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# Cloudy Spine Meta-System Proposed Model in Small Businesses Process Management

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## Abstract

Cloudy computing by offering the scalable infrastructure and available capabilities as a service for small and medium-sized businesses has changed the game. It is a paradigm that computing resources are available anywhere and anytime and businesses can take advantage of it in the same way as they consume utilities like water and electricity. Due to the important role of small and medium-sized businesses in Iran economy, the aim of this study is to design a cloudy Spine for small businesses. According to the views of experts in the field of IT and cloudy computing, information and data in this field are collected by observing, preliminary and systematically interviews. Studies show that this business model provides a win-win solutions for small and medium-sized businesses provider and cloud service consumer. At the end, it is presented for the cloudy Spine model.

**Keywords:** Cloudy Computing, Meta-System, Cloudy Spine model, Small Businesses Organization

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## Introduction

In 2001 there were only 60 million transistors for every man and in 2010 there were a thousand million transistors for every man. One thousand billion mobiles with camera were sold in 2007 that this amount is 450 million more than in 2006. In 2011, two thousand millions individuals meet their needs in web and internet world, and in these years thousands of millions of objects, such as cars, cameras, highways and etc. was connected to the Internet. Accordingly, the world around us is getting more intelligent, smarter and smarter time to time.

Small and medium-sized businesses have the utmost importance in the economic growth of a country. These kind of businesses typically have small portions of ICT, therefore, so they more likely don't have access to skilled personnel, information technology and its sophisticated infrastructure and management tools. In addition, small and medium-sized businesses typically don't have research and development units in order to support from the research market functioning. This underlying condition, makes cloudy computing a potential and high cost tool in order to reduce costs and also by providing a valuable tool with well-defined services and provides other services and side information such as response times, peak business periods, failure rate, and error, automatic events logging which is provided by cloud, these all can improve decisions for businesses, these deficiencies are including of limited financial resources and human resources. These limitations, are weaken the small and medium sized-businesses toward large companies in the financial, planning, monitoring, education and information technology.

## The Concept of Cloudy Computing

Cloudy computing can be defined as a new computing paradigm which can temporarily let users enjoy their computing infrastructure on network. Cloudy computing is offered by the cloud provider as a service in one or more levels of abstraction (Youseff, 2008).

Buyya and colleagues suggest that "distributed and parallel computing cloud systems, which includes a series of interconnected and virtual computers, which dynamically provides resources and services and as one or more integrated computing sources according to an agreement of level-services, is offered through negotiation between service providers and consumers" (Buyya,2011). Convergence cloudy computing offers two major approaches in information technology:

1. Performance of IT in which modern computer technology gets much more efficient, which is used through the scalable hardware and software resources.

2. Business Agility, in which information technology can be used as a competitive tool through rapid deployment, parallel batch processing, using business analysis in a focused computing way and mobile practical-interactive programming that in real time response to customers' needs (Kim, 2009).

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According to the definition of the International Institute of Standards and Technology, cloudy computing is an accessibility to a set of computing resources in terms of demands, an encompassing solution that offers all computing resources quickly (hardware, software, networking, storage, etc.) based on users' demands. Cloudy computing services by providing available computing services through methods similar to utilities such as electricity and gas over the Internet, offers and promises major changes in business and information technology (Mell, Grance,2011). This is a definition that is expressed in standard and formally way and can be considered as reference in this study.

## Types of Cloudy Computing Services

Cloud-based services based on the abstraction level of the provided functionality services are divided into three groups:

1 -Infrastructure as a service - IaaS

2-Platform as a service - PaaS

3- Software as a service- SaaS (Mell, Grance, 2011).

Figure (1) shows cloud layers from physical infrastructure to applications and programs. These levels of abstraction can be seen as a layered architecture where the upper-layer services can be composed of a lower layer (Youseff, 2008). Buyya and his colleagues' reference model, shows the role of each layer in an integrated architecture (Buyya, 2011).

