INFORMATION SYSTEMS AND NEW APPLICATIONS IN THE SERVICE SECTOR: CURRENT STATE AND FUTURE TRENDS

The computing era started in early 2000 and is highly present now and most likely will be in the near future (Benlian, Hess, & Buhmann, 2010). Cloud computing grows at a very fast pace. Cloud based computing and cloud based e-commerce are among the hottest topics in the IT industry. They are also two of the most widely discussed topics among IT professionals. Cloud based e-commerce is a relatively new and fast growing field.

Cloud computing is a way to increase the capacity or add capabilities dynamically without investing in new infrastructure, training new personnel, or licensing new software. It extends Information Technology’s (IT) existing capabilities (Subashini & Kavitha, 2010). Cloud computing is a set of web-based applications that are stored on remote servers and accessed via the Internet using a standard Web browser. The word “cloud” is really used as metaphor for Internet. Typical cloud computing providers deliver common business applications online that are accessed from another Web service or software like a Web browser, while the software and data are stored on servers (LeClair, 2009). Consumers are able to access applications and data from a “cloud” anywhere in the world on demand. In other words, the cloud appears to be a single point of access for all the computing needs of consumers. The consumers are assured that the cloud infrastructure is very robust and will always be available at any time (Holtsnider & Jaffe, 2010).

There are three broad categories of clouds: public, private and hybrid. Public clouds provide standardized services on provider’s cloud and access by subscription. Amazon and GAE are two well-known providers of public clouds (Campesto & Nilson, 2010). Public clouds are good if one needs lots of scaling and generally is not concerned with security. Private clouds provide the same services as public the only difference is that you are behind a firewall (McDonald, 2010). Private clouds are good if one wants to own everything and scaling is needed. The downsides of a private cloud are that it is the least flexible, plus it has higher operating cost.

Hybrid clouds are private clouds that also can access resources outside the firewall during period of high demand (Chandra Misra & Mondal, 2010). They maintain some data storage in-house plus rent bandwidth with a pay-as-you-go plan. Large companies may prefer hybrid clouds because they can lower their hardware cost, avoid a complexity of migrating data to a public data and avoid exposing sensitive data in public cloud.

Over the past few years, an increasing amount of both popular and scholarly attention has been focused on Web 2.0 and electronic government, or e-government. That tendency towards web based technology among government entities is stimulated by The E-Government Act of 2002 which was put in place to
improve management and promote Internet-based services for citizens (Noyes, 2008). Defined as the electronic provision of information and services by governments 24 hours per day, seven days per week (Norris & Moon, 2008), e-government is said to expand and extend the ability of government organizations to serve their constituencies.

The phrase Web 2.0 has been used for over ten years now (Hinchcliffe, 2010). In its origins, no one could have imagined Web 2.0’s reality today. This expression was first used to describe the second generation capability of the World Wide Web. It was meant to explain how the internet was expanding from basic web pages to a collaborative superpower which could penetrate the corporate world in many ways. Pellegrino and Eggers (2010) point out that before the term Web 2.0 was defined boundaries of Web 1.0 had to be delineated. Web 1.0 revolved around an idea of one-way communication, where information was displayed on static web-pages connected to limited research capabilities. With Web 2.0, communication turned into multi-direction and multi-level conversations as well as fast and secure channels for exchanging information. Based on that successful and collaborative platform, e-Government’s goal is also to promote a host of other, mainly positive, benefits to both government and the private part of American society.

To certain extent, technology challenges are similar in public and private sectors. Both of those entities use technology for information sharing and collaboration, while consolidating infrastructure, information security and integrity. Despite similarities, government has different culture and approach to technology and such differences included lack of top-down technological leadership, focus on internal processes, not citizen outcomes and a belief that governments cannot be early adopters of latest technologies (Kumar, Mukerji, Butt, & Persaud, 2007). Consequently, what seemed to be a set of noble ideas in 2002 appeared to work well on national level, but it became a failure several years later, as state government system analysts and designers remained reluctant to adopt the E-Government Act or latest Web 2.0 technologies (Zhao, Zhao, & Zhao 2010). Fortunately, today, the Web 2.0 landscape looks much better on the state and local government levels.

