“Web 2.0, dilemmas 1.0:

Essay on an Evolving Market”

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Abstract

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Abstract

Today the Internet is entwined into our everyday society. From the beginning days in 1980 to today, the Internet has been evolving. The creator of the World Wide Web, Tim Berners-Lee, envisioned that the Internet would be a system with everything connected to everything. The web today is changing with new applications arriving from outside the previous channels of the megalithic software companies. Thousands of individual developers are creating micro-applications to enhance the earlier framework of the web. This revolution has been coined “Web 2.0”. Many observers today are skeptical that Web 2.0 is really a revolution at all, but maybe is just a continuation of Berners-Lee’s original concept. This paper examines, based on a critical literature review, the discussions taking place regarding Web 2.0.

Introduction

The Internet is embedded in our society today. We use it everyday to communicate, inform and entertain ourselves. The medium we use now started with very humble beginnings, without the amazing applications we take for granted today. Services we use today, such as email, and web browsing started as creations of individual developers of computer code, who wrote programs to make the “primordial” Internet more useful. With the advent of a user-friendly browser, Netscape, a method to connect the masses with the Web was created. Interaction originally was more by consumers of information and less by contributors of information. Early users “browsed the web” seeking content provided by few. Today the tables have turned and many browse for content created by many. It has never been easier for a user to submit content, and to edit and criticize content as well. The explosion of content has created interest by users, which has sparked the minds of developers to make the user experience easier and faster. The overwhelming amount of new content has presented the problem of searching and cataloging the endless streams of new data. Companies have answered these challenges, and are working on better solutions everyday. Many solutions evolve into applications that create entrepreneurial opportunities. The opportunities are high on the minds of eager Venture Capitalists (VC’s) in Silicon Valley. They are beginning to see a return to the level of excitement of pre 2001, when a financial collapse occurred in the tech industry.
If a standard literature review is conducted along with keyword searches of the World Wide Web, relevant key words, such as “Web 2.0, Web 1.0, Google, Berners-Lee, Andreessen and many more” are obtained. We will venture into these topics in this work. This research also included international journals, smaller journals, conference papers and other literature that may be considered “grey” literature (i.e., popular articles, unpublished reports, and other documents), and some Internet (non-journal) materials.

The literature review revealed that though the subject of the Internet is well documented, the topic of Web 2.0 does not create a single mindset, but divides observers into discussion if new ideas are unique or simply small extensions and aberrations of old concepts.

1.0 Internet and Web 1.0

It is important to review the early days of the Internet and the World Wide Web (WWW) to understand the changes that have taken place, are taking place and will continue to develop in the future (Venkatraman, N. 2000, p.14,15,16). Extremely important are the lessons to be learned from the early concepts, ideas, successes and failures of the pioneers, such as Tim Berners-Lee and Marc Andreessen. The beginning of the Internet can be traced to the creation of the ARPANET in 1969 (McAdams and Nelson, 1995). The creation of the World Wide Web can be traced to Tim Berners-Lee (Anderson, 2007).

1.1 Tim Berners-Lee

Tim Berners-Lee is an Englishman, who in 1980 was a software consultant at CERN (The Particle Physics Laboratory in Geneva, Switzerland). According to a biography posted at www.ibiblio.org, Berners-Lee originally wrote a program called Enquire, which was a rudimentary project management tool (Anderson, 2007). The basic concept was to help Berners-Lee remember connections between various people and projects within a large organization, such as CERN (Berners-Lee, 1999). The core concept was the use of Hypertext, which had been theorized earlier by Vannevar Bush, and further developed by Ted Nelson and Douglas Englebart (ibiblio.org; W3.org).
Berners-Lee’s original proposal to CERN included a plan to develop an information system, one that would essentially create a web of information. His proposal to CERN received no reply, but he continued to work on what was to become the Hypertext Transfer Protocol (HTTP) language. Berners-Lee also created the Universal Resource Locator (URL) address system and the client program known as “WorldWideWeb” (Anderson, 2006; Wikipedia 2007). The pages used Hypertext Markup Language (HTML). His creations also include the first web server, for hosting the collections of data. Berners-Lee offered to sell his new creation to CERN, but was not successful. He received no license, patent or royalties for his invention, making the standards open to all.