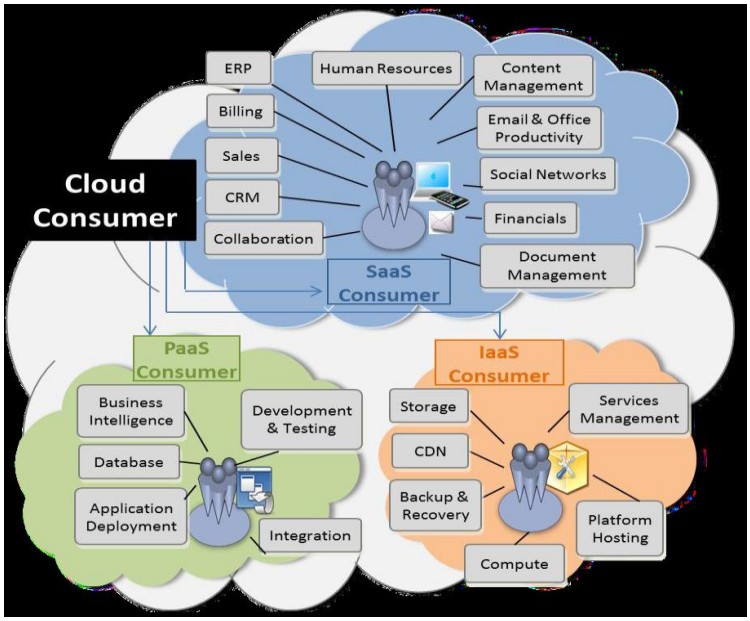


Figure 1. Cloudy Computing layers (Hogan, 2013)

Following properties described from the cloud economic perspective.

- Elasticity capability of cloud will lead to an automatically scalability of computing resources that will lead to a reduction or increase in the services based on demand that is counted as a type of forward planning.

- Rapid deployment resulted by the more efficient development of life cycle, because the production systems easily can be implemented.

- Infrastructure Abstraction and easiness in accessing to applications will lead to an independency of provided services from the location and devices. This benefit enables faster procurement and integration services through a web interface with the lower risk.

- Multi-tenancy provides a situation in which one sample of application runs simultaneously for multiple users. A full or partial Multi-tenancy means that the cost of storing, editing and enhancing customer service is divided.

- Quality of cloud services ensures providing a timely delivery at any time through effective use of the resources. Service availability and scalability obtained through replication, distribution and load balancing data.

These features significantly improve the technical performance through more efficient utilization of resources and cost-efficiency, by lowering the impact of costs in edition and lowering the entering and procurement costs and reducing the consumed time to make value. Of course all this depends on the scale cloud deployment model (Dubey, 2007).

## Cloudy Computing Accountable Agility Organizations

Weiner (1948) released Cybernetics as feedback and control in biological and mechanical systems. In the cybernetic model, the focus is on the control and command feature in the organization. The key feature which is commonly called management (Beer, 1979). Beer (1975) argued that the organization which is likely to be active in their environment probably have the complexity, probabilism and homeostasis, in which the organization used suitable cybernetic methods for the analysis (Beer, 1979).

Is there any winning business model that other companies can use it? What kind of architecture system of information technology can have the best support for this business model?

The Business model which accountable companies are used, gives their business units a high degree of autonomy in the way of how to access the business objectives and they are constantly working to explore the market and encourage them for new opportunities. Business units in these kind of organization rather than hierarchies are organized into networks. This process, released business units to deal with those tasks so that they can be focused on activities that generate revenue for them. It also enables the company to take advantages and benefit from the scale economies in providing the support services. And these networks that run the structures are supported through a combination of communicative and computing technology that provides and deliveries services at any time and any place on the Internet. This combination of technology and

services are the same cloudy computing. The agility and responsive organizational structure is shown in Figure 1 (Hoffman, 2013).

