Article can be accessed online at http://www.publishingindia.com

Using Cloud Computing in Software Firm:A Strategy to Improve Agility in the Current Financial Crisis

Subir Saha*, Mohammad Maruf Hossain**

Abstract

Software industry is a growing sector in economy and in the present financial crisis, software firms are facing problems in providing necessary support for research and development activities. The objective of this paper is to find alternatives to the use of IT (information technology) solution of software firm development. Agile development methodologies are very promising in the software industry. Agile development techniques are such a way of developing environment such that it is very practical and viable in understanding the flow of business environment changes constantly. Agile development processes optimise the opportunity provided by cloud computing by doing software releases iteratively and getting user feedback more frequently. The research methodology depends on Cloud Computing as an alternative to IT provision, management and security. It also took into account the best practices for Cloud Computing usage within software firms and software developers' experience in IT. The strategy includes five stages, with emphasis on the evaluation of data and processes/ functions/ applications from several major software firms based on some key criteria, while creating a correspondence between these aspects and the models/services/ applications that exist on the Cloud market. The outcome of using Cloud solutions in software firms by improving knowledge is impressive.

Keywords: Agile Methodologies, Cloud Computing, Software Development, Information Technology

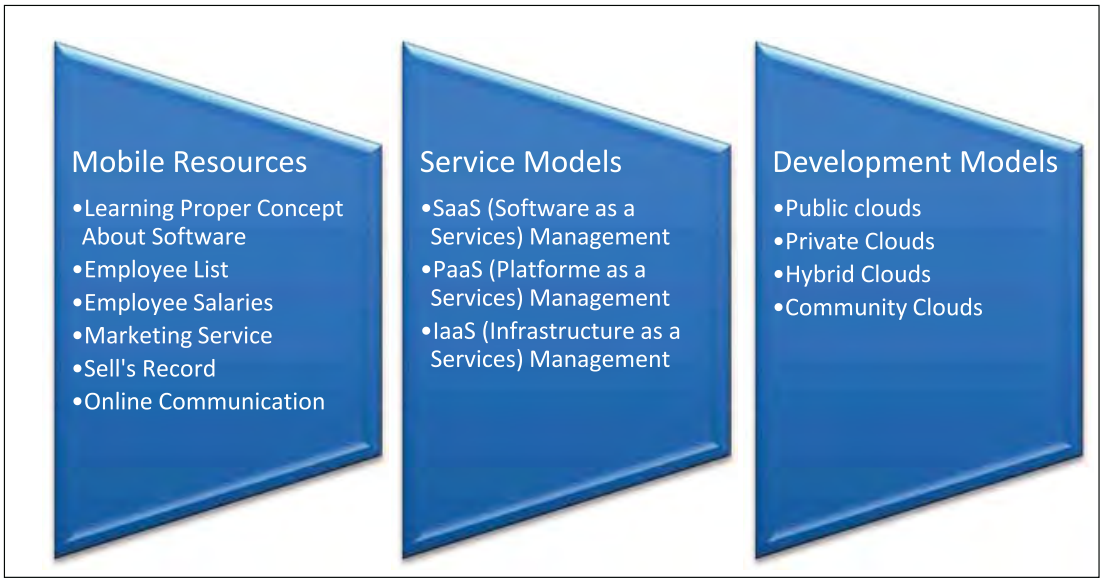
Introduction

Software development life cycle is divided in various steps. Project management is one of the important phases in the cycle and it continues throughout the development period; Agile methodology is one to manage projects. So, Agile methodology is very helpful for the software developer teams respond to the any unwanted situation throughout the development life cycle in software through incrementally and iteratively. Agile methods are light weight software schemes. Software development was acknowledged in time as one of the pillars of economic development (Mircea & Andreescu, 2011; Amber, 2002). The software developers have proven their contribution to the transformation of country economy. The tendency observed during the last few years within software firms indicates update of their IT (information technology) infrastructure as foundation for software development activities. Software firms are given specific services to provide form that must be found in online environment (Martin, 2006). We know that in a software firm, the maintenance cost of development is more than inflation rate. The inflation rate is an important note to be considered. It is increased in software firms, the development stops at primary level and the budget of software firm decreases. That leads to the pressure of finding some alternative way for solution. Cloud computing has provided an alternative to the use of IT for development environment, especially in the condition of the present financial crisis (Cockburn & Highsmith, 2001; Schwaber & Beedle, 2001).

* Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology & Pabna University of Science and Technology, Bangladesh. Email: ss.buet@gmail.com

** Department of Computer Science and Engineering, Pabna University of Science and Technology, Bangladesh. Email: nayem.cse08@gmail.com

Fig. 1: Cloud Architecture for Software Firm



Using Cloud Computing in Software Firm

Many software firms in the world have been recognised using Cloud computing for computing for the potential and efficiency of software firms. Cloud computing is an efficient technique wherein a developer goes through a development cycle of software. It is also very economic; though expenditure is one of the common drawbacks for quality software development. There are many software firms or organisations recently working on IT (information technology) implementation and reducing the complexity of development. Agile methodology is the best for use in software development. Many organisations all around the world are trying out various available agile development methods. Cloud computing refers to the provision of computational resources on demand via a computer network. Software development phase goes through some process, each process works dependently or independently. If we aggregate them in a cloud network then it will be feasible and this network of servers is the Cloud.

Cloud computingat software firm is viable because of:

- Easy combination with other enterprise solutions.
- Highly customisable environment.
- Quick deployment, coupled with less probability of failures.
- Optimum utilisation of in-house IT resources.

Cloud computing has gradually become a rage among companies around the globe. Cloud computing has become very popular among the developing environment in the software industry.

Cloud Architecture for Software Firm

The development methodology is based upon the thinking, planning and working. In the thinking phase the developers are concerned about the way how to solve the problem. It is also true that thinking phase is an abstract and virtual phase with no physical existence. But when the thinking phase comes to planning phase then a team works for a particular task and it also gets some physical existence. Types of technology; which are more feasible for that particular project are fixed. Cloud computing technique is integrated here to provide quality solution for the particular projects. In the working phase the software development is done for the users' use and all the viable techniques are properly integrated in complete quality software. Cloud environment provides network capacity, re-architecting, employee, and perception. The adoption of cloud architecture involves overcoming barriers. The adoption process of cloud architecture differs depending on the development segments.

In mobile resources some entities are used for cloud architecture in software firm. Learning proper concept about software means proper concept of programs which are essential for software development. Employee list, employee salaries, marketing service, and sell's record are available in the software portal. That creates a good attraction to the experience of developer and buyer. Online communication is must for mobile resources because IT (information technology) infrastructure permits businesses to run their applications on a shared data centre space. Globally cloud computing services and the resources are offered to software firms.

The services model provides collaboration with emphasizing the working ability and innovation. The successful use of cloud computing in software firms presupposes the existence of this model.

The development models manage service provider of the software firm Public clouds have no restriction for using data or information but private clouds have some limitations for using information. Public clouds have no customisation and control and can provide the services to anyone via Internet. On the other hand private clouds have customisation and control for providing data or information.

Hybrid clouds are also used in community to provide easy, efficient and effective service where it is needed. The hybrid is popular among software firms because at the same time one can use different architectures of software, platform, and infrastructure.

The community models appeared when business process and marketing services were going underpressure in development environment.

The pre supposed existences of three key elements are:

- Virtualisation
- Intelligence from network
- Robust ecosystem

These are provided for obtaining operational efficiency, security, activity continuous, scalability, and interoperability of a software firm.