Without success in selling his program, he turned to the Internet community, making his software available to everyone. Computer enthusiasts around the world began to set up their own servers. The beginning of the WWW was happening. Berners-Lee had established the basic tenet of his vision of the web, open sharing of information to allow faster and better development of information (O’Reilly, 2005). His vision will later be entangled in the discussion of whether Web 2.0 is actually a new concept, or simply a new term associated with a few new applications (Alexander, 2006).

In Berners-Lee’s book, *Weaving the Web*, (1999) he describes his original vision as a collaborative workspace, where in a ‘single, global information space’ everything was linked to everything (p.5).

### 1.2 Browsers

Berners-Lee’s browser was created on the NeXT platform, and quickly it became apparent that other browsers, running on other platforms would be necessary to make the new web available to more users (Berners-Lee, 1999; Anderson, 2007). Erwise, a collaboration of University of Helsinki students, was created for Unix machines, and Berners-Lee and his colleagues created a browser for Macintosh called Samba. Berners-Lee proposed in his book “Weaving the Web”, that it was just as important to edit the web as to browse it. In the current

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1 (Main contributors to the subject are O’Reilly, Alexander and Anderson.)
evolution of Web 2.0, Berners-Lee’s original ideas are beginning to take greater shape, possibly moving closer to what his original vision was for the web (Berners-Lee, 1999).

1.3 Marc Andreessen and Eric Bina

Marc Andreessen and Eric Bina created the first Internet browser adopted by the general public for the personal PC. In 1992, the two National Center for Supercomputing (NSCA) employees developed the Mosaic browser. Their new browser was much different than earlier browsers, which were very simplistic graphically, and mostly designed to work with Unix machines. Their new browser was designed to run on Unix, but soon after, PC and Mac versions would follow. One major breakthrough was the creation of the “image” tag, which allowed the inclusion of images on the web page, whereas before images were only viewable as separate files. For the first time, Mosaic made it possible for images and text to appear on the same page, which is one foundation for the popularity of the web today. One important creation incorporated in Mosaic included a graphical interface, using “clickable” buttons to navigate and scroll through text easily. Additionally, the creation of the hyperlink was very important, as before, in different browsers, links contained numerical references to documents. Now, hyperlinks allowed the user to simply click to be transported to the document. These very simple tasks, that are taken for granted today, were novel in 1992. Mosaic was tested on the NSCA computers in 1993, and it was immediately popular. Within weeks, tens of thousands of people had downloaded the software. This could be proposed as the first viral program on the Internet, long before the term ‘viral’ had been coined in this usage (Tracy, 2001).

With the addition of Mosaic versions for PC and Mac, the programs popularity skyrocketed. More users meant more content, which continued the spiral of more users, and more copies of Mosaic distributed. An article that appeared on the front page of the New York Times concluded with a statement about Mosaic, which said it was perhaps “an application program so different and so obviously useful that it can create a new industry from scratch”. How prophetic this article would be. The article never mentioned Andreessen or Bina (Battelle, J., 2005).
After completing his education at the University of Illinois, Andreessen moved to Silicon Valley in California. He soon met with Jim Clark, one of the founders of Silicon Graphics, and later discussions led to the creation of a startup company, Mosaic Communications Corp. The mandate of the company was to create a better product than the original Mosaic, and since the original Mosaic was built with university money, it belonged to the university, forcing the team to start from scratch, including a new name, NETSCAPE.