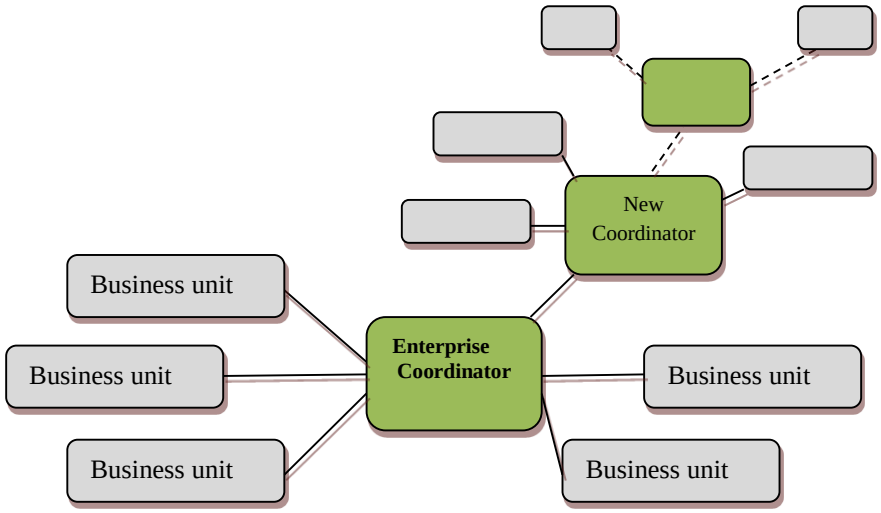


Figure 2: Growth of agility organizations (Hoffman, 2013).

## Characteristics of the Cloudy and SMEs

Small and medium-sized businesses increasingly rely on effective partnership with its supplier partners. Business services should be delivered in a reliable and predictable method, and this is a flow of information that is passed back and forth between small and medium-sized businesses through the cloud (Dababneh, 2007).

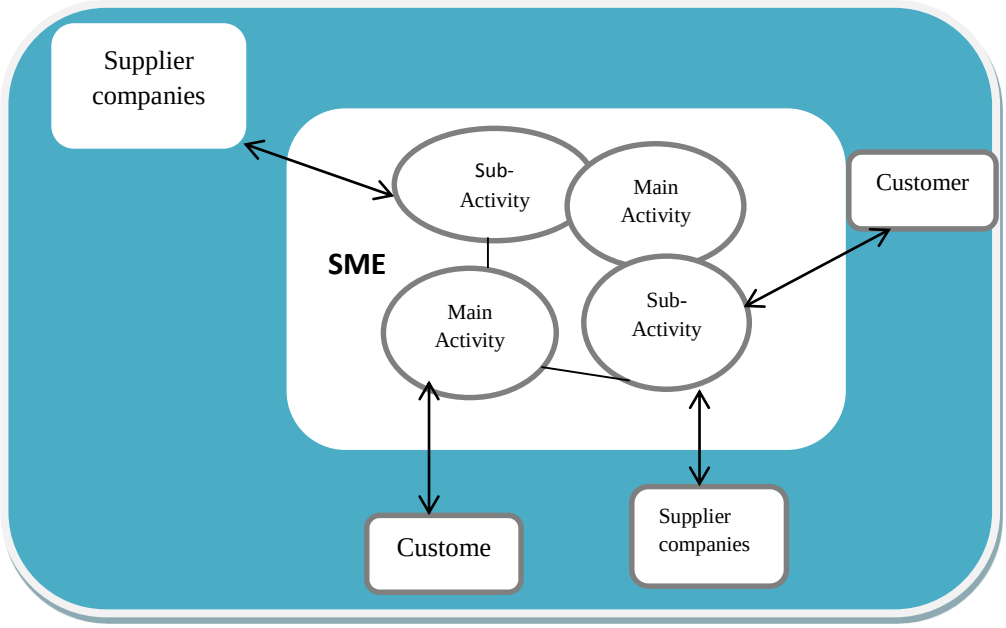


Figure 3. Small and medium-sized businesses and their relationships (Dababneh, 2007)

Small and medium businesses as usual in the case of the presence of the IT departments have small Information and communications, so they are likely to have not access to skilled personnel and to information technology and complex infrastructure and management tools. In addition, small and medium-sized businesses usually have not development and research units to support the functioning of the common research market. This underlying condition, makes cloudy computing a potential and a valuable tool to reduce costs and provides with well-defined services and provides other services like side information such as response time, peak business periods, failure rate, and error, automatic events logging, which cloud offers, all can improve business decisions.

