

Chapter 108

Emerging Cloud Computing Services: A Brief Opinion Article

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ABSTRACT

Cloud Computing has offered many services to organizations and individuals. The emerging types of services such as analytics, mobile services and emerging software as a service have been offered but there is a lack of analysis on the current status. Core technologies for emerging Cloud services have been identified and presented. This brief opinion paper provides an overview of the current emerging Cloud services and explains the benefits for several disciplines. Four areas have been identified that may bring in more positive impacts for the future direction.

1. INTRODUCTION

Cloud Computing has moved in different directions due to the maturity of different technologies, easier access to data, improvement in quality of service, availability, usability and security (Buyya et al., 2009; Armbrust et al., 2010; Marston et al., 2011). However, there are different recommendations in which directions that Cloud Computing should move forward. Mobile Cloud is popular due to the rise and availability of mobile services with affordable costs (Fernando et al., 2013; Chang, 2014 a). A lot of services can be delivered online and on mobile internet so that people can receive, share and store almost information quickly and instantly. Similarly, there are different types of services such as weather forecasting and simulation which can make the public to be more aware of the extreme weather conditions, so that they can make better preparations for challenges ahead. There is a Business Intelligence as a Service which can monitor the status of return and risk in real-time and predict the market trends, so that the stakeholders can make better judgment on their investment (Chang, 2014 b; Ramachandran and Chang, 2014). Gaming as a Service (Yao and Chang, 2014; 2015) provides interactive gaming services for millions of users who can play online. The trust and friendship they have developed can be essential

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for community building and business opportunities. Disaster Recovery and Storage as a Service (Chang, 2015 a) can ensure all big data can be protected and services to be resumed in a short of time when major accidents have happen. The benefits of doing so can allow business continuity with a minimum impacts to disruptions. There are also security concerns and improvements to ensure that all services and users are safeguarded from real attacks. There are services to blend with firewall, access control, identity management, encryption and Openstack to allow data is always protected from unauthorized access (Chang et al, 2016 a; Chang and Ramanchandran 2016). All these examples lead to the development of Emerging Software as a Service and Analytics (ESaaS), which aim to understand the complexity behind each discipline, run simulations at the background and present the results in a way that can be understood more easily by the general public without even the background knowledge. This serves the future trends in the Emerging Cloud Computing Services, whereby Chang (2016 a) demonstrates several examples in different disciplines and explains the contributions for each discipline under his proposed “Emerging Software as a Service and Analytics” (ESaaS).

2. CORE TECHNOLOGIES

This section explains the core technologies used by Emerging Cloud Computing Services essential for the service development, maintenance and expansion. Core technologies are as follows.

- **Database and Data Warehouse:** All the collected datasets should provide storage, query and archiving services and allow users to understand, query and synthesize datasets (Di Meglio et al., 2014).
- **Artificial Intelligence and Machine Learning:** Artificial intelligence and machine learning can compute all the mathematical models and complexity behind the scenes and ensure all results can be modeled quantitatively (Chen et al., 2014).
- **System and Software Architectures:** Modern system and software architectures should be developed to ensure all services can be efficiently functioned (Zhang et al., 2010), such as the use of API for architecture development (Chang, 2014 b).
- **Statistical Computing and Analysis:** They provide useful analysis for computational and social scientists such as the use of Organizational Sustainability Modeling (OSM) to provide useful real cases (Chang et al., 2016 b)
- **Visualization and Analytics:** Visualization and analytics can ensure users can understand scientific outputs better and easier, particularly from numerical computing to visualization and analytics (Antcheva et al., 2009; LaValle et al., 2013).
- **Predictive Modeling and Analysis:** Results of the previous data can be used to predict the likely trends and study the similar patterns and behaviors between different datasets, correlations and variables (Cohen et al., 2013).
- **Big Data Services:** Big Data services including volume, velocity, variety, veracity and value should be provided with real deployment and case studies (Chang and Wills, 2016).
- **Security:** All services must be secure and protected from hacking and unauthorized access. Large scale data analysis should be provided to know the latest trends (Chang et al., 2016 a; 2016 c).
- **Other Areas:** Other areas include the integration with the latest technologies such as Big Data and Internet of Things, whereby more users can interact with other individuals and businesses within an interactive platform.

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