Part of the emerging acceptance of Web 2.0 in today’s government can be attributed to success of political campaign of the current president of the United States (Relly & Sabharwal, 2009; O’Donnell, 2010). The Obama-Biden campaign demonstrated that traditional top-down, presidential campaigns cannot compete against self-organizing armies of millions motivated by an inspiring candidate and empowered by a Web 2.0 savvy campaign team. The revolutionary changes in business, campaigning and collaboration driven by the new web technology have big implications for governance. O’Donnell (2010) adds that, with President Obama’s commitment to bring his bottom-up, participatory model to the federal government—issuing a memorandum on transparency and openness in government to all executive department and agency heads on his first full day in office—government agencies are under intense pressure to keep up with the president.

CURRENT RESEARCH

Cloud Based E-Commerce Infrastructure & Services

Industry analysts have made optimistic projections on how cloud computing will transform the entire computing industry. Recently, several academic and industrial organizations have started investigating and developing technologies and infrastructure for cloud Computing. Cloud based computing worldwide spending was only 5 percent (17 billion) in 2009. However, in 2013 worldwide spending is going to be
10 percent, a whopping number 44 billion (Talbot, 2010). One International Data Corporation (IDC) report indicated that cloud-computing spending will increase from $16 billion in 2008 to $42 billion in 2012 (Rittinghouse & Ransome, 2010). According to Hewlett-Packard Co. Chairman and Chief Executive, Mark Hurd, cloud services revenues on pace to exceed $56 billion in 2010, an increase of 21% from a year ago. Overall, the cloud market is expected to reach $150.1 billion by 2013. These are very impressive numbers especially when we take into consideration the fact that there is a broader decline of more than 5% for the information-technology industry (Cheng, 2009). Those forecasts and statistical data indicate that cloud computing is going to grow and develop even further in near future because companies businesses are willing to invest money in these new technology.

Cloud E-Commerce is becoming so popular for many reasons. One of the major reasons is that it helps to reduce expenditure cost on hardware, software, and services substantially because users always pay only for what they use. Cloud computing is usually billed on pay-as-you-go basis and consumers can benefit from low barriers to entry, shared infrastructure and cost, low management overhead, and immediate access to broad range of applications (Holtsnider & Jaffe, 2010). Therefore, cloud computing is more immediately appealing to small and medium-size businesses that lack resources to purchase and own their own software and hardware. Especially it is beneficial for new businesses because time for a newly created company is extremely critical. With cloud based IT infrastructure one can immediately start his/her business operation which could in turn give you better chances to succeed. Plus any company could benefit from online data storage, which is major issue for any business. The company’s essential data can be accessed from anywhere at any given moment. All you have to have is Internet connection. Not to mention that storage in the cloud can be less expensive than storing data yourself, and it can be more scalable, more efficient and more secure (Rash, 2010).

Due to so many advantages of cloud computing, every day more and more companies are trying to enter this field and become cloud providers. Let us take a closer look at a typical cloud computing company (cloud e-commerce company). Generally speaking, a cloud e-commerce company is a company that provides a service or product that belongs to the Software Platform Infrastructure (SPI) Model for cloud computing. Each SPI model addresses a specific business need. These are the SPI models: Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS) (Durkee, 2010). Software as a Service (SaaS) provides software application over the Internet. SaaS provides cloud–based software services such as customer resources management or enterprise resources management (Baer, 2008). A good example of SaaS would be a NetSuite’s comprehensive business management suite.

Platform as a Service (PaaS) provides a development environment. It is actually very similar to SaaS, the only difference is that consumers use SaaS and developers use PaaS (McDonald, 2010). For instance, Coghead, one of a string of start-ups backed by SAP Ventures, offers a Web-based platform for enabling power users from the business—rather than developers—to compose applications using rebuilt components, such as rudimentary CRM and project management with contact management quote management, sales lead analysis, to-do lists, expense trackers, and others through a process akin to dragging and dropping widgets onto a form (Anonymous, 2008).

