

Evaluating Cloud Technology Solutions for Business Development and Business Strategies

Nagoori Julfathna*, Dr.G.Anjan Babu**, M.Jayakameswaraiah***

* Ph.D Research Scholar, Department of Computer Science, Sri Venkateswara University, Tirupati, Andhrapradesh, India

** Associate Professor, Department of Computer Science, Sri Venkateswara University, Tirupati, Andhrapradesh, India

*** Ph.D Research Scholar, Department of Computer Science, Sri Venkateswara University, Tirupati, Andhrapradesh, India

Abstract- The presence of cloud computing as a tool in business is getting a reaction almost as though it's something new. There's a lot of attention being paid to advances mostly as a result of affordable, scalable SaaS solutions. These solutions allow for a mobility and ease of access for which older systems didn't allow. Given that they're a symptom of the newer cloud computing push, they're of course serving to earn accolades for the cloud that it did not have previously. Cloud computing offers your business many benefits. It allows you to set up what is essentially a virtual office to give you the flexibility of connecting to your business anywhere, any time. With the growing number of web-enabled devices used in today's business environment (e.g. smart phones, tablets), access to your data is even easier. There are many benefits to moving your business to the cloud. Business can scale up or scale down your operation and storage needs quickly to suit your situation, allowing flexibility as your needs change. Rather than purchasing and installing expensive upgrades yourself, your cloud computer service provider can handle this for you. Using the cloud frees up your time so you can get on with running your business. Business applications are moving to the cloud. It's not just a fad—the shift from traditional software models to the Internet has steadily gained momentum over the last 10 years. Looking ahead, the next decade of cloud computing promises new ways to collaborate everywhere, through mobile devices. On the other hand, the best cloud solutions can be designed to help enterprises become the builder and broker of services, maintaining control, building value, and leveraging the power of private and public clouds. In conclusion, the paper emphasizes that, as most enterprises are creating a hybrid service portfolio comprising services from many sources, it is critical that business management must align the right model to the right service in order to build, consume, and manage appropriate cloud services in an effective and secure way.

Index Terms- Cloud Technology Developments, Cloud Computing Business Services, Cloud Solutions, Business benefits and Strategies

I. INTRODUCTION

In the last five years, enterprises have increasingly embraced cloud technology to help them innovate and transform their business. Cloud-based applications that automate sales processes, HR management, collaboration, email and file sharing are growing fast and enabling businesses to meet their needs in a shorter timeframe than ever before. Cloud technology has been described as an umbrella term to specify a range of sophisticated on demand computing services initially offered by commercial providers, such as Amazon, Google, and Microsoft. It denotes a model on which a computing infrastructure is viewed as a cloud, from which businesses and individuals access applications from anywhere in the world on demand. The main principle behind this model is offering computing, storage, and software as a service [1].

Cloud solutions offer a range of economic benefits to their users and to the economy as a whole. In particular, it has the potential to free businesses from having to spend more capital on IT. And it also enables businesses to be far more agile in their use of technology, no more waiting for many weeks to install new IT capacity when capacity can be scaled up through a self-service portal (Bakshi, 2009). At the same time, cloud security risks are occurring with increased frequency. Though the risks from malicious hacks to insider threats can seem rising, a holistic approach to cloud information and data protection can help companies reduce the risks of adopting the cloud (Browne, 2010; Karadsheh and Alhawari, 2011).

As an evolving paradigm, cloud technology can be adopted as a service model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Many researchers in the academic and business spheres have attempted to define exactly what cloud technology is and what www.theinternationaljournal.org > RJEBS: Volume: 01, Number: 12, October-2012 Page 8 unique characteristics it presents. Buyya, Broberg, and Goscinski have defined it as follows: "Cloud is a parallel and distributed computing system consisting of a collection of inter-connected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements (SLA) established through negotiation between the service provider and consumers [2]." Chee and Franklin have stated that "cloud computing is an information-processing model in which centrally administered computing capabilities are delivered as services, on an as-needed basis, across the network to a variety of user-facing devices [3]." Cloud technology can be adapted as a service-delivery model to instantiate new business flexibility and scalability. Beyond the potential economic benefits, perhaps the most important attribute of cloud computing services is that they enable completely new business and technology solutions with

enhanced business value. Certainly, there are numerous issues to be considered and perhaps addressed as the computing industry transitions to a new IT infrastructure.