The information technology unit is formed of many small and medium businesses as a simple personal computer, software, and sometimes local network. Opportunities of cloudy computing is integrated with Internet access. With the Internet, small and medium businesses, they can have more communication such as e-mail, web and e-commerce services with each other. Mail services with a custom domain name, for example, may be followed by a business at home by offering cloud services to be provided. Provided customized e-mail in business, however, need access to email's expensive servers. On the other hand, by reducing the cost of cloudy services, cloudy customized business email hosting providers like Google are already very low cost or even free items are available. Other factors that increase the competitiveness of cloudy services is including of increasing the needs of storage and issues of workforce management requirements.

In general computing needs of small and medium businesses depend largely on the nature of its business. From the three main services of, cloudy computing, business computing needs of SMEs in developing countries, the more focus is on infrastructure cloudy services options as a service and software as a service, toward platform as a service. The businesses that are involved in software development in developing countries are lower. Many alternative cloud-based software such as Office 365 are from Microsoft office Microsoft and Google Docs Google.

Now the major theme of information technology is cloudy computing. Because all data and applications on a computer when they can be stored in the cloud, so you can access them from any computer. Applications and cloud computing benefits for companies associated with the development of information technology in organizations, universities and industries. Despite the potential advantages offered by cloud computing, organizations are reluctant to accept it (Mathew, 2012). The following are the factors affecting the agility and responsiveness of small and medium-sized businesses.

- **Reduction of Fixed Costs:** In order for overcoming the uncertainty of the environment, small and medium-sized businesses should reduce their fixed costs. To survive, small and medium sized businesses need to achieve breakeven down to focus their operations.

- **Information Technology:** Exactly like industrial technology of the last century that created the assembly line which is offered the benefit from the economies of scale, agility and responsive organization of information technology in this century, causing the continuous respond which offers profits from the market and the customers' needs alternatives. Cloudy communications of data communications and Internet-based voice

communications applications that are hosted by a third party outside the organization, and makes them available to the public cloud (beer, 1979).

A simple classification of business systems in the business model are as follows:

1. Connecting systems
2. Adaptive Systems
3. Systems Customers

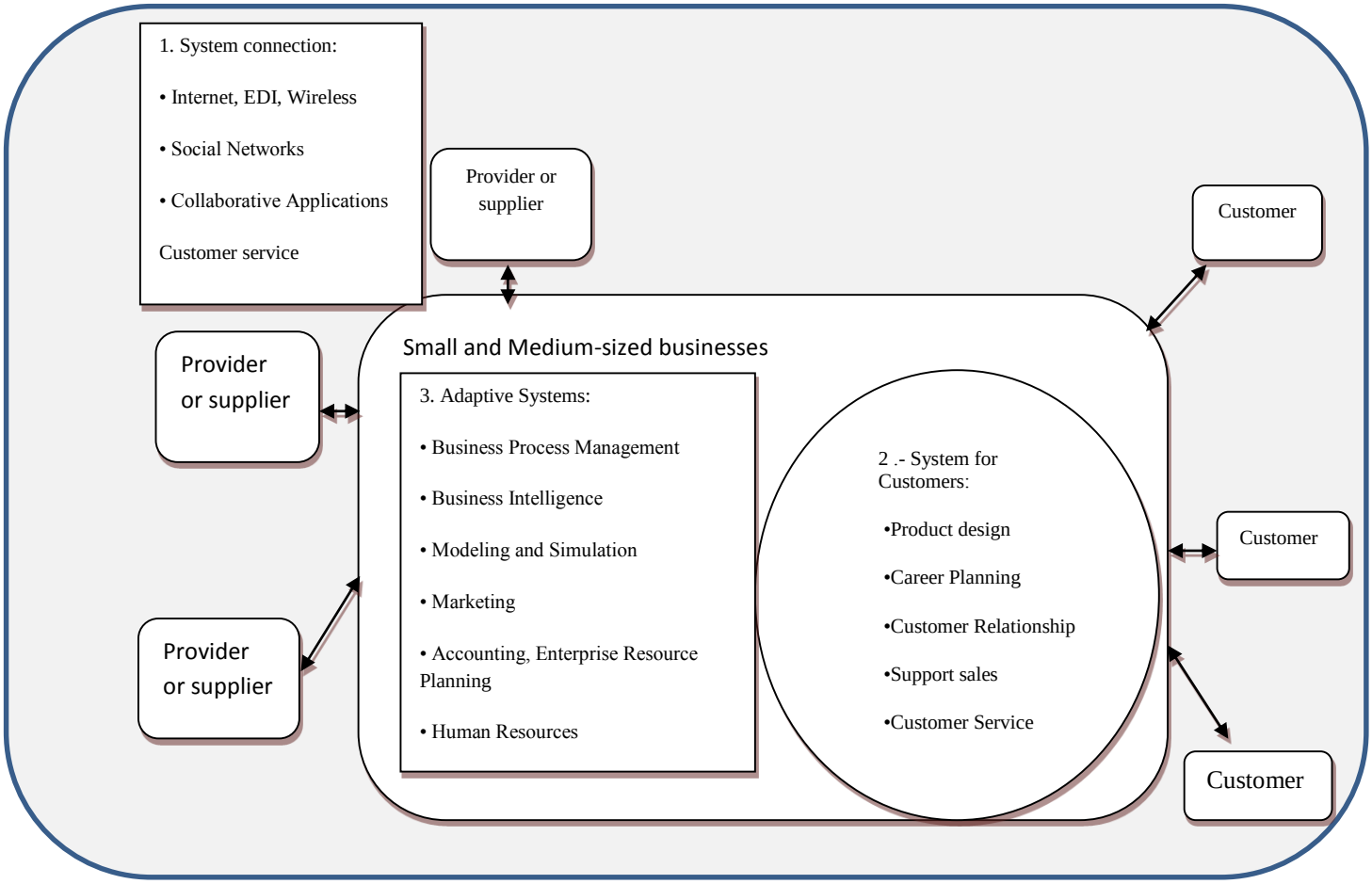


Figure 4. System of Small and Medium size Business (Beer.1979).

Meta system tasks of Stafford Beer (1975) are very similar to the performed duties which were done by the organizational coordinating in an accountable organization model. If we combine these two models and Meta system and coordinating tasks in the cloud technology, we will have cloud-based business model**.** We put Meta System and coordination tasks in the cloud, because they work collaboratively together and a there is a very effective cloud platform for cooperation between small and medium sized businesses around the world. Business intelligence and simulation systems in the cloud

can make all small and medium-sized businesses in network more visible and brighter so that they see the status of network operations in real time. Cloud business model for small organizations provides require systems for small and medium businesses in this structural study of agility and responsive for this type of organization and has two main components, cloudy Meta system which is the cloud of small businesses and it is the Spine of the cloud. The duties of a meta-system is planning and coordination of the business network and provides the use of business intelligence systems and simulation for small and medium enterprises.

- **Cooperation:** What makes a bunch of birds move as a single entity? There's more of a leader bird gets others to do something. This rapid and coordinated behavior of large groups of people, called the bunch-like move. What we learn about dynamics group movement is related to the way we do business in the real economy and governance structure.

## The cloudy Spine Model of Small Businesses Process Management

Modeling and simulation are new category of software which is used by large organizations to make better decisions, and these decisions have significant results in organizational operations and their profitability. Large organizations were used from simulation systems in order to make decisions about how the organization's operations should be done in circumstances which have never been faced with. Simulation systems provide a method to rapidly address the crisis.