Infrastructure as a Service (IaaS) provides the physical hardware and software required by companies on the Internet. The basic requirement for the consumer is to send a provisioning request for the number of services with data storage requirements. The services are provisioned and the access to the services is granted by the service provider. IaaS provides a cloud-based platform for services, storage, memory, bandwidth and computing power on demand. Usually offerings of this type are delivered as an operating system on a server with some amount of storage and network transfer. These offerings can
be delivered as a single server or as part of a collection of servers integrated into a virtual private data center (VPDC) (McDonald, 2010; Barman, 2009).

Although, there are many cloud computing vendors on the market the current major ones are: Amazon EC2, IBM Cloud labs, Google App Engine (GAE), and Microsoft Azure. Amazon Elastic Compute Cloud (EC2) provides a virtual computing environment that enables a user to run Linux-based applications. The user can either create a new Amazon Machine Image (AMI) containing the applications, libraries, data and associated configuration settings, or select from a library of globally available AMIs. The user then needs to upload the created or selected AMIs to Amazon Simple Storage Service (S3), before he can start, stop, and monitor instances of the uploaded AMIs. Amazon EC2 charges the user for the time when the instance is alive, while Amazon S3 charges for any data transfer (both upload and download) (Campesto & Nilson, 2010).

Google App Engine allows a user to run Web applications written using the Python programming language. Other than supporting the Python standard library, Google App Engine also supports Application Programming Interfaces (APIs) for the data store, Google Accounts, URL fetch, image manipulation, and email services. Google App Engine also provides a Web-based Administration Console for the user to easily manage his running Web applications. Currently, Google App Engine is free to use with up to 500MB of storage and about 5 million page views per month.

Generally available since January 2010, Windows Azure is essentially a cloud-based version of the Windows Server OS. Likewise, SQL Azure is a cloud-based version of the SQL Server 2008 relational database server. Unlike Windows Server, which is often used for file and print services, Windows Azure is an application platform. It runs the same types of web applications that run on Windows Server: C++, C#, and Visual Basic (VB). Pricing is structured on an as-used basis or by buying longer-term contracts at fixed prices. SQL Azure offers a subset of SQL Server’s usual features (Otey, 2010).

While a lot of businesses embrace these relatively new trends towards cloud computing many of business executives are still hesitant to jump into the cloud. An issue of a security is a major concern for business owners. In February 2010 survey of 518 business technology pros, security concerns topped the list of reasons not to use cloud computing services (Shipley, 2010). The Internet has security issues, and since cloud computing is in the Internet, cloud computing will have those security issues. To demonstrate potential security shortfalls the study was done by three computer scientists at the University of California, San Diego, and one at MIT. They hired some virtual machines to serve as targets and others to serve as attackers—and tried to get both groups hosted on the same servers at Amazon’s data centers. They succeeded in placing malicious virtual machines on the same servers as targets 40 percent of the time. This interesting experiment revealed the vulnerability and potential security exposure that cloud computing faces in every day operations (Talbot, 2010).

Another reason why businesses are hesitant to use cloud computing vendors is that they are afraid to store their internal data on the computer that is located externally in a cloud, especially, if the data are located in the other country. For instance, Asian companies have been concerned about data stored in USA because under jurisdiction of the U.S. Patriot Act, the U.S. Government can access that data very easily (Smith, 2009). Even more: depending on the nature of your business you might need to achieve and maintain data privacy requirements for Payment Card Industry Data Security Standards (PCI) compliance, Health Insurance Portability and Accountability Act (HIPAA) compliance, Sarbanes–Oxley Act (SOX) and so on, then use of cloud computing would increase risk of compromising sensitive data, because you have less control over data storage in a Cloud vendor facility (Barman, 2009). A possibility of power outage contributes to possible data loss issues. Even though it is a concern many of broadband
providers guarantee 99.9% uptime and to increase system reliability even more you can also set up your system to ‘failover’ safely, with a router that uses a 3G wireless dongle as backup (Clark, 2010).