### 2.0 Netscape Browser

Pricing for the new Netscape product would be a key to its development, and the issue then would prove to be a model for the development of Web 2.0 today. Free usage vs. paid subscriptions was a difficult choice then (and is still a difficult choice today). All models used today, which generate revenue, are either free, paid or a hybrid, with premium offerings on top of free services, this has not changed since 1993. As will be examined in this work, many questions faced in 1993, at the beginning of Web 1.0 are just as relevant and complex today.

A comment from Andreessen explains the thought process for the introduction of Netscape:

“That was the way to get the company jump-started, because that just gives you essentially a broad platform to build off of. It’s basically a Microsoft lesson, right? If you get ubiquity, you have a lot of options, a lot of ways to benefit from that. You can get paid by the product you are ubiquitous on, but you can also get paid on projects that benefit as a result. One of the fundamental lessons is that market share now equals revenue later, and if you don’t have market share now, you are not going to have revenue later. Another fundamental lesson is that whoever gets the volume does win in the end. Just plain win.”

Examining this statement with the benefit of 14 years of hindsight reveals how correct in many ways the early pioneers were. The statement “market share now equals revenue later” is one of the fundamental arguments of the Web 2.0 buying spree occurring today. The first part of the statement “it’s basically a Microsoft lesson, right?” is being challenged today (Slive; Bernhardt, 1998, p.897, 898). Companies are shying away from the Microsoft model, which requires the use of physical software and un-editable collaborations for updates (Metrick, A., 2006; O’Reilly, 2005). Netscape would also come to find out that market share alone was not a guarantee of success, by 1996 Netscape controlled 75% of the browser market, and today it
is merely a subsidiary of AOL, which has fallen from grace in its own way (Cosumano and Yoffie, 1998). Microsoft’s Internet Explorer has long since replaced Netscape as the number one browser, mainly because it is included free with the Windows operating system (Davis; Murphy, 2000, p 184; Klein, B., 2001). Not all was lost for Netscape and its founders; in 1999 AOL bought Netscape Communications for $10 billion in stock. Today AOL does not use Netscape as its official browser. The Netscape story demonstrates the volatility of the Internet market and should not be forgotten in the evaluations of today’s high flying acquisition markets, especially in the area of social networking sites, which have a short history to draw from in reference to their fad factor and long term staying power (O’Malley, M. and Rosenzvig, R., 1997). Marc Andreessen is still actively involved in technology companies today (Klein, B., 2003).

### Figure 1

<table>
<thead>
<tr>
<th>Internet Browser Market Share – July 2007</th>
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<tbody>
<tr>
<td>78.84%</td>
</tr>
<tr>
<td>14.55%</td>
</tr>
<tr>
<td>4.49%</td>
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<tr>
<td>0.91%</td>
</tr>
<tr>
<td><strong>0.78%</strong></td>
</tr>
<tr>
<td>0.21%</td>
</tr>
<tr>
<td>0.22%</td>
</tr>
</tbody>
</table>

(Source – marketshare.hitslink.com – July 2007)

At the height of its market penetration, Netscape had over 85% of the browser market, today as is shown in a recent report of browser market shares, Netscape has less than 1% of the market.

### 3.0 The Web Today

The Web is changing in small increments. Everyday new applications are added, revised and tested by millions of users. Later in this paper, different methods for evaluating market values for startup tech companies are explored. As a primer for understanding the new and evolving technologies, a look into the changes that have and are taking place in the development of the Internet and the web will assist in later evaluations (Anderson, 2007).
One way to describe the current evolution is to look at the Internet in two phases, one before the NASDAQ collapse of 2001, and again after the collapse of the markets (Ofek, E.; Richardson, M., 2003). The financial wellbeing of an industry is not necessarily a good benchmark, but does provide a historical perspective to define two eras. During the fall of 2001, much of the industry came crashing down from the unrealistic expectations that were driving the unprecedented NASDAQ climb. Many Silicon Valley companies were being valued simply on smoke and mirrors, without solid evidence of even remotely profitable futures. As the market values came tumbling down, the Web 1.0 era came to a roaring halt from a financial investment perspective. The pretenders were ushered out the door and a few survivors remained, with Yahoo!, Amazon and eBay being the leaders in showing their strength, separating themselves from the rest. Financially, Web 2.0 is being defined by the lack of IPO’s in contrast to the Web 1.0 era. During the boom years at the end of Web 1.0, venture capitalist (VC’s) were bundling new IPO’s as fast as the retail market would swallow them up (Graham, 2007). Today, with the retail investor weary of Internet stocks, the play for VC’s has changed to one of acquisition, which will be explored later in this paper.