II. EVALUATING CLOUD SERVICES, BUSINESS BENEFITS AND VALUE

There are several studies evaluating the economic impact of cloud computing based on economic models. The Centre for Economics and Business Research (Hogan, 2010) developed in 2010 an economic model to estimate the impact of widespread adoption of cloud computing on the five major economies of the EU (France, Germany, Italy, Spain, UK). According to this study, cloud computing (including public, private and hybrid) had the potential to generate over €763 billion of cumulative economic benefits over the period 2010 to 2015, corresponding to 1.57% of total cumulative GDP of the five economies over the same period. Cloud computing adoption was also expected to yield annual net new jobs of 446 thousand across the five economies by 2015.

In analyzing the economical benefits of cloud solutions, economist Federico Etro presents two possible scenarios (Etro, 2011): slow diffusion of the new technology leading to a 1% reduction of the fixed production costs, and rapid adoption leading to a 5% rapid reduction in the fixed costs. In the first scenario, cloud computing is expected to generate additional GDP growth in the main EU economies of approximately 0.1% a year; in the rapid adoption scenario, GDP growth could go up to 0.4% in the medium run (up to 5 years). According to Etro, the most relevant benefit of cloud adoption is the generalized reduction of the fixed costs of entry and production, in terms of shifting fixed capital expenditure (CAPEX) in ICT into operative costs (OPEX) depending on the size of demand and production. This contributes to reduce the barriers to entry, especially for the SMEs, with a strong potential impact on the creation of new enterprises, new jobs, and the exploitation of new business opportunities. Therefore, this mechanism could lead to the permanent creation of up to 400,000 new SMEs in Europe. In the phase of introduction of cloud computing, the creation of new jobs could vary between 300,000 jobs in the slow adoption scenario and 1 million jobs in the rapid adoption scenario.

Cloud solutions offer customers a range of business benefits beyond cost savings. As a recent IDC survey has found (Bradshaw and others, 2012), the business benefit most widely seen or expected is an increased effectiveness of mobile working. Generally, cloud applications can be accessed from anywhere with an Internet connection and increasingly this means via a mobile device; in fact mobile access is increasingly a standard feature of cloud applications but much less so for the installed base of conventional on-premise applications. Productivity also increased due to the user interfaces on cloud services often being easier to use than the software they are replacing. It can be seen that the seller return shipping insurance significantly increases consumer propensity to buy regardless of their regulatory focus (see Fig. 1).

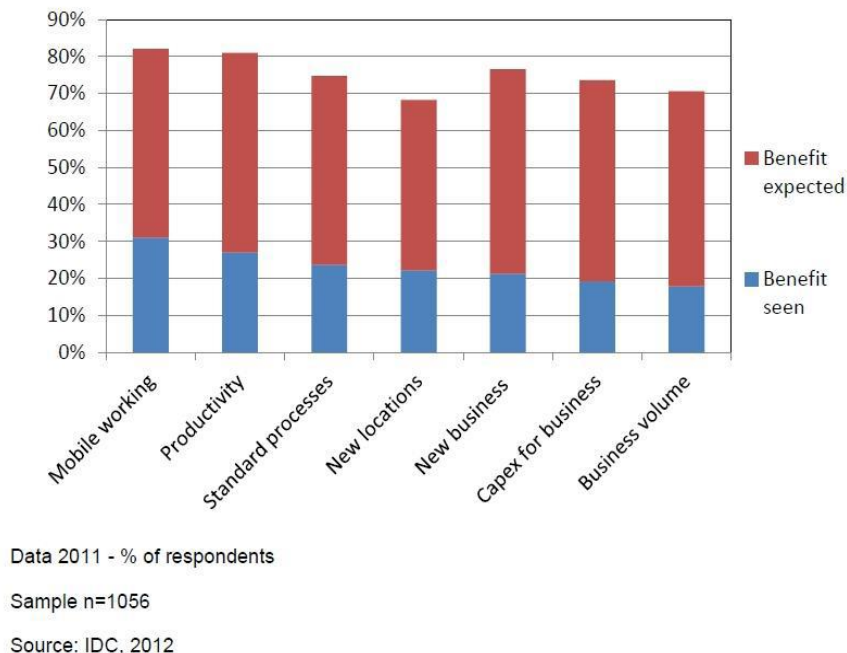


Fig. 1: Business Benefits Seen and Expected

Other cloud benefits impact business organization and market approach (Zhang, 2012). "Standard processes" means that, through using a common cloud service, the different parts of the business are better able to ensure that core processes are executed in a standard way. "New locations" means that the cloud makes it easier to open up offices in new areas, and "new business" means that cloud has enabled the opening up of new business lines, through making it possible to "turn on" the required services rather than having to go through extended provisioning and implementation processes. "Capex for business" means that it was possible to switch

capital expenditure from IT to the business – a corollary to cost savings. "Business volume" means that organizations were able to increase revenues.