We mentioned earlier that one of the big advantages of cloud computing is cost control. However, it is not always the case. Sometimes even if you are unhappy with the services that you receive from your vendor you cannot change your vendor without some major changes to both your software and your data and that could significantly increase your cost (Smith, 2009). Once you select your cloud computing provider you depend on him. Since each cloud vendor offers unique service and unique ways to communicate with the computer your switching cost most likely to be very high.

Use of Web 2.0 Tools for E-Government & Service Sector

Many of us wonder why Web 2.0 approaches create more value more rapidly than other technological models. What we today observe as a multi-directional conversation appears to be the answer key. The reason for such success of Web 2.0 is something called architectures of participation, which, as Adebanjo and Roula (2010) add, is the combined network effect of pervasive two-way participation (blogging, wikis, media sharing, social networking, etc.) which allows value to be built quickly from a collective wave of contribution. A Web 2.0 application often consists of nothing but a framework to elicit widespread input from thousands or even millions of potential contributors.

Web 2.0’s impact on the government has coined the new phrase “Government 2.0”, also known as e-Government. Government 2.0 refers to a new style of government that makes information readily available to all citizens of the United States who have access to the internet. One of the key intentions behind this initiative is to make the government more transparent to the general public. In an age where information sharing is extremely popular, the government would like to participate as well. Similar, Mintz, & Hughes (2009) explain how the administration is “…making data available through multiple channels and developing policies that reflect an open government accessible by a growing list of Web 2.0 tools” (p.25). Ressler (2009) takes this idea one step further, adding another important element to that equation, by noting that Gov 2.0 is not only about “openness, transparency, and collaboration”, but also promotes the idea that “the voices of the many are smarter than the voice of one” (p.10).

The genesis for this was the open source movement of the 1990’s, which demonstrated that very complex and high-value outcomes could occur if anyone and everyone were encouraged to contribute and the community around the effort ensured that quality was maintained (Albors, Ramos,f & Hervas, 2008). As this decade closes, architectures of participation are now routinely embedded into product development, customer service, marketing, lines of business, and just about everywhere workers and government representatives must come together in teams (Adebanjo & Roula, 2010). This unfolding story is routinely found in the headlines of traditional media: virtually everyone in United States is familiar with the hugely popular, rapidly expanding social networking sites like Facebook and Twitter. As Scheir (2008) reports, government agencies such as the Army or U.S. Air Force use them as well, but as we observe today, Web 2.0 usage in e-government efforts and its services aren’t limited to those large organizations.

What brings an exponential benefit to society is not so much the underlying technical software layer that makes Web 2.0 possible, but how it enables us to organize and work together as communities and how it allows the government to fulfill its new transparency initiatives (Bertot, Jaeger, & Grimes, 2010). The new technical vision of Web 2.0 includes re-use and “building on the shoulders of [Internet based] giants”. With that core principle in mind, consumers, businesses and local governmental services can now build applications on top of existing applications, so-called software mashups, with relative ease
(Yang, Raskin, Goodchild, & Gahegan, 2010). They can remix data from multiple sources, creating ad hoc supply chains with business partners, harness user-generated content, participate in communities of individuals with similar affinities as well as aggregate global knowledge and much more. Web 2.0 has come to represent a set of best practices to get the most value from the Internet by taking advantage of its intrinsic power to reach people regardless of their physical location, time of day or type of a digital device (as long as some level of network connectivity is available) to then distribute and aggregate helpful services and fast information.

