

Factors that Determine the Adoption of Cloud Computing: A Global Perspective

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ABSTRACT

Cloud computing has spread within enterprise faster than many other IT innovations. In cloud computing, computer services are accessed over the Internet in a scalable fashion, where the user is abstracted in varying degrees from the actual hardware and software and pays only for resources used. This paper examines the adoption of cloud computing in various regions of the world, as well as the potential of cloud computing to impact computing in developing countries. The authors propose that cloud computing offers varying benefits and appears differently in regions across the world, enabling many users to obtain sophisticated computing architectures and applications that are cost-prohibitive to acquire locally. The authors examine issues of privacy, security, and reliability of cloud computing and discuss the outlook for firms and individuals in both developing and developed countries seeking to utilize cloud computing for their computing needs.

Keywords: *Cloud Computing, Computing Architecture, Developing Countries, Enterprise Computing, IT Infrastructure, Software as a Service*

INTRODUCTION

Cloud computing is a computing paradigm shift in which server hardware and software are not located onsite, but instead, accessed over the Internet on demand in a dynamically scalable and virtualized form.

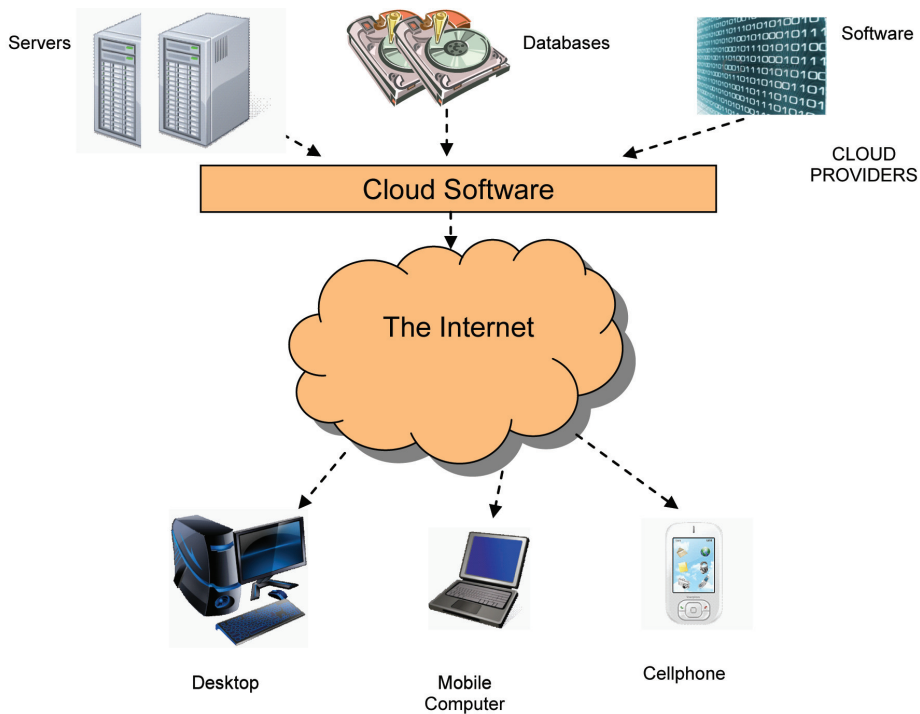
According to the Gartner Group, cloud services revenue is forecast to exceed \$68 billion in 2010—a 16.6% increase from 2009 (DeFelice & Leon, 2010). The number of people subscribing to mobile cloud apps is also forecasted to

rise from 71 million to nearly a billion by 2014 (Cherry, 2009).

These back-end resources exist in a “cloud”, namely a mix of typically remote computing resources that are accessed through the Internet (Hayes, 2008; Mell & Grance, 2010). Cloud-based services present an abstraction layer to the user that eliminates the need for the user to configure specific devices (see Figure 1).

Using virtualization, clients share a mix of servers, hard drives, data communications devices, and memory (Cervone, 2010). In additions, such services are monitored, with the user paying for only what computing resources they use, in a metered fashion. The cloud

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Figure 1. Cloud computing

appears as a single point of access for all the users' needs.

The growing popularity of the new phenomenon stems from the attractiveness of the organization not having to maintain computing infrastructures in-house. IT can now use new software or IT infrastructure services on the fly without having to pay for in-house software or hardware. This drastically reduces the cost of deploying applications (Cusumano, 2010; Durkee, 2010).

These subscription or pay-per-use services can help to reduce implementation times for even large systems and extend the IT capabilities of the firm in a flexible fashion (King, 2010).

The New York Times offers a prime example of enterprise cloud computing. Having digitized over a century's worth of newspaper pages, it converted them to browser-friendly PDF format and deployed them to the cloud in a matter of days (Golden, 2009).

Additionally, organizations can gain access to computing power they cannot afford to buy. Universities and biotech companies for example, often lack in-house massive computing power to conduct certain types of research. Many are now looking beyond the walls of their institutions and turning to cloud computing as a solution (May, 2010; Thilmany, 2009).

There are generally understood to be three types of cloud computing, namely software (or applications), platforms, and infrastructure. They are known respectively as SaaS – software as a service; PaaS – platform as a service; and IaaS – infrastructure as a service.

At the low end of cloud computing are the email services that millions are familiar with, such as Yahoo mail, Gmail and Hotmail. The email servers and users' email are stored on the cloud via the Internet, managed by Yahoo, Google, and Microsoft. Access takes place through the Internet and consumers get the ben-

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