Fig. 2: Architecture of Services Model

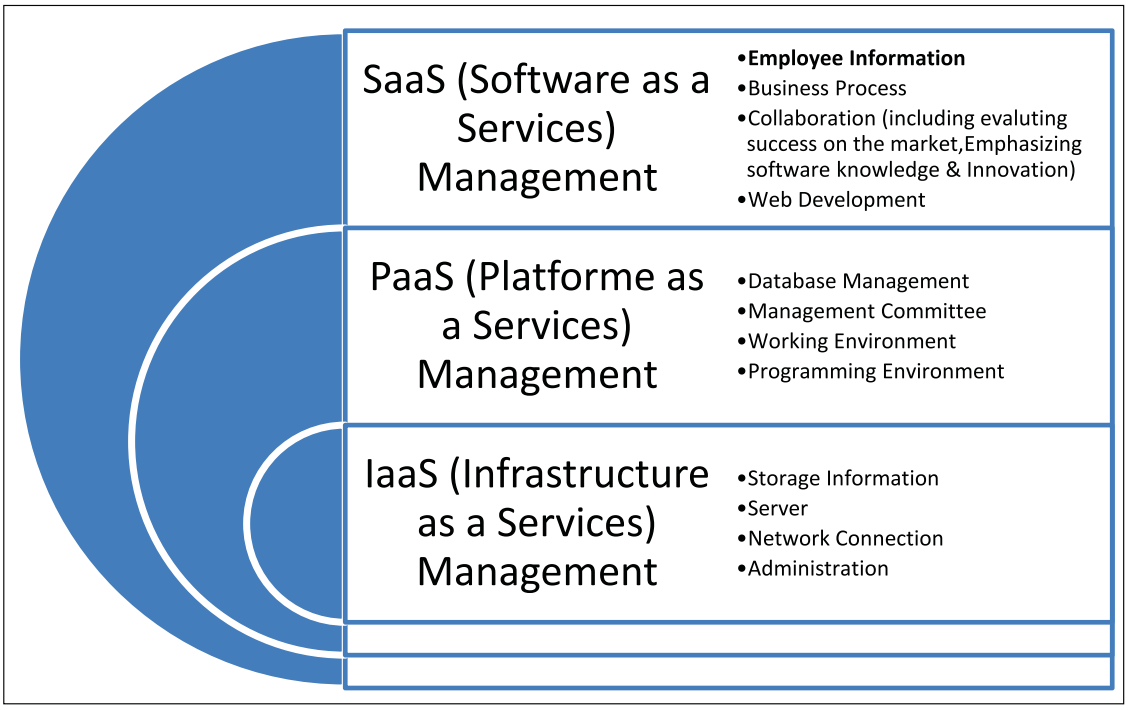
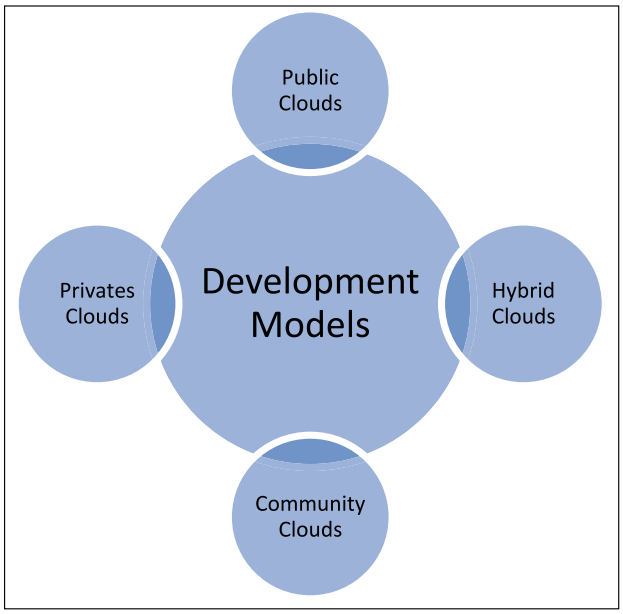


Fig. 3: Architecture of Development Models



A Cloud Adoption Strategy for Software Firm

A cloud strategy in software firm means a strategy that supports cloud computing capabilities. In a software firm many strategies are applied for rapid development but cloud strategy is used to maintain collaboration to reduce high cost & re-engineer the existing services of software firm.The important part of the strategy is IT strategy. This strategy rebuilds the relationship between employees, users, & management committee (vendors, developers etc.). The success of the strategy implementation depends on SOA (service-oriented architecture) & BPM (business process management). Without this, cloud has no sense from the financial view. This strategy also includes marketing service and online service. In order to have success, the cloud strategy must be aligned with the software firm strategy. That is, start from every staff must be increased with proper knowledge about cloud computing, progressing about marketing management & sell services. Firstly concern the researches related to the transition to cloud computing and the experience of several software firms using it. Cloud in software firm is used in variety of forms as shown in Fig. 5

Developing the Knowledge Base About Cloud Computing Cloud strategy in a software firm develops the knowledge base about cloud computing. The success of the phase depends on how resource are allocated to the employees, whether the used resource are sufficient for employees. There are some basic structural differences between an institution and a firm. A learner should concern about this.