During the recent couple years, government agencies much smaller than the Army or U.S. Air Force have applied the concepts of mashups to accelerate the speed, accuracy and user-friendliness of their messages to and from local communities, states as well as entire regions (O’Donnell, 2010; Pellegrino & Eggers, 2010). For instance, the government of San Francisco, California, utilized Web 2.0 in a mashup of Google Maps, an online database of parking lots in the area and their existing web hosting solution to create dynamic Internet application that lists available accessible parking spaces within a customized radius from someone’s current geo-location, near a specific address or along user defined route of travel. Washington, D.C. launched a mashup that, among other services, provides a Snow Response Reporting System, combining a web map interface, Google Maps database and live camera feeds to assure citizens’ safety and share up-to-date information about road traffic conditions. Boston’s Department of Transportation has become famous for its groundbreaking transparency in recent public sharing of scheduling data and geographic information; so that notoriously technical Bostonian crowds of software entrepreneurs could incorporate it in their latest community efforts. Osimo (2009) points out that such a 21st-century alternative to hiring consultants, who develop intelligent software at exorbitant costs, demonstrates a great success of local government Web 2.0 services.

In similar fashion to Web 2.0 implementations listed above, Miami, FL shows another impressive example of that is an insightful online application. The local government launched a service called Miami311Could App, which utilizes a cloud computing platform. Miami 311 is a public-facing, open government transparency application where the citizens of Miami can monitor and analyze non-emergency event information happening in their area. Citizens can report non-emergency requests, like pothole repair or missed trash pickup by dialing 3-1-1 on their telephone. They can then log on Miami 311 to monitor the progress of their request. Miami 311 also serves as a dashboard for City Commissioners to see and monitor citizen requests in their district. According to a Microsoft Case Study (2010) on the City of Miami, this system integrates with the larger Miami-Dade Motorola CSR system and will soon be extended to take service request input from citizens. Added combination of Microsoft Bing’s public map database, MapDoNet service, Microsoft Azure cloud computing techniques and rich interactivity of Silverlight 3 web development platform allow the government of city of Miami, FL to provide a free and cutting-edge Web 2.0 mashup for its citizens.

Like all government initiatives, this has created a new problem. Because the United States Constitution deems equality for all men, the government must not discriminate against any citizen who cannot provide themselves or their families with internet access, either because of their geographical location, or because they cannot afford internet services. For Government 2.0 to work, our government must now find a way to provide internet access for people who cannot provide it for themselves, because one of the key factors in e-Government is allowing all citizens the ability to participate, if they so choose, in their own government.
FUTURE DIRECTION

Cloud Based E-Commerce Infrastructure & Services

Promising Outlook

Even though cloud computing has some disadvantages, according to IT experts the outlook of cloud computing is very promising for a number of reasons. Cloud computing provides an Internet-based platform that lays the foundation for a new generation of globally accessed, highly scalable cloud-based applications (Durkee, 2010). Cloud computing provides an opportunity for creation of a new type of businesses that were not possible only a few years before. It gives an access to unlimited IT resources at the modest cost of lowering barriers for entry. Your business’s geographical location is becoming more and more irrelevant. Cloud computing is giving an opportunity for software product developed in the USA to be extended and supported by a developer in another continent, like Asia (Greengard, 2010). Some observers even believe businesses will eventually run no servers of their own, but simply rent access to a larger vendor’s cloud of computer resources.

Strategic Tool

Cloud computing is playing a big role in the Obama Administration’s new FY2011 budget. Federal CIO Vivek Kundra contends the U.S. government can acquire technology faster and at lower cost through cloud computing, leaders in the public and private sectors are more than ever working closely to use cloud computing as a strategic IT tool to help transform government and make them more effective and efficient, which means that government spending on cloud computing will increase significantly and that could stimulate cloud computing vendors to increase their R&D and capital investment on cloud computing infrastructure in order to get government contracts (PR Newswire, 2010).

Real Value

Corresponding to Chandra Misra & Mondal (2010), as the newest offering as service over the ubiquitous Web, cloud computing has been considered as a much hyped phenomenon in the IT and business world promising to deliver a host of benefits. Companies need to look beyond this hype and seriously consider the real value of incorporating the Cloud in their own businesses. Companies should analyze several characteristics of their own business as well as pre-existing IT resources to identify their favorability in the migration to the Cloud Architecture.