Modeling and simulation systems which are offered through the cloud of small businesses, supports small and medium-sized businesses in the areas of production. The cloud-based simulation systems focused on technologies and innovative manufacturing processes which the need to simulation for them is based on clients requirements in order to strengthen the supply of the application and demand. Simulation services provides an achievement in scientific and technical excellence so that to have better products and systems with improved performance, quality and better durability makes it possible for small and medium businesses to have a faster and more efficient access in production for the design of the engineering services, prototyping, training and knowledge transferring.

This task of the cloud, productivity, adaptability and sustainability of small and medium sized businesses improve the production and through the delivery of simulation services systems in order to help the development of products and services to compete in the global industrial context.

Cloudy business model for small organizations provides require systems for small and medium-sized businesses in this agility and responsive structural study for this type of organizations and has two main components, cloudy Meta system which is the same cloud of the small industrial businesses and the cloudy Spine, which will be described in detail in the following cases.

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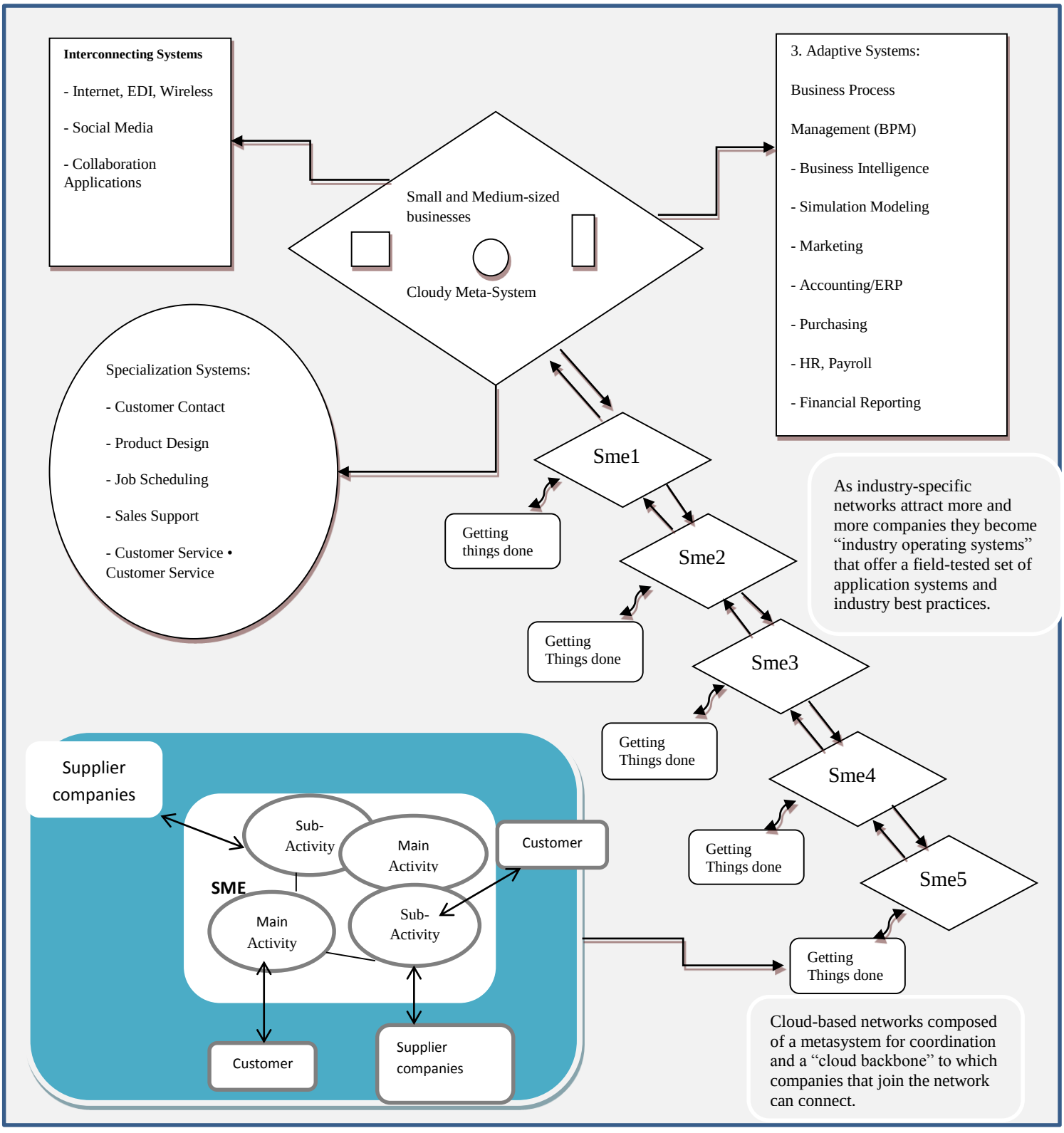


