Paper on an Approach for Cloud Adoption as Business Model

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Abstract:

C *loud computing now becomes as one of the most discussed topic among enterprise IT professionals. But it is still not a well understood term. Regular industry surveys show that market is moving towards adopting cloud as a business strategy but that needed, actual or the wise mean of cloud for a particular business is somewhere not clear. This is purpose of our paper to demonstrate what is the thinking lag between how people pursue cloud and what exactly the cloud is for your business. Forrester survey emphasize on operational maturity for success in adopting cloud as a business model. In this paper we try to propose path for cloud adoption in light of service oriented architecture as a five step procedure and conclude that adopting cloud computing as business model is particular for each organization, we must first access our maturity for adoption, prepare business case for objective and move accordingly.*

Keywords: Cloud Computing, maturity, service oriented architecture, business model

I.   INTRODUCTION

Although cloud computing is widely defined, in business terms, cloud is essentially a flexible, scalable, pay-per-use model for the way IT business applications delivered in the form of services are developed and consumed, typically through short-term contracts in the form of services. With its pay-as-you go model, cloud moves many IT business costs from capital expenditure to operating expenditure focusing on core business terms rather than infrastructure; its "elastic model" means available IT capability can be flexed to mirror changing business demand up or down; and it enables consumers of IT to have much greater transparency over their costs. Standard definition by The National Institute of Standards and Technology (NIST), Information Technology Laboratory [1], says:

Cloud computing is a pay-per-use model for enabling available, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

This cloud model promotes availability and comprises five key characteristics*:*

1. On-demand self service- The ability for an end user to sign up and receive services without any human interaction with the service provider.
2. Ubiquitous network access- Ability to access the service via standard platforms.
3.   Location independent resource pooling- Resources are pooled across multiple customers through physical and virtual servers for which customer has no knowledge of exact location and control.
4. Rapid elasticity- capabilities can scale up and down to cope up with crest and trough of demand curve.
5. Pay per use- Capabilities are metered and charged as per use.

Cloud Deployment Models

Deployment model states how the strategy impacts by defining the coverage boundaries.

1. Private Cloud - These are used exclusively for single organization and typically controlled, managed and hosted in private data centres. It is comparable to buying, building and managing your own infrastructure.
2. Public Cloud - These are the cloud infrastructure is owned by an organization selling cloud services to the general public or to a large customer group.
3.   Community Cloud - These types of infrastructure are used by group of related organizations that have same policy and compliance consideration for using common cloud environment
4.   Hybrid Cloud - These cloud infrastructures are composition of two or more clouds (internal, community, or public) that remain unique entities but are bound together by standardized technology that enables data and application portability mostly for cloud bursting scenario.

Cloud providers deliver computing resources as a service. It is not computing as a product that is owned but to computing as service that is delivered to consumers over internet from large data centres (clouds) in measured manner. Although companies define three major service model but it can be following:

*   Infrastructure-as-a-service-It is more like data centre-as-a-service. Not just one interface it is access to the entire machine, to all applications that are running on it.
*   Platform-as-a-service-It refers to hosting complete application development environment (including interface development, database development, testing etc.) to subscribers.

- Software/application-as-a-service-It refers to hosting application software over internet.
- Storage-as-a-service- Disk space that is physically at remote site but logically local to the application that need it.
- Database-as-a-service-On demand access to database that is created, maintained, updated at remote server but logically local to the application.
- Testing-as-a-service-It refers to remotely hosting testing softwares that has ability to test local and cloud delivered services typically not require particular setup.
- Governance-as-a-service-It refers any on-demand service that has ability to manage one or more cloud services by enforcing defined policies, change management, control management etc.
- Security-as-a-service-It refers to the ability to deliver security services remotely over internet. User identity management, data protection, privacy measures come under it.
- Process-as-a-service-It refers to binding several remotely hosted resources homogeneous or heterogeneous in nature together to form configuration for a solution.
- Information-as-a-service-It refers to consuming any type of remote hosted information present on Internet through well defined programmed APIs.
- Integration-as-a-service-It hosts applications that are needed to integrate on-premise systems and cloud systems including interfacing, process chain, design and so on[2].
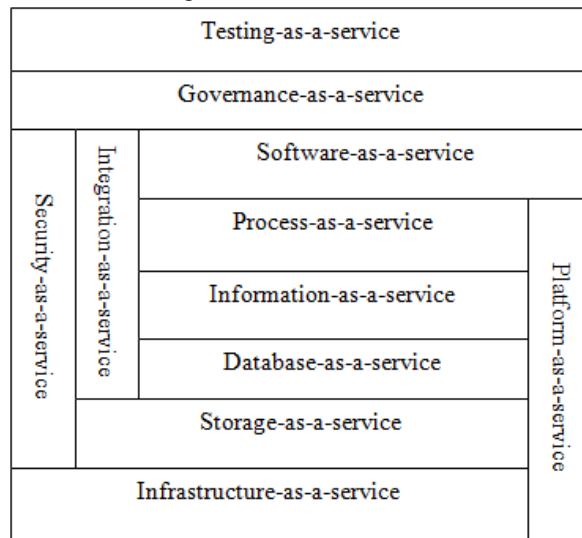

Figure1. Service model for cloud.