Trade-Off Balancing

Truong & Dustdar (2010) warn that scientists need to decide which parts of their applications should be executed in cloud computing systems in order to balance the trade-off between cost, time and resource requirements. They present a service for estimating, monitoring and analyzing costs associated with scientific applications in the cloud. This model could eventually be integrated into cloud resource management and execution services to support on-the-fly resource scheduling.
Potential Risks

Subashini & Kavitha (2010) claim that security is one of the major issues which reduce the growth of cloud computing and complications with data privacy and data protection continue to plague the market. Cloud service users need to be vigilant in understanding the risks of data breaches in this new environment. The advent of an advanced model should not negotiate with the required functionalities and capabilities present in a current model. A new model targeting at improving features of an existing model must not risk or threaten other important features of the current model.

Vertical Clouds

Nicholas Carr recently commented on the possibility of so-called vertical clouds that offer special resources or services to customers with specific needs. According to Mr. Carr, IT expert, vertical clouds would provide possible resources of addressing issues of information security crucial to industries such as health care and financial services. In simple words there is a high potential for growth and development of new modified specialized cloud computing services in industries such as financial industry and healthcare (Schick, 2009).

Grid Computing

As indicated by Schwiegelshohn et al. (2010), the underachievement of grid computing may have led to claims that the grid concept as a whole is on its way to being replaced by cloud computing and various X-as-a-Service approaches. Although there are shortcomings in current grid systems, they are convinced that the concept as a whole remains valid and can benefit from new developments, including cloud computing. Further research is required in order to turn this concept into reliable, efficient and user-friendly computing platforms.

New Abstraction Layer

Rodero-Merino, Vaquero, Gil, Galán, Fontán, Montero, & Llorente (2010) discovered that users are not fully realizing the implicit promise of clouds (leveraging them from the tasks related with infrastructure management). A reason for this is that current clouds offer interfaces too close to that infrastructure, while users demand functionalities that automate the management of their services as a whole unit. To overcome this limitation, Rodero-Merino et al. (2010) propose a new abstraction layer closer to the lifecycle of services that allows for their automatic deployment and escalation depending on the service status (not only on the infrastructure). This abstraction layer can sit on top of different cloud providers, hence mitigating the potential lock-in problem and allowing the transparent federation of clouds for the execution of services.

Based on the facts and data mentioned above we believe that cloud computing is here to stay. As you can see, a wide variety of E-Commerce companies offer solutions that range from user-oriented solutions to enterprise development platforms. At this point, cloud computing might not be for all businesses—and it is not going to replace all on-premise solutions in one day. However, we see that every day more and more private companies and government agency are moving to the cloud.
Use of Web 2.0 Tools for E-Government & Service Sector

More Involvement

Twenty years ago, people working for the Federal Government had access to the world’s best technology. Today, many government employees have better technology at home than at work. In reaction to those ominous observations, Sproles (2010) sees great potential for the usage of Web 2.0 in e-government, but he does not omit possible points of failure. On the other hand, Meijer and Thaens (2010) state that with proper application of IT strategy and business strategic orientation can be applied towards operational success of Web 2.0 in government.

We agree with Shuler, Jaeger, & Bertot (2010) and believe that the Government Printing Office’s Federal Depository Library Program (FDLP) is going to be affected the most. As technology and its security provide new presentation methods for various types of information, FDLP may need to transform from traditional printing plant to something else in the world of the Internet. Such a trend would have a drastically positive impact on the quality and accuracy of information available via public search engines, which could help us become better educated consumers and more influential contributors.

The future trend of e-Government may be leading our country into an age where the people can be more involved in politics than ever before. Their involvement can be both proactive and passive. Some citizens may choose to use e-Government tools as a platform to voice their opinions, while others may choose to quietly follow along what congress and their local governments are up to – as an alternative to watching the news on television. Overall, this seems like a great step in the right direction for our country.