III. CLOUD SOLUTIONS AND BUSINESS STRATEGIES

At the foundation of cloud solutions and applications is the broader concept of infrastructure convergence and shared platforms (see Fig. 2).

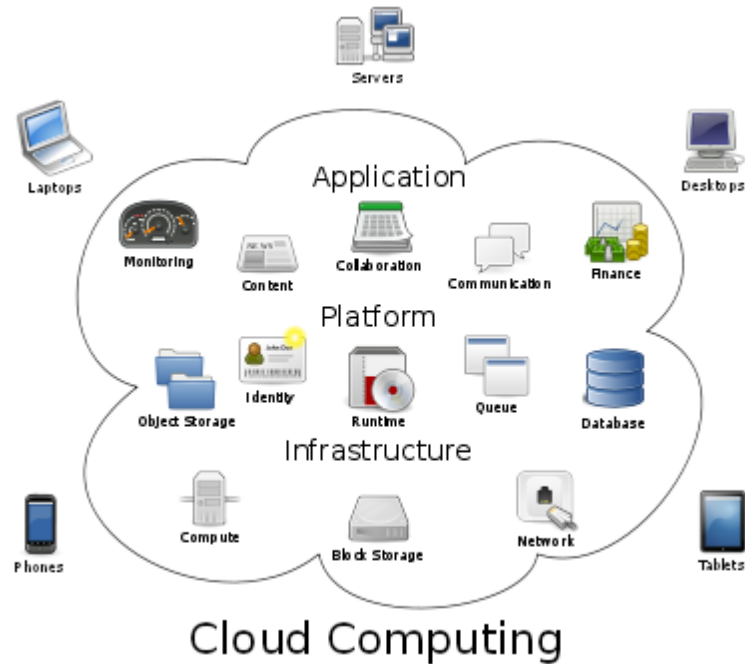


Fig. 2 Cloud Computing Environment

This type of data exchange and networking environment allows enterprises to get their applications up and running faster, with easier manageability and less maintenance, and enables an enterprise to more rapidly adjust IT resources to meet fluctuating and unpredictable business demand.

Cloud computing is a new model of consuming and delivering IT and business services. It enables users to get what they need, as they need it, from advanced analytics and business applications to IT infrastructure and platform services, including virtual servers and storage. It can provide significant economies of scale and greater business agility, while accelerating the pace of innovation [4].

Many business leaders have posed the question of whether the business adoption of cloud technology is just a new form of outsourcing. In fact, cloud solutions, in terms of their sourcing, management, and risk/opportunity profiles, more closely resemble managed services. Broadly, a managed service is the practice of transferring day-to-day management responsibility as a strategic method for improved effective and efficient operations including production support and life-cycle management activities. Managed services and outsourcing are conceptually similar; however, the difference is in how they are structured and the degree to which they are customized. IT outsourcing has become a metaphor for a complex and highly structured transfer of operational and management processes to a third-party provider [5]. A managed service is the selection of a standard offering to source out a specific set of responsibilities or activities. In this way, managed/hosted services attempted to drive better costs through standardization, in contrast to the traditionally one-off structure of outsourcing deals. In this regard, public cloud services are a next logical step from hosted services, in the standardization of cloud services.

Cloud computing and solutions, in their many forms and flavors, will continue to evolve rapidly and assume increasingly critical roles within organizations as these technology platforms mature. Further, it is important to note that most organizations will use a combination of public, private, and hybrid cloud services. The hybrid cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability. Many enterprises and organizations have used managed services successfully; conversely, outsourcing remains a somewhat loaded term within the computing industry as many organizations have had somewhat mixed results with the strategy. At the risk of oversimplifying, the more standardized nature of managed services and solutions is a major part of their success. Building once and delivering many is a much more efficient process for a service provider than building once and delivering once. As business executives and IT leaders approach a potential public cloud services contract, leveraging the

organization's experience and best practices with managed services contracts such as standardization, service-level definition, and contract management would enhance outcomes [6].