4.0 Enter WEB 2.0

The term WEB 2.0 (Web 2.0) can be traced to Dale Dougherty, Vice –President of O’Reilly Media, Inc. During a brainstorming session about a future conference, the participants argued that “far from having crashed” the web was more important than ever and innovative sites and ideas were popping up regularly (O’Reilly, 2005a, Graham, 2005). The crash had really just marked a turning point in the development, and the participants created a Web 2.0 conference concept (Graham, 2005, Anderson, 2007, O’Reilly, 2005). It is important to understand the term was not coined to simply capture the essence of new technologies, but as a more amorphous term. By September of 2005, the term Web 2.0 had taken hold and been cited 9.5 million times in Google. But, at that time, there was and still is a huge amount of uncertainty about what exactly Web 2.0 means (O’Reilly, 2005). Graham contends that the new term was not meant to suggest a new version of the web was occurring, but the point of the conference was to imply the web mattered again (Graham, 2005). Anderson points out that Web 2.0 should not held in opposition to Web 1.0, but rather should be seen as consequence of the full implementation of the original web (Anderson, 2007).
Brian Alexander, Director for Research at the National Institute for Technology and Liberal Education, argues that Web 2.0 is not really about a single new development, and suggests few people can agree even on the general outlines of what Web 2.0 is. Alexander (2006) offers that Web 2.0 may more aptly be a collection of heterogeneous mixes of emerging technologies. He proposes that Web 2.0 may be linked with the term, social software, an idea that dates back to the 1960’s. Social software of the past was defined by listservs, Usenet groups and web-based communities. The social software of today can be defined by blogs, wikis, trackback, podcasting, videoblogs and new models; such as MySpace and Facebook. In his writings, Alexander points out that wikis originally appeared in the late 1990’s, before the term Web 2.0 was coined, reinforcing his concept that Web 2.0 is evolving from earlier ideas, and is not a brand new idea.

Johnson provides another point of view for the Web 1.0 vs. Web 2.0 discussion. He notes, some revolutions are very abrupt, and clearly defined, such as LCD computer monitors vs. tube style monitors, where the difference is more clearly defined. For most Internet users, the first revolutionary moment was when they clicked their first hyperlink, a totally new experience, and truly a revolutionary event. He points out that other technological revolutions, such as email, took years to catch on. The current change in the structure of the web is a transformation, taking place in small steps by thousands of individual programmers, dozens of startups and a few software giants. He proposes that what is really taking place is a massive software upgrade for the whole web, which some are calling Web 2.0 (Johnson, 2005).

4.1 Key Web 2.0 Services and Applications

To understand the business models of the companies making headlines today it is appropriate to look at the technologies they are employing inside their applications. A brief explanation of several key terms and applications follows. Tech companies employing these web 2.0 ideas are being purchased by or merging with larger companies (Clemens, E., 2006).

Several services and applications are identifiable with Web 2.0. These services are built from the foundation of open sourcing on the web, they include, blogs, wikis, content syndication,
multimedia sharing services, podcasting and tagging services for content (Alexander, 2006; Anderson, 2007; O’Reilly, 2005).

