WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

A Walk in the Cloud Computing: Past, Present and Future

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ABSTRACT

Chances are that you use *Cloud Computing*. If you use online photo storage or word processing or online e-mail or an online spreadsheet or online data storage or any other Internet-based application, you use *Cloud Computing*. *Cloud Computing* is not mysterious, although it is the highest of high technology.

Internet-based applications appear daily, such as online slide show creation, online design tools, online mind mapping and file conversion, collaborative software, social media, etc. Some applications are easy to use and others are wanting.

Communicators working in high tech are familiar with *Cloud Computing*, but practitioners in other disciplines might not be. Perhaps the key question for the rest of us is why one would move from PC-based applications to Internet-based software? One answer to that is some applications like social media are only on the Internet while others make work easier. A second answer is that it is inevitable communicators will transition to Internet-based applications.

There are technological, economic and communications reasons for why *Cloud Computing* is becoming common. Technologically, we use *Cloud Computing* because we can. Economically, there is less expense, and finally, it makes interactivity easier to achieve with target audiences. On the other hand, there is at least one downside to *Cloud Computing* -- security.

Before we discuss *Cloud Computing* and how it impacts, we should define it and trace how we got to where we are. *Cloud Computing* in some ways is back to the future. In others, it is a new way of relating to individuals, cultures and societies with implications that few understand.

Early days: The Mainframe

Sixty years ago at the dawn of computers, one stood by a warehouse-sized machine and fed it spools of paper tape. Applications and data were on the tape. The machine performed calculations then spit out answers. The computer, being a behemoth, was housed in a special climate-controlled facility and surrounded by technical acolytes as if it were a modern god. Soon, aptly named “dumb terminals” were hooked to the mainframe so one could enter data remotely. The distance of terminals from the mainframe was extended through clunky telephone links. Processing power, applications and data storage resided at the computing centre, often in a well-protected bunker. Users were captive to data and applications provided, and there was limited mobility in using the mainframe unless one could find a terminal. The entire time-sharing industry in computing was tied to this model. Older communications practitioners, nearing retirement, remember the days when they waited for terminal time at their universities or when they ran decks of 80-column cards through readers to enter data into a mainframe.

The PC Era

When the Apple II, MAC then IBM PC and their imitators appeared in the late 1970s and early 1980s, a shift occurred in computer use. Individuals bought their own CPU, data storage and applications. These conferred hitherto unknown freedom in processing and that freedom was only limited by processor power, applications and data availability. However, freedom had a penalty that frustrated technologists and managers alike. Collaborative work was difficult. Data became distributed, hard to find, and mobility was an issue for a reason opposite from the centrality of mainframes. If one left the office with data on a personal computer, it was absent unless the individual sent a floppy disk with the data back to the office or, unless the data was entered again at the office. There was also huge waste in underused or inefficient use of processing power, data storage and applications. Several solutions to this problem arose through the late 1980s and the 1990s. Some of them were focused on the office, and some on individuals working outside the office.

In-office applications saw the rise of the Local Area Network (LAN). These started as personal computers connected in a ring from one computer to another. This transitioned to personal computers connected as well to a storage and applications computer in the centre called a server. These applications

were limited to the power of individual PCs and the speed of the LAN. Both were poky, and data was still largely distributed among individual PCs with limited mobility. Floppy disks were the order of the day when one shipped data outside of the office. WANs (Wide Area Networks) followed LANs. These connected LANs in an office campus or in a region. Later they became networks that connected entire companies no matter where they were located geographically.

The nature of WANs and LANs was that all processing power, applications and data storage were contained within their boundaries. There were no connections outside the WAN or LAN. One could work more or less efficiently inside a company but not outside of it and mobility was limited to improving, but still clunky, dial-up communications.

In the 1980s and early 1990s, private online services arose to prominence with email applications that personal computer users could subscribe to. The first was CompuServe (founded in 1969) followed by America Online (AOL). These offered an amazing benefit at the time that one could e-mail and exchange messages and files with others elsewhere in the world, if they subscribed to the same service. Private online services were not connected to enterprise LANs and WANs, but they suggested a future of what could happen.

The Internet and the PC

All this time, the Internet had been in existence as a university and defence based network. Implemented in 1969, it was text-based with a technical bent, so few outside of engineering and science used it. That changed with the arrival of the Web in the early to mid-1990s. The Web drove creation of the Internet we know. E-mail moved from private online services to the Internet while web pages soared from dozens to thousands and then, millions. The amount of data stored on the Internet rose dramatically to where today there are trillions of bytes of information of nearly every kind stored somewhere. Companies realized their brand presence is as essential online as it is in any other communications medium. The Internet added simplicity and complexity to processing power, data storage and collaboration. Increasingly powerful servers used both by Internet service providers and by enterprises provided faster processing, more robust applications and faster collaborative work. They allowed centrality for data storage needed by all, while PCs continued to handle local data storage for individual needs. Connection to the Internet opened vast stores of data and communication unavailable before. Limited dial-in mobility moved to broader availability through wireless applications – sitting in airport terminals and checking one's e-mail by WiFi.