Figure 5. Cloudy Spine model of small businesses process management

A meta-system's duties are programming and coordination of network business and the use of systems such as business intelligence and simulation for small and medium businesses.

This business model is made of two parts; Meta system for coordination and cloudy spine that specifies which company should be connected to the cloud. Meta System's existing in this kind of business model, offers business intelligence and simulation systems to small and medium sized businesses and cloudy Spine used for communications and business process management systems that all of this will be described in detail in the following.

## Business Intelligence, Small Businesses, Cloud

Economic globalization has led to the globalization of information that makes every manager to quickly get to the counter to the unstable economic environment in which all operate to stay alive. Small and medium-sized businesses need to monitor their works and using all of their resources in an optimizing way, especially the information resources. Continual development of companies in the competitive environment requires appropriate decisions which are taken based on the information. The use of information and communication technologies is important for supporting and optimizing the internal processes of a company and its integration with e-business activities, it is important for all economic sectors.

Business Intelligence as a technique that company uses in order to identify, extract and analyze data for business such as income and expenses. Through business intelligence organizations can identify their customers and profitable future.

For small and medium businesses, aspects of business intelligence and decision support management are expressed differently. Many small and medium-sized businesses run by their owners and they are doing an analysis of the performance of the company's activities, less than detailed description of support system from the decision which means that they were used from the combination of information technology and communications in their infrastructure company which has been created before, and this support reduces the management's decision.

In the adoption of business intelligence solutions, we should consider the benefits which are caused by the supporting of decision, such as the quality of information provided by businesses, powerful tools to visualize and analyze the data, the cost to make decisions, based on availability, efficiency and effectiveness of the decision.

Typically, the barriers have costs and complexity intelligence for businesses to use the business. Costs include the cost of software tools, services and the cost of spending time and individuals. Small and medium businesses faces additional barriers such as low budgets, lack of knowledge and expertise, technological barriers and low, which means there is less time to analyze and plan in this respect.

## Cloudy Spine, Cloudy Communications

This type of business model provides the possibility to communicate and collaborate in the cloud because this model supports small and medium-sized business by transferring data in common and communication system, which can be connected to each other. Cloudy systems are well-defined based on APIs, so any company can use service-oriented architecture techniques to connect the interior systems in to this cloudy spine.

Cloudy communications of data and voice-based communications are Internet-based which are hosted the communication applications by a third party outside of those organizations and makes them available to the public. The service-oriented data is a vast word which is preferred in first degree that runs on the internet's infrastructure and it is available. Until recently these service-oriented data was the center basis but with the evolution of voice protocol over the internet, the voice is also taken account into the part of the cloud phenomenon. Cloud telephony is specifically referred to voice services, in particular the replacement of conventional business telephone equipment (such as station By PBE) with voice protocol services over third party's internet (Chang, 2007).

To implement management solutions of business process for every small and medium business, should analyze the causal relationships between factors affecting the adoption of information and communication technology, however, requires a suitable methodology for the analysis.