### 4.1.1 Blogs

John Barger coined the term web-log or *blog* in 1997. A simple definition is a webpage consisting of brief paragraphs of opinion, ‘information, personal diary entries or links (posts), arranged chronologically, with the most recent first, in the style of an online journal’ (Doctorow, et al, 2002). Normally a blog will permit a reader to add a comment below the latest entry. Anderson (2007) comments that the key to a blog is it allows the reader to contribute as much as they consume. Blogging has become in many ways a signature item of social software. Part of the rise of popularity of blogs is the ability of Google to search them efficiently. Google has added a separate blog search site, blogsearch.google.com. As many thousands of new blogs and posts are added every hour, it takes a system like Google Search to make sure relevant posts can be found. Additional blog and RSS search services have appeared, which have made searching the blogosphere easier (Alexander, 2006).

To the benefit of bloggers that want their sites to be found, they can register for free with Technorati.com and their posts will be searchable by content and tags (see tags defined below).

Tagging each post with a key word or two (i.e. author-subject) allows the subject of the blog to be categorized, allowing for the system to later retrieve the blog via a standard menu system. Another term, called linking, is important in blogging as it allows for a deeper conversational nature for the blogosphere. By creating a permalink, the item can be retrieved later. Another key blogging technology is trackback. It allows blogger (A) to notify blogger (B) they have referenced their blog, creating interaction (Alexander 2006, Anderson 2007).

Blogging is currently available to most readers of online media sources, such as national news outlets and even local newspapers.

Of major importance to the growing blogosphere is the ability to receive only specific themed blogs, such as technology, or sports. An example of a niche specific blog is TechCrunch.com,
the leading blog on emerging technology companies. Niche blogs allow for control over the
users media reception, unleashing individuals from ties to stories only from mainstream
media (TechCrunch.com, 2007).

An interesting site for blogs is digg.com. The site is worth mention as it supports the idea of
social software, by allowing a more human interaction. Primarily targeted at technology
stories, users can vote for, or “digg” stories they like, and the site promotes the results based
on voting (Alexander, 2006).

4.1.2 Wikis

Another indication of Web 2.0 influence is the use of wikis, which is a web page or set of web
pages that can be easily edited by anyone who is allowed access (Ebersbach et al., 2005).
Wikipedia, an online encyclopedia is but one example of a wiki. The site embodies the
collaboration and trust empowered to the collective work implied in the term Web 2.0. The
online effort is open to all to view, criticize and edit (Wikipedia, 2007; Anderson, 2007).
Wikis are different in that they have history and rollback features so that previous editions can
be returned if the collective community does not approve of the editing. Wikis are good for
community working, because they are easy to change and correct (Ebersbach et al., 2006;
Lamb, 2004). Wikis are not without criticism, as the system allows for a great level of
openness, and in the past, Wikipedia itself has suffered from problems of malicious editing
(Stvilia et al., 2005, Cone, E., 2007, p 23). Alexander (2006) notes that wikis have been
around long before the Web 2.0 label was created, which would support the counter argument
that Web 2.0 is an evolution, not a revolution (Anderson, 2006). Stephen Laster, Chief
Information Officer at Harvard Business School, states one of his concerns with wikis is a
‘findability’ problem. So much is being published that it is difficult to find trusted sources. He
suggests that in 5 years there will be less wikis and blogs, and the ones that remain may be
more trusted, leaving it up to society to decide what is trusted and what is not (Levinson,
2007).
4.1.3 Tagging and Bookmarking

A tag is a keyword added to a digital object to describe it (Lastowka, F., 2000). Tagging is not a formal classification system. The lack of a formal system allowed Joshua Schacter to create one of the web’s most popular social bookmarking sites; del.icio.us. The site takes advantage of using tags, assigned by users (folksonomy) to attach key words to bookmarked pages. The bookmarks are collected in a web based server, and are available from any computer, not just the users personal PC. The tagged bookmarks are also available for sharing with other people with the same interests (Alexander, 2006; Anderson, 2007). One objective of del.icio.us is to promote the sharing of similar interests among users.