Technologists considering the power of servers and the Internet saw an opportunity to cut back on wasted CPU cycles, unused storage and inefficient use of applications. They invented the "Thin Client" that removed hard disk storage from the PC and placed it on the server that delivered the data and applications users needed. The PC was left with a CPU. This allowed centrality for and control of data needed by all and more efficient use of applications.

Connection to the Internet opened stores of data and communication. However, the idea was before its time. Neither PCs nor servers had enough power to make the system work well at first. Networks were slow internally and externally.

The Cloud

Storage and processing for the Internet created huge data centres filled with thousands of computer servers that fed this data to an insatiable and growing global population of users. No one organization owns these centres, although there are large operators like Amazon, Google, IBM, Microsoft and Yahoo that have built capacity and applications. As data centres grew, so did the idea that the Internet was turning into something like an electric utility. One should be able to plug into the Internet from anywhere and get the processing, applications and data one needs. This idea required all these data centres to work together, however, using standard software and systems, so users could draw on power and applications wherever and whenever like plugging a lamp into a wall. This idea of computing is rapidly emerging as the *Cloud*. The *Cloud* has slowly taken the central position for data, applications, mobility and source of social media, multimedia and entertainment. The capacity of a *Cloud* is beyond any one company to achieve but combinations of server warehouses spread about the world generate vast processing, storage and throughput power.

The term *Cloud Computing* is relatively new, and some say it is no different than *"Utility Computing,"* the idea that the Internet is the electric company. The image of a cloud comes from engineers and technicians who use a fluffy cumulus cloud in wiring diagrams to designate a network built and maintained outside of an organization. The faster Internet connections have become – 10 mbps, 20 mbps, 40 mbps, the more applications and storage have moved to the *Cloud* and out of internal servers and PCs. In fact, all processing power, applications and storage a communications professional might need today are available already through **Cloud Computing.**

Cloud Computing requires high-speed broadband service and enormous data storage, but current predictions are that nothing will stop the Internet from reaching petabyte size and speed. That is a thousand trillion bytes of storage, an unimaginable size, and equally astonishing speed. This means millions of people can download multi-billion-byte, high- definition, feature-length movies at the same time without slowing down or straining the Internet. There are serious capacity and economic issues to achieving this scale, but Internet service providers are moving to solve them.

The uses of *Cloud Computing* for professional communicators are ubiquitous, especially since high-speed speed service comes not only through fiber-optic landlines but also through WiFi and cellular broadband communications.

Cloud Applications

Here are just a few *Cloud* applications you could use at the time of writing.

·**Google Docs:** http://www.google.com/ Online word processing, spreadsheet, presentations and collaboration software.

·**EFAX**: http://www.efax.com/ Faxes and voice mail by e-mail.

·**YouTube**: /www.youtube.com/ Online storage of videos.

·**Webex:** http://www.webex.com/ Online meetings.

·**YouSendIt**: http://www.yousendit.com/ A digital delivery service for large files.

·**Gliffy**: http://www.gliffy.com/ Online diagram drawing.

·**Yahoo! Calendar**: www.yahoo.com. An online calendar.

·**Mozy:** http://mozy.com/. File backup service.

·**LinkedIn:** http://www.linkedin.com/home Social networking for business.

There are many more than what is listed here and many services duplicate one another, which means there will be consolidation at some point. The communications practitioner who does not use some Cloud Computing service already is in a minority. The question is how to use Cloud Computing going forward – as an eclectic series of applications or an integrated service?

A way to think about the *Cloud*

There are several considerations in thinking about *Cloud Computing*:

·**Time.** *Cloud Computing* provides 24/7 presence. Communicators who need that need *Cloud Computing*. It should be as easy as flipping on a light switch, although it isn't yet for some services, such as video conferencing – that is, depending on where one is in the world.

·**Place.** If clients are far-flung, *Cloud Computing* is a natural solution.

Conversely, if clients are close by or down the hall, there is probably little need to get involved in *Cloud Computing*. Increasingly with global business, even internal clients are located around the earth.

·**Method of working.** If one needs to work closely with clients, *Cloud Computing* is the way to approach it. If one completes assignments and projects without need for interaction, there is little need for *Cloud Computing*.

· **Data and application needs.** *Cloud Computing* provides the ability to process and mine mountains of data while doing one's work. That is the benefit of search engines and of continued increase of data storage online. *Cloud Computing* already offers the world's largest library to users, and it is getting larger every second. It is unlikely there are many communications practitioners left who do not use the Internet as a resource in some way.

Appliance and Network: Full use of *Cloud Computing* requires a network robust enough to deliver applications and data and an appliance that can process them. That appliance will have a powerful CPU, multiple network connections from direct linkage through Ethernet cable to WiFi and cellular communications cards, a keyboard and phone. Some say Apple Computer's iPhone is the nearest application to a *Cloud Computing* device developed thus far. More such devices are on the way. They will be limited, however, by the networks to which they are connected. Some communicators today can take advantage of *Cloud Computing* and others cannot. It will be a matter of time before most can.

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