Now it is more clear that cloud is a strategy, a concept to implement business but every concept need some direction, an architecture to follow and this is what which is required. It means we have formula but we need to apply it in algorithm. A formula is never itself solution but it needs to be applied on problem in specific manner according to the problem. And that is service oriented architecture.

According to Forrsights survey of enterprises IT leaders, 33% of enterprises are putting high or critical priority on investing in cloud computing in 2012, analysis with clients show that 8% to 12% of enterprises are actually prepared, operationally, to manage and execute cloud as a business model[3].
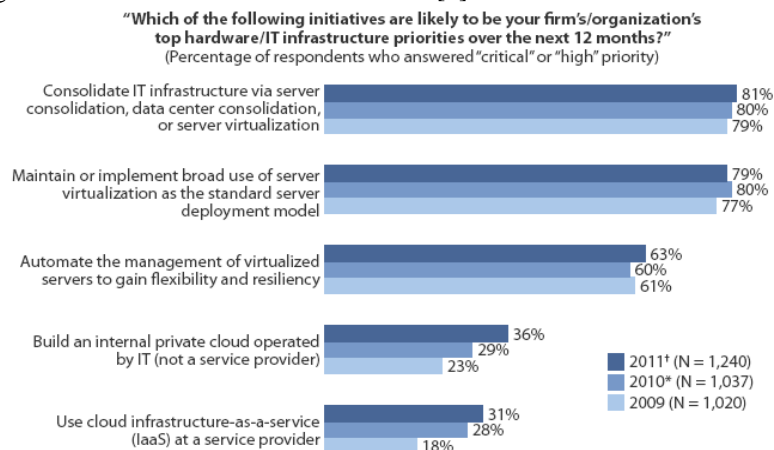
Forrester conclude that to adopt Cloud Computing as Business Model in stable and secure fashion successfully organization need operational maturity, it's familiarity with cloud computing technologies and services, level of experience with them and organization's degree of understanding what makes them different. These factors are key characteristics that differ with each stage of cloud service use and determine the degree of efficiency to which organization can leverage on them [3].

II. METHODOLOGY

SERVICE ORIENTED ARCHITECTURE

Service oriented architecture(SOA) is a systematic framework of technology that enable all users, end users or developers to access well defined services, and information bound to those services, that may be further wrapped into process layers and composite applications for solution development. SOA brings agility to the architecture that allows to deal with run time changes through configuration layer rather than to constantly redevelop it every time.

Cloud computing and service-oriented-architecture complement each other in taking benefit of business concept pay-per-use done through network with architectural discipline. A combination of these two (cloud computing using SOA) provide agility benefit that in turn make cloud adoption more successful [4].

In order to understand cloud computing using SOA we list steps as flowchart of activities that need to be performed. These may be as:

1. Access Maturity
2. Understand Requirements
3. Make Business Case for Cloud
4. Stepwise Procedure
   4.1 Work on Data to Cloud
   4.2 Work on Services to Cloud
   4.3 Work on Processes to Cloud
5. Final Architectural View

1. Access Maturity

The business is pushing for new and innovative ways to increase top investment and pushing to take cloud computing at maximum extent. We are asked to get maximum return on investment from available resources using IT for competitive advantage but for that we first need to check how much we are ready to take new technology, changes that will come as a result of adoption; we need to access our maturity. Cloud adoption maturity ranges from beginners to focus with mid levels in between. According to our stage in adoption level, actions, tasks and actual work is planned and done in that way. Cloud is not a solution for everything we need to identify strategic right sourcing methodology according to our maturity and needs [5].

2. Understand Requirements

Undertake a detailed assessment of the core requirements, the issues that need to be addressed, as well as end user priorities, and translate them into an appropriate cloud strategy. The absence of such an assessment may result in an inappropriate choice of solution that may not meet end user expectations or business needs.

3. Prepare Business Case for Cloud

This is very important step of the complete journey. It refers to factual analysis of what actually your business is, what are its current values, what you expect what should be after adopting cloud in terms of hard and soft benefits. It is basically financial estimate in terms of money values before and after the changes scenarios[6].

It may be termed as

1. Understand present status
2. Assign costs
3. Model "existing"
4. Model "expected"
5. Define value point
6. List defined Benefits
7. Define indirect Benefits
8. Create final Business Case

Understanding present issues refers addressing specific goals of your particular business in your concern, means each business have its own promises to its customers, its own profits definitions, principles that make core business values. These vary with business type.

We need to set cost for these issues in terms of money based on gathered data and analysis. These costs are then verified against new costs after change.

We prepare a logical architecture for existing system including all relevant systems, data, services, processes and other details

Then we prepare an "expected" model that depicts what we expect to see changes by cloud using SOA solution for the business with possible effects.