A look at the information about del.icio.us provides a look in to how the site works. The following description was taken directly from the del.icio.us website.

What is del.icio.us?

Information from Del.icio.us website:

*del.icio.us is a collection of favorites* - yours and everyone else's. You can use del.icio.us to:

- **Keep** links to your favorite articles, blogs, music, reviews, recipes, and more, and access them from any computer on the web.
- **Share** favorites with friends, family, coworkers, and the del.icio.us community.
- **Discover** new things. Everything on del.icio.us is someone's favorite -- they've already done the work of finding it. So del.icio.us is full of bookmarks about technology, entertainment, useful information, and more. Explore and enjoy.

*del.icio.us is a social bookmarking website* -- the primary use of del.icio.us is to store your bookmarks online, which allows you to access the same bookmarks from any computer and add bookmarks from anywhere, too. On del.icio.us, you can use tags to organize and remember your bookmarks, which is a much more flexible system than folders.

You can also use del.icio.us to see the interesting links that your friends and other people bookmark, and share links with them in return. You can even browse and search del.icio.us to discover the cool and useful bookmarks that everyone else has saved -- which is made easy with tags. *source - www.del.icio.us*
Tagging can go far beyond simple bookmarking and sharing of bookmarks. Examples of Web 2.0 companies employing tagging are Flickr.com, for photos and YouTube.com, for videos.

Tagging solves basic problems in the area of search, but the user is then required to search all of the tagged results, which can lead to an overwhelming amount of data. This is apparent when general searches for keywords such as “travel” are entered into search engines. A typical search can yield 1000’s of matching responses, which clearly demonstrates one of the pitfalls of tagging. As the database grows, tagging loses its designed efficiency as well.

4.1.4 Multimedia Sharing

One of the biggest growth areas on the web is multimedia-sharing sites; such as YouTube (video), Flickr (photos) and Odeo (podcasts). Users of these sites are allowed to create content, which embodies the writeable web theory, part of Web 2.0, where users are part of the production process. This idea differs greatly from early content suppliers, such as AOL, and even Yahoo! One key is the massive scale from which content can come, barriers to entry are very low, made possible by low cost digital media technology such as cameras, phones and video recorders (O’Reilly, 2005).

4.1.5 Audio Blogging and Podcasting

Podcasts are usually audio recordings of talks, interviews and lectures. Playback devises can be either a desktop PC or other MP3 devices. Podcasts were originally created in an effort to add audio streams to early blogs (Felix and Stolarz, 2006). Users make podcasts available via uploading to a host server, and then via RSS let the world know about their site. The process (known as enclosure) adds a URL, as well as directions to the file on a host server (Patterson, 2006).

4.1.6 RSS and Syndication

Websites, blogs and podcasts use the RSS system to notify subscribers of new content without requiring the user to go to the host website to search for updates. Information from the website is collected by a feed, using the RSS format, and sent to the user in a process known
as syndication. The user decides which feeds are important to receive updates from, then subscribes to the site, and then client software takes over, keeping the user informed about changes. RSS stands for Rich Site Summary (Doctorow, 2002). Later versions of RSS are also known as Really Simple Syndication (Anderson, 2007).

As the products and applications continue to develop, it is becoming difficult to keep up with the new entries. Sites such as TechCrunch.com provide news about startup companies and eConsultant’s Web 2.0 directory lists over 1200 services categories.