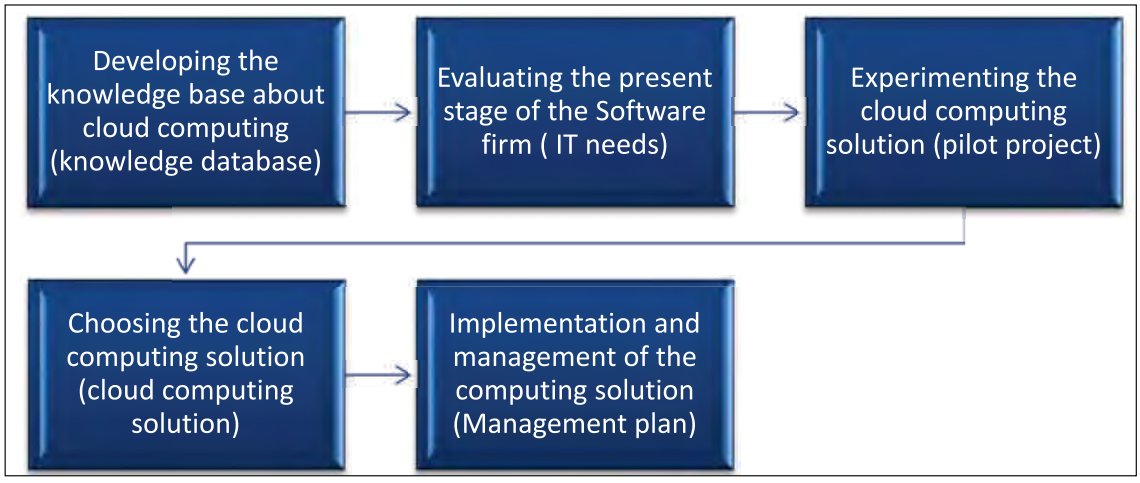
=>The benefits and risks

=>Policies

=>The best practices of cloud computing

The policies are conducted by the administration

Fig.5: Cloud Strategy in Software Firm



committee. Risks & benefits depend on overall progress of software firm. The update information is conducted by a team of IT service department who permanently communicates with the users of the solution regarding their objectives. Management committee should give practice opportunities to the employees for understanding the objectives, progress, cost & benefits of the cloud computing solution.

Evaluating the Present Stage of the Software Firm

It is the essential phenomenon of software firm. Evaluation the present stage of software firm is the point of view badly needed. The basic needs of software firm are IT needs, structure, and usages. The IT needs are IT infrastructure provided to employees and the users. SOA (service-oriented architecture) & BPM (business process management) represent the architecture of IT for understanding data services, processes, and application.

Online services are common phenomenon now-a-days. Employees andusers already use many of cloud technologies in their personal life. So it is not impossible to make them regular. The objective is to identify the emerging technologies, efficient from the point of view of cost that satisfy the necessities of the employees and administrator of software firm.

The three cloud models are SaaS (Software as a Service), PaaS (Platform as a Service), and IaaS (Infrastructure as a Service). The goal of a software firm is to make position in the corporate world. The attractive design of own website comes to near the goal because the informational software firm indicates new techniques and technologies for the users or customers. So developers may design & build the website that are executed on the infrastructure of the cloud provider and deliver that information directly from the server of the provider to the final user.

Then consider the mobile resources. It is a necessity of the software firm. All resources about IT services, employees & users are used for developing their concept about cloud computing. Provide the resource to the employees & users as per ability of the software firm. Learning about software development leads to the software firm in commercial challenge. To come up as one of the best software firms in corporate world, the administration adopts marketing techniques, like comparing the sells records of others, providing working environment in software firm where employees work comfortably, taking decision by Management committee for recruitment when it needs competent employees, maintaining the data for future, managing the storage of all information about software firm, which is beneficial in the cloud computing perspective.