The availability of public cloud services sourcing, provisioning, and delivery options creates critical new enterprise questions and opportunities for business and technology architecture. When selecting external public cloud service options, it is not just about technology architecture, but the implications for other aspects of the computing infrastructure. At issue is how the technology infrastructure and business processes interact to shape operations, service delivery, and employee enablement. As the industry is still in the early phases of public IT cloud services evolution, the architectural implications are still evolving. Virtually all IT leaders and business executives within buyer organizations have been exposed to the term “cloud computing”, but as industry best practices, nomenclature and industry offerings continue to evolve rapidly, internal discussions, strategy formulation, and sourcing evaluations can often be confusing and frustrating. Because lower cost is often cited as a chief advantage of cloud computing, business executives often seek to embrace new options without a fully reasoned discussion of options [7].

Securing information within a cloud computing environment requires three levels of security: network security, host security, and application security. These security needs are also present within in house infrastructure, and are impacted directly by access policies and workflows of an entity which owns and manages its resources. When an entity moves to cloud computing there are security challenges at each of the three levels, as well as those dealing with the operation of the business and the individuals involved in the system's deployment and management. Although these security challenges are exacerbated by cloud computing, they are not specifically caused by it [8].

International legal issues also need attention. When data are moved into the cloud, providers may choose to locate them anywhere on the planet. The physical location of data centres determines the set of laws that can be applied to the management of data. For example, specific cryptography techniques could not be used because they are not allowed in some countries. Similarly, country laws can impose that sensitive data, such as patient health records, are to be stored within national borders.

IV. CHANGING INFRASTRUCTURE MANAGEMENT FOR BUSINESS INNOVATION

Many of today's IT systems for business and e-commerce purposes were created before social and mobile took over the world. Legacy technologies require complex software stacks and frequent upgrades, along with ongoing hardware maintenance. Many IT departments realize that they don't want to be in infrastructure maintenance mode (Buyya and others, 2010). They are moving to the cloud so they can focus on solving business issues, not infrastructure ones. Cloud platforms instantly deliver services that can take weeks to build out on legacy systems. Developers never have to install servers, data centers, databases, or software stacks. Instead, they move straight to the business logic and user experiences that differentiate brands and innovate for customers (see Fig. 3).

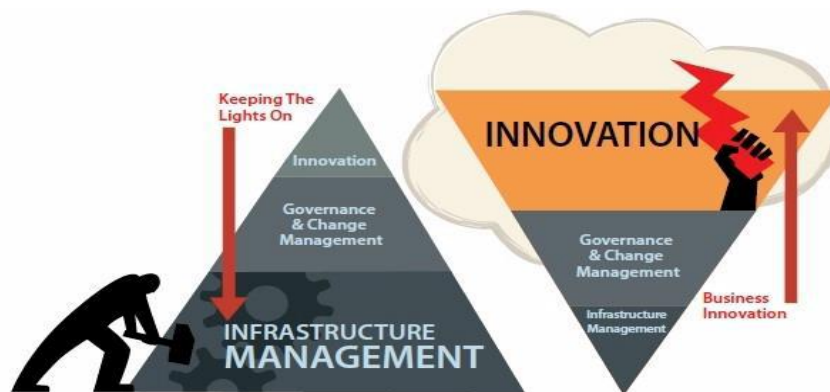
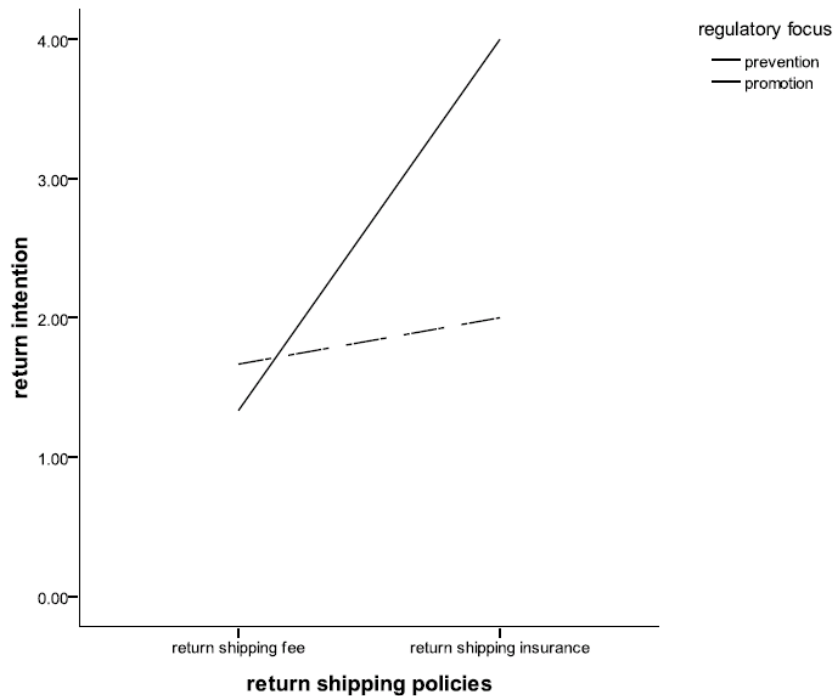