We need to set values for each and every objective that we want to achieve by cloud.

We need to list direct and visible cost benefits called defined benefits also those which are difficult to quantify but contribute for business success called indirect benefits.

On following this procedure formally create the final proposal called business case of your enterprise for cloud.

4. SOA Stepwise Procedure

After creating business case for cloud adoption we get clear with our agenda that "this is what we have to achieve" with clear facts, reasons and our objective well defined. Now working phase get start which consists of development process and high level governance on it. In simple, this phase comprises of technological implementation details that are abstracted by configuration layer. We can elaborate this procedure as working on three things- on data, services, and processes.
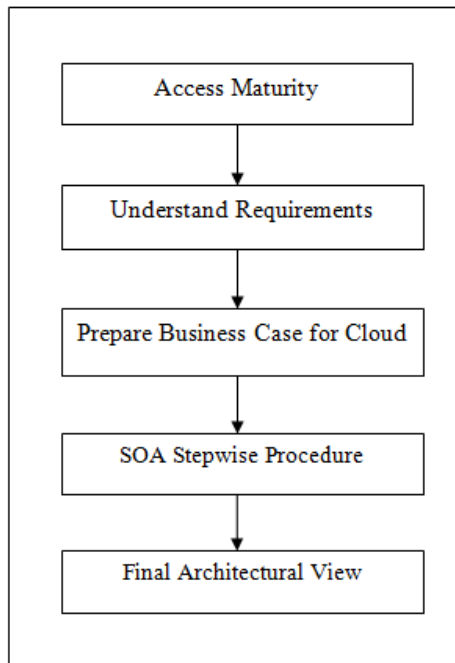

Figure3. Flowchart for cloud using SOA approach

4.1 Work on Data to Cloud

Working on data refers to defining all relevant metadata within the candidate application, for both when creating cloud system from scratch or when transforming an on-premise system to cloud based. Metadata is data about data. It means defining where data is now, the data structure, logical model, physical model, data dependencies, integrity, and security issues etc. outcome of this procedure is a populated metadata layer and a common information model which serves as a global repository for all data related potential solutions [2].

This information model is used to manage data between on-premise and cloud application to make sure that they function as if they exist within the same data centre without any issue.

4.2 Work on Services to Cloud

Working on services for cloud refers to identifying and listing web, remote services, APIs, transactions- functionalities that are hosted by candidate system purpose is to arrange them in such a way that these can be used in heterogeneous environment to deal with any kind of composite applications, all coupled together using modules.

For a programmer services refers as subroutines or procedures or functions of a programming language.

4.3 Work on Processes to Cloud

After understanding information model, service directory for the business we need to define a higher level mechanism for interaction, including all high-level, mid-level and low-level processes. Process defines how we use services to form business solution. This is done through configuration. Outcome of this phase is a configuration model that depicts logical configuration as processes that refer back to services which then back to information.

5. Final Architectural view

Product of previous phase the process model is more justified for one module or domain of the entire business, after doing each transition or implementation from new; see that new change, that migration done with innovation in contrast to the whole canvas of your business architecture. It means each step that you move to take cloud benefits for your enterprise; it is advised to look at that from business architect point of view, mostly done by business core team.
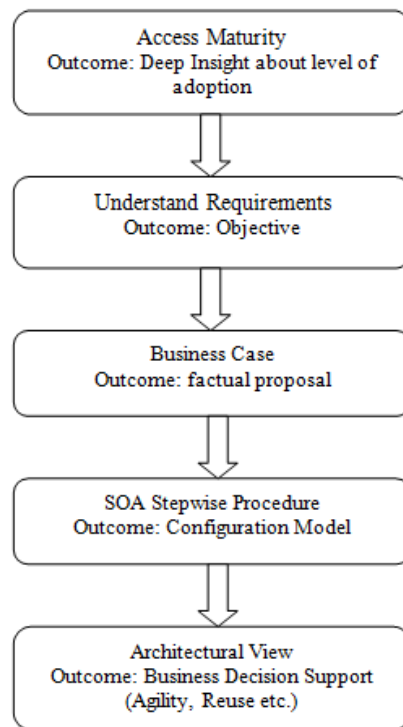
Figure4. Detailed Approach for Cloud Adoption as Business Model

III.   CONCLUSION

By procedural approach we proposed we conclude that it is true, that cloud is not for all kind of business issues also not all issues cloud is the solution but where cloud is applicable we should follow strategy for more chances of successful deployment rather than doing just the last step. In proposed methodology further steps can be testing, governance, security measures, deployment etc. we propose form planning to finalise the architecture. It covers understand cloud for your particular business. Cloud is a business strategy used according to requirement not a product purchased. Cloud is more like a unique pattern according to business needs and power in terms of business level, resources, organization environment and technical aspect, that's the idea we try to convey. More successful deployments will promote market to take advantage of this powerful concept and reach new hills if Information Technology.

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