New Tool (SBAT)

There is no doubt in our mind that Web 2.0 applications will continue to evolve and become more valuable to governments and their key stakeholders. However, government leaders must start down the collaborative path today to understand how these tools can drive their organization’s desired outcomes in the future. Rowley (2010) points out the importance of various stakeholder groups in success of e-government in such an extensive organization as the government. Rowley also proposed a new stakeholder benefits analysis tool (SBAT), which can be used to map stakeholder roles to stakeholder benefits. That tool has been tested by an expert group, and revised, so we are hoping that the government body starts taking advantage of it to accelerate future acceptance of Web 2.0 for e-government. Some of the possible stakeholder groups to analyze using SBAT include educational institutions such as public universities and libraries. The availability of majority of government’s information online, combined with the power of private search engines such as Google, ultimately allows every public or a university library to serve as an effective access point for e-government information.

Vulnerable Information

Personal privacy is also a cause for concern. The average internet user cannot fathom what happens to their information once they put it somewhere on the internet. Even the most knowledgeable and cautious users will, at some point, leave their information vulnerable. If even the most secure connection is hacked into, millions of people could be at risk of identity theft. After all is said and done, it will be the company who allowed this information to leak publicly that will incur the blame, not the individual who offered it. As Lyon (2010) describes “When customers do learn about privacy failings, they will
not be mad at themselves. Instead, they will blame the company they feel should have protected them” (p.26). It is extremely important for individuals and companies alike to invest in the proper amount of security for their (or their customer’s) private information.

In a much larger scale, if the government becomes too transparent, many security problems may arise, some of them as serious as national security. Probably the largest internet phenomenon is that once something is published on the internet, it will be there forever. The government will have to find a way to become more transparent while also closely censoring what becomes published information.

4-C Typology

Web 2.0 has also had a large impact on the service sector of our economy. Not only are product based companies required to use the internet to remain competitive in their respective industries, but service corporations now face the same obligation. Because services are not a tangible item, they become much more difficult to market on the internet. Everything from accounting services to consulting services to legal services must find a way to differentiate them from the competition.

In a marketplace that is constantly changing and evolving, sustainability becomes a firm’s most important goal. Wirtz, Schilke and Ullrich (2010) have developed a Twenty-First Century business model typology which will help companies create value by using the internet to their advantage. Their basic model is known as the “4C Business Model Typology” consists of four business models that can prove to be successful in the era of Web 2.0 technology. The models are content-oriented (such as Wikipedia), commerce-oriented (such as Amazon), context-oriented (such as Google), and connection-oriented (such as Facebook) (pp.274-5). According to this structured set of online business practice, if a company can find themselves operating in one of these four areas, they have the opportunity to gain sustainability and survive the Web 2.0 revolution while still turning a profit.

CONCLUSION

In the last few years, cloud computing has grown from being a promising business concept to one of the fast growing segments of the IT industry. Clouds have changed the way we think about IT infrastructure management. Cloud computing provides an opportunity for creation of a new type of businesses that were not possible only a few years before. It gives an access to unlimited IT resources at the modest cost lowering barriers for entry. Certainly, companies should analyze several characteristics of their own business as well as pre-existing IT resources to identify their favorability in the migration to the Cloud Architecture.

Web 2.0 does not only refer to a revolution in personal internet usage. There has also been a major shift that has affected businesses worldwide. Web 2.0 has changed the internet to an interactive information portal, where users proactively control their own experience. If corporations can harness and effectively implement what Web 2.0 technology has to offer, their potential competitive advantages will expand to a point previously unimaginable.

Web 2.0 technology is not just a trend. Web 2.0 is a shift in lifestyle, for people, companies, and government entities alike. To ignore its existence will leave you far behind society as a whole. It is imperative to embrace the technology available. The most difficult aspect to overcome about this behavioral shift will be the cultural changes. Our culture is changing, and change is hard for many people to understand.
and cope with. Once they get their feet wet, Web 2.0 technology’s offerings can have a profoundly positive impact on the way we do business, the way our government is run, and on how we live our lives.

REFERENCES


Wirtz, B., Schilke, O., & Ullrich, S. (2010). Strategic development of business models:


*John Wang*
*Montclair State University, USA*

*Peijun Guo*
*Yokohama National University, Japan*