Fig. 3: Cloud Solutions for Business Innovation

Many business professionals focus on cost savings to evaluate the success of their cloud-based collaboration initiatives. Indeed, the cloud can reduce costs, dramatically. But this is not the only core driver behind most organizations' push for business promotion and development. Instead, strategic objectives tend to include greater innovation, organizational dexterity, customer satisfaction, employee engagement or related intangibles (Sasikala, 2011).



Cloud applications can be deployed moments after purchase, giving users quick access to innovation as it is developed. The delivery model provides near-infinite capacity for scaling up or down based on changing requirements, so businesses pay for what they use, and utilization can be matched with real business requirements. For IT managers, access to cloud applications and platforms means that they can match their onsite datacenter resources with components that are cloud sourced to provide a more complete technology portfolio for their users. Most importantly, the cloud means IT organizations have a powerful new asset to help them keep promises to their most important customer — their business units.

As companies don't want to make large investments in technologies that go unused, the best way forward is to go around educating the business professionals on the functionality and value of cloud solutions and then get buy-in. In this way, the enterprise gets the greatest return on investments, and the business appreciates the value in cloud services. To take a more effective approach to business innovation, enterprises can go at the pace as needed to develop new strategies for adopting cloud solutions to handle the process of changing infrastructure management.

V. ASSESSING CLOUD SECURITY RISKS

One of the critical issues in evaluating cloud solutions is data security. Cloud-based services today can be compared to Internet banking. Consumers were initially afraid that online banking would make them more vulnerable to fraud or identity theft. Now that online security technologies have improved, online banking is actually safer than getting paper statements in the mail. Likewise, using a cloud-based service supplier instead of operating one's own internal system can be a major step toward becoming liberated from serious security risk issues (Browne, 2010; Karadsheh and Alhawari, 2011).

It is important to understand the four key components of data security: availability, integrity, confidentiality, and traceability. Data availability ensures continuous access to data even in the event of a natural or man-made disaster or events such as fires or power outages. Data integrity ensures that the data is maintained in its original state and has not been intentionally or accidentally altered. Data confidentiality means information is available or disclosed only to authorized individuals, entities, or IT processes. And data traceability means that the data, transactions, communications, or documents are genuine and that both parties involved are who they claim to be (Bonneau and Prebusch, 2010).

It is cost prohibitive for many individual business systems to support the investment in the equipment, technology, personnel, and ongoing training required to deliver the highest level of data security. Converting to best-in-class cloud-based services allows enterprises to achieve industry-leading data security, including data availability, integrity confidentiality and traceability. This security is delivered through the physical infrastructure of the data center, the hosted application that manages data, and the policies and procedures that govern data access, audit trails, remote monitoring, incident management, and business continuity. As the standards for data security rise, it is time to evaluate cloud-based services from a world-class provider. Selecting the best cloud-based services provider for business development needs allows this technology to prevent the enterprise from security problems.

VI. CONCLUSION

The world is changing. A new reality is emerging for enterprises and organizations of every size from every part of the planet. It's called the cloud, a profound evolution of the computing industry with revolutionary implications for business and society, creating new possibilities and enabling more efficient, flexible and collaborative computing models. Technology adopting processes are often time consuming and often involve multiple organizational constituencies with various agendas. Business executives remain acutely focused on cloud projects that create business differentiation, accelerate time to market, or enable new capabilities with potential business impact. Business leaders are often focused on platforms, sourcing options, or delivery models that fuel capability as well as improve cost efficiency.

