

# Chapter 45

## Modelling of Cloud Computing Enablers Using MICMAC Analysis and TISM

**Nitin Chawla**

*Amity University, India*

**Deepak Kumar**

*Amity University, India*

### ABSTRACT

*This article describes how Cloud Computing is not just a buzzword but a shift from IT departments to the outsourcing vendors without impacting business efficiency. Some organizations are moving towards cloud computing but many have resistance to adopting cloud computing due to limitations in knowledge and awareness of the classifying elements, which effect decisions on the acceptance of cloud computing. Therefore, this article has focused on accumulating the elements, which can act as enablers, by reviewing existing literature and studies from both professional and academic viewpoints. All the identified enablers have been structurally modeled to develop the relationship matrix and establish the driving power and dependence power of every element. This is done by employing Total Interpretive Structural Modeling (TISM) and Cross Impact Matrix Multiplication Applied to Classification (MICMAC) analysis.*

### INTRODUCTION

In this business world, organizations have become competitive and global. The aim of most of the organizations is long-standing endurance and it depends upon organization's ability to enable its business processes and needs by implementing applications with the help of IT at moderate upfront investment and minimum maintenance cost. Now is the time to initiate the deliberation about IT infrastructure and IT application which need to be more dynamic to address the significant infrastructure challenges. Organizations must start cognizant thinking to build or improve IT infrastructure to support flexible and on demand business needs. Flexibility and Agility are the key to tackle the business requirements which are continuously changing or increasing. Cloud computing has given the option to use IT resources

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either infrastructure or application or both on private cloud or public cloud. From business perspective, self service offerings on SaaS model with pay-as-you-go pricing options are available. Services can be provisioned in very less time with the flexibility to scale up or down along with the prices. From IT perspective, lesser involvement of IT resources in infrastructure management and better service delivery with the improved SLAs are driving factors. Virtualization of IT infrastructure has become the backbone of cloud computing by fulfilling the need of shared usage of large pool of resources.

Internet of Things enabled billions of devices using cloud computing and Smart home is one of the solution where cloud along with IOT is moving along hand in hand. A research provides details of contributions in facilitating the readiness of the concept “Internet of Things” in Smart Homes. In this paper, we have studied roles of cloud computing in supporting Smart Home, scope and components of Smarter Homes’ technologies required for Smarter Homes (Sharma, Chawla, & Kumar, 2015).

Internet of Things is getting famous and matured day by day. There might be millions of IOT devices connecting to the Internet via Cloud Computing. Security and QoS shall play a big role while using IOT devices to run the IOT Solutions in smoother way. Mathematical Modelling shows the parameters to be considered for QoS without affecting the performance and security of the solution. The study also proposes the mathematical model for QoS parameters like reliability, communication complexities, latency and aggregation of data for IoT (Mahamure, Railkar, & Mahalle, 2017).

Organizations face difficulties in dealing with complex issues because of availability of ample impacted attributes or criterion and their relationships among each other. The existence of inter relationship between attributes complicates the articulation in an understandable manner. Thus, development of ISM methodology (Sage, 1977), which facilitates in recognizing a structure within a system, took place.

Usage of IT applications and infrastructure is going to increase so that business can run smoothly and that with the right way to manage its data and processes. Advances in Information and Technology has lead the need of cloud computing. Cloud computing is computing paradigm which offers infrastructure or platform or software as a service. Cloud computing backbone is the architecture of need based resource distribution while leveraging multiple technologies such as Virtual Machines. Cloud computing also offers services such as levels of service management, lower downtime and higher uptime window. Cloud computing provides services based on the needs of the organizations for example increased CPUs for faster processing, dedicating RAM to support high transaction volume (Buyyaa, Yeo, Venugopal, Broberg, & Brandic, 2009).

Cloud computing has brought multiple improvements in data center like low utilization of equipment, high energy consumption. A study shows how to establish distributed traffic cloud data center based on SOA (Service-Oriented Architecture) fused with cloud computing along with the application of DENS (Data- center Energy-efficient Network-aware Scheduling) algorithm to realize the full utilization of resources in Cloud Data Center (Zhang, Qi, & Deng, 2017).

Adoption of new technology or concept is always a challenge that’s why there are still some reservations to adopt cloud computing. Various strategies and factors have been identified which helps the organizations in adoption of cloud computing. Factors not only cover the technical aspects but also cover other functional and cost related aspects to identify the right Cloud computing environment. Some of the factors are Capital Expenditure required to use an application or infrastructure, lead time to enable the application or its related infrastructure, security related aspects or factors, availability of the application or infrastructure (Nitin & Kumar, 2015).

This paper is divided into multiple sections as follows: Section 2 highlights the review of some of the existing literature to identify the elements that might affect the adoption of cloud computing. Section 3

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