Chapter 20
Cloud Computing:
Technology Adoption and Challenges in Developing Countries

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ABSTRACT

The chapter aimed at describing cloud computing technology and its components and how developing countries find opportunities of future growth through the adoption of cloud computing in the areas of e-governance, e-business/commerce, e-health or e-education. Chapter details the benefits of cloud computing due to its nature of reduced cost, pay-as-you-go, elastic, scalable, higher availability and managed offerings. The chapter also outline challenges in Cloud Computing infrastructure implementation in the developing countries, even though there is a huge demand for cloud based solutions. The chapters has references to multiple case studies, trends and articles to showcase how developing countries are moving fast in the adoption of cloud computing.

INTRODUCTION

Cloud Computing is an IT advancement enabling infrastructure and software delivered as a service than an individual product. A paradigm shift from hardware or software product entities used as shared services, accessible from anywhere anytime. Cloud Computing offers cost benefits in terms of pay as go model for infrastructure resources, application software or data storage as a major shift in IT spending and developing IT solutions.

Cloud computing, a virtualized and managed offerings helps organizations services to be used as distributed offerings located anywhere and customized on fly. These services and software are only as far away as an Internet or mobile phone connection (Greengard, S.,2010). Cloud computing as a global reach of infrastructure and software services has made its presence as a must have day to day need for running business for individuals, groups, companies, states and countries.

International Data Corporation (IDC, a market research company a subsidiary of International Data Group) published study on the worldwide Cloud 2016 top 10 predictions (Figure 1). Each bubble's size

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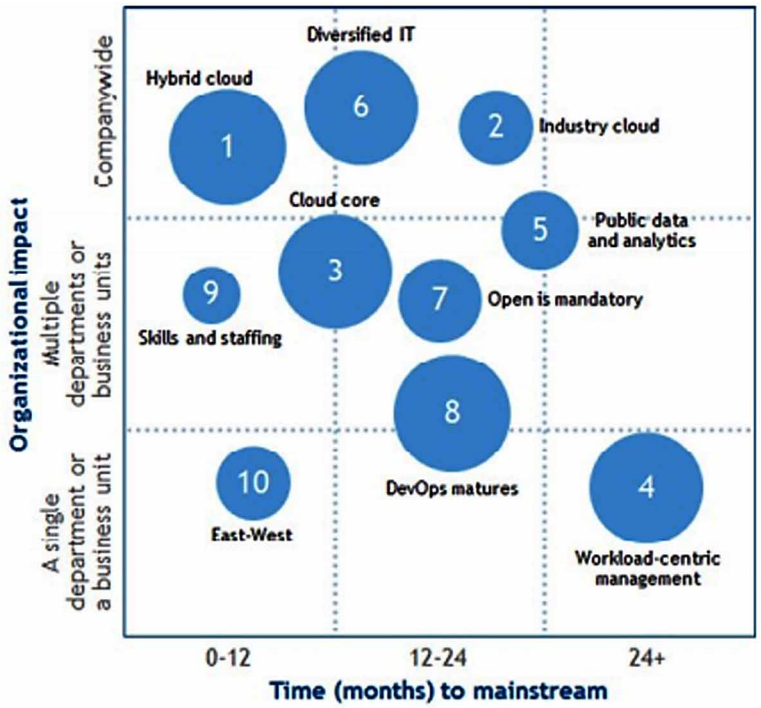
Figure 1. Worldwide Cloud 2016. Top 10 Predictions https://www.idc.com/getdoc.jsp?containerId=259850 (Document is available through registration).



provides a rough indicator of the complexity and/or cost an enterprise will incur in acting on the prediction. Based on results from IDC's Cloud View Survey, more than 43% of organizations expect that within five years, the majority of their IT capability will be delivered through public cloud services, and that within three years, they will access 78% of IT resources through some form of cloud — public, private, or hybrid.

The cloud computing industry has been growing very fast. For instance, the cloud service market ranged between $46.3 billion reported in 2008 to $148.8 billion and is predicted to grow to $150 billion by 2014, and $222.5 billion market by 2015 (Mtebe & Raisamo, 2014). IDC predicts cloud IT infrastructure spending will grow at CAGR of 15.1% from 2014 to 2019, reaching $53.1B by 2019. By 2019, IDC predicts cloud IT infrastructure spending will be 46% of total expenditures on enterprise IT infrastructure. The worldwide cloud computing market grew 28% to $110B in revenues in 2015.Worldwide Public IT Cloud Service Revenue in 2018 is predicted to be $127B. Managed Services is projected to reach $256B by 2018. Emerging markets are predicted to be 21% of the Worldwide Public IT Cloud Services market by 2018 (Columbus, L,2015).

In developing nations, setting up a strong IT infrastructure backbone brings in challenge due to the limitations on availability of required resources such as broadband, land, power and cost involved. Cloud computing helps entrepreneurs, small, medium and large scale businesses, government and educational institutions in using low cost IT solutions with limited or no local IT infrastructure. "It has the potential to level the playing field because it breaks down barriers to entry," says Steve Bratt, CEO of the nonprofit World Wide Web Foundation (Greengard, S,2010).Developing countries are looking forward to fast