A cloud-based approach to business helps enterprises accelerate business results, improve business processes and stimulate innovation. Additional benefits include, but are by no means limited to, breaking down barriers between time zones and functions and enhancing mobile workforce productivity. As for the next frontier, business professionals are looking outside their organizations to focus on improving collaboration with external groups such as customers, suppliers and partners. And all such actions, enterprises are leading to significant gains in competitive advantage.

What is particularly striking is the more cloud solutions in evidence, the higher the marks conferred in terms of achieving value through innovative business strategies. Greater familiarity and more department head involvement, in essence, leads to higher confidence that collaborative strategies create value and that cloud solutions are helping get it done. Optimized business integration with risk management strategies quite simply leads to better performance. And as this paper shows, the cloud is by far the most effective means of leveraging business innovation and development. Consequently, now is the time for more business professionals to follow the trends to evaluate and implement value-added cloud solutions.

REFERENCES

- [1] and P. Mell, and T. Grance, "The NIST Definition of Cloud Computing. National Institute of Standards and Technology, Information Technology Laboratory", 2009.
- [2] R. Buyya, J. Broberg, and A. Goscinski, "Cloud Computing: Principles and Paradigms", Hoboken: John Wiley & Sons' 2010.
- [3] B. Chee, and C. Franklin, "Cloud Computing: Technologies and Strategies of the Ubiquitous Data Center", Hoboken: CRC Press, 2010.
- [4] P. Sasikala, "Cloud computing towards technological convergence", International Journal of Cloud Applications and Computing, vol. 1, no. 4, 2011, pp. 44-59.
- [5] W. Voorsluys, J. Broberg, S. Venugopal, and R. Buyya, "Cost of virtual machine live migration in clouds: a performance evaluation", in Proceedings 1st International Conference on Cloud Computing, Beijing, 2009, pp. 254-265.
- [6] N. Yigitbasi, A. Iosup, S. Ostermann, and D. Epema, "C-meter: a framework for performance analysis of computing clouds", in Proceedings of CCGRID'09, 2009, pp. 472-477.
- [7] B. Furht, and A. Escalante, "Handbook of Cloud Computing", Dordrecht: Springer, 2010.
- [8] L. Karadsheh, and S. Alhawari, "Applying security policies in small business utilizing cloud computing technologies", International Journal of Cloud Applications and Computing, vol. 1, no. 1, 2011, pp. 29-40.
- [9] Sasikala, P., "Cloud computing towards technological convergence", International Journal of Cloud Applications and Computing, Vol. 1, No. 4, 2011, pp. 44-59.
- [10] Barbour, T., "Cloud computing: a growing information technology alternative", Alaska Business Monthly, Vol. 27, No. 6, 2011, pp. 36-39.
- [11] Eto, F., "The economics of cloud computing", The IUP Journal of Managerial Economics, Vol. 9, No. 2, 2011, pp. 1-6.
- [12] Zhang, L., "Cloud technology and business strategies", Research Journal of Economics Business Studies, Vol. 1, No. 12, 2011, pp. 7-14.

BIOGRAPHY

Nagoori Julfathna -- Received her Master of Computer Science Degree from Bangalore University, Karnataka, INDIA in 2009 and Currently Pursuing Ph.D in Computer Science from Sri Venkateswara University, Tirupati, Andhrapradesh, INDIA. The Research fields of interest are Cloud Computing, Software Engineering and Data Mining, etc. E-Mail: julfathnafayaz@gmail.com.

Dr.G.Anjan Babu -- Received his Ph.D from Department of Computer Science from Sri Venkateswara University, Tirupati, Andhrapradesh, INDIA. He is Currently Working as Associate Professor in the department of Computer Science, Sri Venkateswara University, Tirupati, INDIA. He has more than 8 years experience in teaching field. The Research fields of interests are Cloud Computing, Data Mining, Cryptography and Network Security, etc. E-Mail: gababu.apps@gmail.com.

M.Jayakameswaraiah -- Received his Master of Computer Applications Degree from Sri Venkateswara University, Tirupati, Andhrapradesh, INDIA in 2009 and Currently Pursuing Ph.D in Computer Science from Sri Venkateswara University, Tirupati, Andhrapradesh, INDIA. The Research fields of interest are Spatial Data Mining, Cloud Computing, Software Engineering and Data Base Management System. E-Mail: mjayakameswaraiah@gmail.com.