5.0 Seven Principals of Web 2.0

A paper authored in September 2005 by Tim O’Reilly, What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software, has laid the foundation for the discussion around Web 2.0. Many others have read the paper and either proposed additional ideas and concepts or taken disagreement with his outline of what Web 2.0 is about (Anderson, 2007). The basic premise behind the paper is O’Reilly’s list of seven principals of Web 2.0. Others do not totally agree with the simplicity of the seven principals presented as defining Web 2.0. (Carr, 2005; Anderson, 2007).

i. The Web as a platform
ii. Harnessing collective intelligence
iii. Data is the next “Intel Inside”
iv. End of the software release cycle
v. Lightweight programming models
vi. Software above the level of a single device
vii. Rich user experiences

Anderson proposes that O’Reilly identified features of successful Web 1.0 companies to use as a benchmark to determine if a company is Web 1.0 or Web 2.0. He further suggests that Web 2.0 is an umbrella term, encompassing many ideas. He also offers that Web 2.0 should not be compared or opposed to Web 1.0, but should be seen as a consequence of the web today being more fully implemented (Anderson, 2006). In contrast, O’Reilly identified sets of concepts that he used to identify Web 2.0 vs. 1.0.
In his paper, O’Reilly (2005) provides comparisons of several applications, which can help clarify several of the important points. A few examples can assist with the explanation. Each new service or application is an evolution of the earlier idea. O’Reilly proposed the following analogies:

<table>
<thead>
<tr>
<th>WEB 1.0</th>
<th>WEB 2.0</th>
</tr>
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<tbody>
<tr>
<td>DoubleClick</td>
<td>Google AdWords</td>
</tr>
<tr>
<td>Ofoto</td>
<td>Flickr</td>
</tr>
<tr>
<td>Akamai</td>
<td>Bit Torrent</td>
</tr>
<tr>
<td>Mp3.com</td>
<td>Napster</td>
</tr>
<tr>
<td>Britannica Online</td>
<td>Wikipedia</td>
</tr>
<tr>
<td>Personal Websites</td>
<td>Blogging</td>
</tr>
<tr>
<td>Evite</td>
<td>Upcoming.org and EVBD</td>
</tr>
<tr>
<td>Domain name speculation</td>
<td>Search engine optimization</td>
</tr>
<tr>
<td>Page views</td>
<td>Cost per click</td>
</tr>
<tr>
<td>Screen scraping</td>
<td>Web services</td>
</tr>
<tr>
<td>Publishing</td>
<td>Participation</td>
</tr>
<tr>
<td>Content management systems</td>
<td>Wikis</td>
</tr>
<tr>
<td>Directories (taxonomy)</td>
<td>Tagging (folksonomy)</td>
</tr>
<tr>
<td>Stickiness</td>
<td>Syndication</td>
</tr>
</tbody>
</table>

These examples reveal how the Internet has transformed itself from earlier services and applications, and how the latest developments are incorporating much greater user participation, a core requirement for inclusion into Web 2.0 theology.

The list of comparisons could be greatly expanded. What is important is to look at several ideals and attempt to distinguish between Web 1.0 and 2.0. Although there is not a hard, fast line between the two, there are significant differences worth exploring. Currently, many companies are jumping on the marketing bandwagon, claiming any new application, use or product is Web 2.0, and simply associating Web 2.0 as a buzzword.

One way to examine the web is to describe it as a platform, one without hard boundaries, but more of a theory, similar to a ‘sun at the center of the universe approach’.
Looking at the map above, it becomes clearer how the Web 2.0 might be broken into elements and principals that help to define and compare Web 2.0 to Web 1.0. The map highlights how Web 2.0, in theory, is much more interactive and open than Web 1.0.

5.1 The Web as a Platform

Viewing the web as a platform for delivering services is one of the premises of O’Reilly’s position. A new paradigm is taking place (Por Yu Cong, Hui Du, 2007). No longer will users need to have programs only on their PC’s, the services will be available via the browser window (Anderson, 2007; Klein, B., 2001). Graham (2005) contends that the idea of “the web as a platform”, which developed from the brainstorming, was a way to market the conference that was not to constricting.
An emergence of web-based services, which pull data from backend servers is occurring (Por Yu Cong, Hui Du, 2007). Ad hoc relationships between remote machines are freeing data that was once held by the gatekeepers. Virtual applications are becoming the norm, not the exception. New applications tend to be small, and deploy rapidly (Miller, 2005). A whole new generation of software is being developed, a wave that has not been seen since microcomputers first occurred. Microsoft sees the new wave and can do little to react, as it is coming to fast for them. Microsoft is currently in a battle with Google to buy as many new startups as possible, but Google has the lead at the moment (Graham, 2005).