In the literature, there is significant gaps such as lack of analysis of the use of information and communication technologies in the management of business processes in organizations, regardless of the characteristics of small and medium-sized businesses in developing countries. Process management for the small and medium businesses are rarely considered and implemented. This question rises that is there any minimum time requirements for entry or for the business process management or is there any benefits come from business process management for the small and medium organizations or not. Business process management in small and medium organizations have essentially the same role in a large organization with the exception that the bed hierarchical structures of small and medium-sized companies, give this possibility to take decisions faster by managing the implementation of business process management. Lack of knowledge about business process management is the main factor in the declining of small and medium organizations. Moreover, some constraints for the implementation of business process management in small and medium-sized businesses are given below (Chong, 2007).

- Lack of financial resources
- Lack of time
- Lack of support From Senior Management
- Lack of expertise in Information Technology
- Poor knowledge of processing methods

However, buying a business process management system for small and medium organizations is costly, it's not only need software but in order to run the engine of process

needs hardware and also, they should allocate a personnel for operation and keeping these hardware and software. This business model of cloud gives this opportunity to small and medium businesses to use the available computing resources to manage their business processes based on the pay-per-use and they can get them indefinitely, furthermore, these businesses can benefit from the expertise services in division and communicate with them through the cloudy spine.

## Conclusion

Small and medium-sized businesses typically do not have information technology staffs or do not have the ability to deploy complex applications such as unified communications, contact centers. By working with a service provider, small and medium sized businesses can deploy professional applications in their own organizations.

Small Industries Organization can provide a special combination of value, reliability and earning in order to work both for their own benefit and for the benefit of small and medium-sized businesses operate.

Cloud also offers win - win solutions to both small and medium businesses and the small industrial organization as a provider of cloud services.

• Available tools and applications through the cloud of small industries provides a possibility to have a better services for the final customers for small and medium. Businesses. The lowest barrier to entry, flexibility, reliability, payment for the use that does not require heavy investment are facilities that make this model affordable for small and medium businesses.

- Small businesses organizations can attract the small and medium sized businesses with the delivery of cloud applications with improved features, attract new revenue.

For achieving success in the cloud, small industrial organization does not need clear strategy and framework for the management for new responsibilities. The organization must consider the control of costs throughout the life cycle of cloud solutions. They must also ensure that the virtualization capabilities, coordinate and continual automatic configuration, cause real prices and profit margins. An element that creates barriers for the implementation of this model will be funded.

Somewhat below information show the importance of small and medium sized businesses in the economy:

- The rapid and extensive changes of production technology in recent decades and distancing from mass production in giant industry and trends toward flexible production in small and medium-sized businesses, however it increases the capability of competing activities for small businesses and leads to transfer economic activities from giant industry to the small businesses, however, this issue does not have the meaning of elimination of giant industry and its replacement with small businesses, but the movement is toward the more interaction of these two with other and in the form of a chain

production. In such a way that the division of labor among small businesses and great ones is formed in a way that instead of competing with each other, they are completing themselves.

- Creating and supporting small and medium-sized businesses are one of the main priorities in the economy development program in many developed and developing countries. SMEs businesses in creating jobs and providing a suitable platform for innovation and increasing exports are important. Small and medium-sized businesses have more flexibility and more entrepreneurship and more creativity can be done in them.

- These firms can comfort and match themselves better with the accelerated environmental changes and in comparing to the economic and political factors reacts faster. Also, the recruitment and employment factors are the large and main part of the population of the country and training of the skilled workforce. Supplying specialist human sources for large firms can be conducted by these agents and firms.

Therefore the financial support approaches in Iran economy from the small and medium-sized businesses should be studied and investigated by considering the great economic board and the place of small and medium-sized businesses in the whole economic.

The other barriers in order for implementing this business model is the lack of appropriate bandwidth and speed at the present time. According to most experts, in the near future, national network of information could hinder the promotion of the country. Although conceptual studies on the National Internet design conducted at the Iran Telecommunication Research Center and then launching a national Internet project is underway, however, there are many ambiguities in this context.

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