Experimenting the Cloud Computing Solution (Pilot Project)

The better achievement of software firm comes gradually. All the operations will be done in cloud strategy ways, the transition to cloud may be achieved gradually. We can start this from testing a pilot project in cloud. A pilot project consists of setting some cloud target. The goal of the pilot project is to make profit, develop the environment, and maintain the storage data. For making profit all the operations of software firm are executed with proper utilisation of the resources. Developing environment depends on some internal operations that are always processing on a daily basis. The most important phenomenon of software firm is maintaining storage data. This data may be addressing, at the same time, components of public and private cloud in order to assure the security and protection policies. The secure data are more important for software firm. As a pilot project properly executes utilising resources, the solution must be in there. Sales and IT sector take advantages from this pilot project. The maintenance of project such as low cost for using the solution must be permanently considered in a software firm.

Choosing the Cloud Computing Solution (Cloud Computing Solution)

Cloud computing solution of software firm consists of identifying the suitable dataset functions and main processes that are essential for software firm. These topics can be in three large groups according of activities of software firm. These groups are:

=>Marketing

=>Administrative

=>IT (Information Technology) operations

In marketing sector there are some methodologies to apply

for maximum benefit. Sales teams here are the main factor to achieve the goal. To research the previous sales record of other software firms is more helpful for executing this process. Marketing techniques are also applies to cover the demand of users or customers. Online services maintain the quality of software firm. Administrative committee decides to create better environment for executing process of software firm. Which business process will overcome the tendency to reduce cost and achieve better is also decided by administrative committee. Collaboration includes evaluating success in the local and international market, emphasizing the software knowledge for development of software firm & innovation.

IT operations mean to maintain the structure or un-structure dataset about software firm. Database management holds the information of employees, employees' salary, and recent sales record of the firm. Data can be made more secure by this team. Server is also maintained in this process. Employee quality and employee achievement are also maintained in this process, representing the evaluation of the dataset identified in the process of cloud computing solution. Cloud computing is not only done in development phase, but it is also used to make the software easy to access. From one central machine many remote users can get the service with lower configuration than the service.

Implementation and Management of the Computing Solution (Management Plan)

Software is implemented after the developing life cycle. After the implementation, the software is open for service for the users. This results in providing cloud solution of the firm with the eventual return from cloud to internal operations of the firm. Implementation may be worked in two categories: flexible program of risk management of the firm for continuous growth and other is testing the solution of pilot project and employee's performance management.

The migration of the dataset, services and processes towards the cloud platform must be done based on some suitable strategies. Each migration model has some specific objectives that help in development of the firm. At the business process level there must be a management model that includes business policies, marketing technique, regarding security, management of the IT services, and risk management. The infrastructure and the continuous evaluation of the cloud computing solution also include the management model that proves the quality of software firm. An efficient management is essential for any process or program of quality management. By measuring the improving process we can say that the services performed of software firm is either good or bad.

To achieve an optimal goal of the firm, administration of the firm lays emphasis on the implementation and management of cloud computing solution.

Future Work and Conclusion

Despite its critics and drawback of using Cloud computing, it is the best solvable way for IT of a software firm. In our study we considered some specific field of software service and which is not common for all types of software. So, research can be done for generalising the use of cloud computing in software industry. In present economic condition software firm faces many economic problems to survive. Software firms are changing their techniques for a sustainable establishment. Cloud computing is a way where software industry can attain a sustainable development because it is easy to access, secured, and cost efficient. Already many software firms have been working with cloud computing technology for finding solution to reduce the expenses of software firm.

References

Amber, S. (2002). When and when aren't you Agile Modeling? Retrieved from http://www.agilemodeling.com/ essays/ (accessed on Sept 22, 2004)

Cockburn, A., & Highsmith, J. (2001). Agile Software Development: The people Factor. Retrieved from http://www.adaptivesd.com/Articles/IEEE Article 2 Final.pdf (accessed on October 25, 2015)

Martin, R. C. (2006). *Agile software development, principles, patterns, and practices*. Prentice Hall.

Mircea, M., & Andreescu, I. A. (2011). *Using cloud computing in higher education: A strategy to improve agility in the current financial crisis*. Academy of Economic Studies, Bucharest, Romania.

Schwaber, K., & Beedle, M. (2001). *Agile software development with SCRUM*, Prentice Hall.