then the user access operating platform via Internet ,and can easily enjoy related facilities such as the online office management, customer relationship management, enterprise project management, financial management, e-commerce and other information technology, and other hardware and software investment is no longer required.

As SaaS is the integration applications of enterprise management which includes network technology, software technology, electronic technology, the advantages of which SMEs use such a solution is more obvious, such as the open service, the management of succinct setting, the deployment of low cost and so on. According to the survey of IDC on “whether applications ERP based on SaaS is willingness” ,59% of small enterprises, 44% of medium-sized enterprises are currently considering SaaS. Business Intelligence (BI) is software (SaaS) of service, which can quickly provide a standardized analytical tool kit. and the majority of users can get services under not having time, costs and Business Intelligence (BI) infrastructure. The software can solve the difficulties of the initial introduction of SEMs BI. Specific advantages are:

A. Substantially Reduce Costs

SMEs only need a simple registration, they will be able to access web on the support of BI services, save the cost of software acquisition and ongoing maintenance costs. The method greatly reduces the barriers to get BI services for SMEs. In the case of SAP Business Objects BI On Demand, BI On Demand is divided into three versions: personal, basic and high edition. Personal edition is completely free, the monthly fee of basic version is more than 20 euro’s per user, high version costs more than 60 euro’s per month. So performance-price ratio of the method is higher than that of Millions of investment.

B. Usability improvement

To SAP Business Objects BI On Demand solution as an example, User without relevant experience or training can get started, and they can access data from various sources and retrieve visually through the SAP Business Objects Explorer software .Even the most ordinary employees can also combine data by clicking the mouse, and then generate and analyze reports through a detailed user instructions.

C. Flexibility of multi-level service configuration improvement

Through the business requirements of SME taking hierarchically, standardized classification and tiered pricing, according to current requirements of enterprises, they may
choose succinctly, so can provides a flexible configuration of cost and value.

The new IDC report shows: although the actual total revenue is still small in compare with BI applications of enterprises, BI market growth rate of the SaaS will triple, and the average growth rate can reach 22.4% by 2013.

VI. BUSINESS PERSPECTIVE OF CLOUD COMPUTING

The emergence of the phenomenon commonly known as cloud computing represents a fundamental change in the manner in which IT services are generated, developed, deployed, adapted, maintained, and compensated. In this type of computing – cloud computing – everything an IT system can offer as a service, in such a way that users can access the available services “in the Internet cloud” without knowledge (or at least without being an expert) in management of resources that they used.

Cloud computing is a general concept that incorporates software as a service, such as Web 2.0 and other recent software, also known as technology trends, where its common point is the trust in the Internet to satisfy the needs of user computing. As examples of cloud computing Amazon EC2, Google Apps, eyeOS, and Microsoft Azure are noteworthy, providing common online business applications accessible from a web browser, while the software and data is stored on servers.

A. Web 2.0

The following is the basic definition of Web 2.0. all those Internet utilities and services that are held in a database, which can be modified by service users, whether in their content (adding, changing, or deleting information or associating data with the existing information), whether in the form of presenting it or in simultaneous content or form.(Shang et al. 2011). Web 2.0 technologies can increase organizational effectiveness, efficiency and usability for company knowledge management systems (Antonova et al. 2009).

The promoters of the approach to Web 2.0 believe that the use of the web is oriented to interaction and social networks, that it can serve content that takes advantage of the effects of networks, whether or not it creates interactive and visual websites. This means that Web 2.0 sites act more as meeting points, or websites that depend on their users, rather than traditional websites. The Web 2.0 infrastructure is very complex and evolving but it includes server software, content redistribution, message protocols, navigators based on standards, and various client applications.

The international market for this type of systems is growing tremendously, equal to the number of users of the so-called Web 2.0. In addition, there are more companies every day who gear themselves to this market as a differentiation strategy and a way to get new customers. This statement is founded on the fact that the Internet penetration figures in Europe provided by the Internet World Stats organization in March, 2011 is at 83.8% and at 31.8% penetration for the social network Facebook.

Social networking introduced novel collaboration paradigms between network users and serious study is conducted on the use of such platforms for internal business purposes. However, one of most prominent research challenges is how to use social networking for external communications, customer support and of course, targeted marketing.

The companies look ever more to “the cloud” to follow social developments. It will be in the interest of business enterprises to deploy some of these paradigms (social networks, blogging, and open source) within their environments and with business intentions. The “cloud”, “cloud computing” is an attempt to standardize an already existing situation of interoperability among applications and distributed services. It is currently getting a strong push and is highly supported since it provides the best services to support the business. The business can now stop trying to understand and worry about IT capabilities and concentrate on what they do best. The recognized advantages are:

- Simplified IT management process
- Improved end-user experience
- Decreased IT performance Challenges
- Reduced the cost of infrastructure
- Alleviated internal resource pressures.

The primary beneficiaries of this system are the small medium enterprises, the Educations Insitutions; The cloud alternative is excellent for educational institutions due to sharing of services, reducing the investment necessary in information technology and increasing collaboration between students and professors. From a business standpoint this new cooperative, collaborative, and social work system with shared services will result in business management of the same manner, making it more shared and participatory, at the same time reducing information system costs. It will reduce the costs of reources and increase aspects of globalization. Citing some data, research conducted by Easy net Connect has
shown that United Kingdom small medium enterprises are increasingly eager to adopt cloud computing, with 47% planning to do so within the next 5 years. Of those companies which indicated their preparedness to move to cloud computing, 35% of them cited cost savings as the key driver.

Cloud is likely to be an attractive option for many small medium enterprises, particularly in the current global economic crisis, due to its flexible cost structure and scalability. Cloud Computing can offer several advantages to SMEs. The main advantages can be divided into three types:

- **Strategic advantages**
- **Technical advantages**
- **Economic advantages.**

**A. Strategic advantages**

Strategic advantages such as productivity improvement. Increasingly, there is a need of team-work. All digitized service infrastructure must be accessible anytime, at any device, at any connection and from any place at a reasonable and affordable prize. In principle, it is what we expect from the internet, but in reality it sets a number of demands. These demands relate both to the physical infrastructure and to the various aspects of the usability of the provided services. Services must be available seamlessly at any device and anywhere.

**B. Technical advantages**

Technical advantages in comparison with traditional systems such as flexibility. Companies only use the IT services they need at every moment. SMEs don’t have to worry about great costs in IT infrastructures and wasting time on their implementation. There is a better disaster resistance and resilience to failures. IT service providers have duplicate systems that reduce the likelihood of loss of information or service in the event of a disaster. This is a large benefit for SMEs, the majority of which are poorly prepared for hardware failures and disaster recovery. Cloud storage can reduce downside risks at low cost.

**C. Technical advantages**

Economic advantages, there is a cost reduction in purchasing new computer systems, maintenance and labor costs. While the proper design of cloud applications requires high-level software development skills, their maintenance and support is vastly simplified in the cloud environment. Cloud providers handle all maintenance and support issues for both hardware and platform software at costs that are either bundled configurations as premium services. This allows significant cost savings through reduced staff overheads. One of most significant technical benefits is energy saving. SMEs can dramatically reduce or eliminate local servers, cloud computing provides direct utility cost savings as well as environmental benefits

On the other hand, when SMEs adopt cloud computing solutions they should take into account the following issues:

**A. Security and privacy**

Security and privacy, how to ensure security, how to make access control, the data backup process, what happens when there is a data loss, it is meeting the data protection law.

**B. Availability**

What happens when there is a loss of internet connection, when there is an interruption of service and the economic damage related to them, it would be possible to work without internet access.

**C. Standardization**

It would be possible a quick and easy change to another provider, how to carry out a data migration. All these aspects are covered in service level agreement (SLA). In this regard, IT Service Management plays a very important role. IT Service Management (ITSM) is the set of processes that allow planning, organizing, directing and controlling the provisioning of IT services. Among the concerns of ITSM, namely within the service level management process, are the requirements for services availability, performance, accuracy, capacity and security, which are specified in terms of service level agreements (SLA).

Nowadays, the implementation of ITSM systems is a key element in the IT service providers. The main goals of a good IT service management should be to provide adequate quality management, to increase efficiency, to align business processes and IT infrastructure, to reduce the risk associated with IT services and to generate value chain.

**VII. Conclusions**

The small and medium company will be smaller, it will have less resources and more technology available at its reach at a lower cost. The management of processes is reduced, increasing management of people. These conclusions indicate to us that the business management models shall adapt the new company to its new indicators and the reduction of structure. Cloud computing is not a business management model in itself but in the future the term cloud management shall be introduced as a new management model for cloud companies.

The conclusions in regard to the greatest benefits of cloud computing for SMEs rely on the fact that IT service reduces costs and increases the flexibility to extend or decrease IT resources. As a result, SMEs are better suited to changing market needs. Cloud computing allows SMEs the implementation of new innovative ideas without investing a large amount of resources. However, to manage these competitive advantages, SMEs have to take into account the impact of this implementation, the best way to manage a successfully change to cloud computing without risks and taking advantages of its potential, it is establishing the most suited service level agreement (SLA) for the company. SLA should be developed jointly by the company and service IT provider. Consequently, it is also a fact that IT Service
Management is the small and medium company will be smaller, it will have less resources and more technology available at its reach at a lower cost. The management of processes is reduced, increasing management of people.

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BIOGRAPHIES

Govinda: Research Scholar doing research work under Business Intelligence for Small and Medium Enterprises (SMEs), Having Professional experience more than 4 years in Data warehousing and Business Intelligence technologies like Business Objects (SAP- BOXIR2) and IBM-Cognos BI. Currently working for Hewlett Packard (hp), handled different clients like NOKIA, Cablecom and Optus-Australia (Current Client) in Telecom domain. Expertise trainer for Data warehousing and BI technologies more than 2 yrs. Certified Member of IBM- Business Intelligence developers, Member of Innon-BI University and IEEE Member (2012), got awards for best service in current and previous Organization, Interest in Decision Systems, Open Source and its licensing criteria and Cloud computing for SMEs.