Although the “web as a platform” may be a rallying cry of Web 2.0, Graham points out that delivering desktop applications over the web is as old as the web itself. The problem was in how it was delivered, via java applets, developed by Sun. The idea was to run java applets delivered from a server. He states Ajax is the next hot platform, and writes that thousands of hackers have suddenly started building things on top of it. Graham concludes his review of Web 2.0 by proposing that Google may be a true model. From his perspective, Google uses the Web, ‘as it was meant to be used’. Graham says, ‘Their sailing with the wind, instead of sitting becalmed praying for a business model, like the print media, or trying to tack upwind by suing their customers like the record labels.’

5.1.1 Google and Netscape

Assuming Netscape was the standard for Web 1.0, Google could certainly be the poster child for Web 2.0. Both companies IPO’s set the stage for new eras of the web (O’Reilly, 2005). Netscape viewed the web from the old paradigm, which viewed their web browser as a desktop application, and the strategy was to dominate the browser market, which would lead to a front running position in the high-priced server market. The concept of Web 1.0 was to
have power over the standards for controlling the display and applications in the browser. Netscape sought to use their “webtop” to replace the desktop of Microsoft. In reality, the idea was short lived as web browsers and servers quickly became commodity items (ibiblio.org, 2007).

Google has taken a different approach, using a native web application, a product that has never been sold or packaged. Their suites of offerings are simply services, where customers are paying either directly or indirectly for the service. They do not reply on physical software with scheduled updates, but in contrast provide a continuously updated product. One huge advantage is that there are not compatibility issues, their applications work with most operating systems.

One major difference that distinguishes Netscape from Google is that Google operates a database, which Netscape never required. Google is essentially a huge database, without which their application tools would be worthless. But, contrarily without their custom software, the data would be unmanageable. Another major difference is that software does not need to be distributed, only managed. Google does not produce a browser, or a server, but simply their service is delivered by the existing infrastructure of browsers and servers in place. In fact, Google does not even host the content users view and find, they simply facilitate the location of the information. They are the middleman between your PC and the host of the information you seek.

While it is true that both Netscape and Google can be called software companies, there is stark contrast in that Netscape can be compared to same software world as Lotus, Microsoft, SAP and Oracle. Google would more correctly be compared to companies of the likes of eBay, Amazon and Napster.

5.1.2 DoubleClick, Overture and AdWords

DoubleClick is a rare example of a Web 1.0 company using the web as a platform, by providing ad services as a web service. Early banner ad marketers, including DoubleClick were among the first users of what today is referred to as a “mashup” where two web services
are joined seamlessly. Banner ads were added to third party web sites, thus integrating three parties seamlessly. It is important to look at the early pioneers to compare where the use of the web platform has evolved and how today’s companies are taking solutions to a higher level. An examination of several cases will reveal the differences of Web 2.0 vs. Web 1.0.

DoubleClick provides advertisements to content providers, namely in the form of banner ads (Weinberg, J., 2000, ; Basho, K. 2000). Google recently purchased DoubleClick, a company that was built in the era of Web 1.0. DoubleClick successfully implemented the major banner ad programs associated with Web 1.0. The model for DoubleClick is interesting, in that it is specifically mentioned in the book, “The Search”, by David A. Vise and Mark Malseed (2005) as one of the defining factors in the creation of Google’s AdWords. Google founders, Larry Page and Sergey Brin, disliked the model for banner ads, in the sense that they were too brazen, and in technological terms, to slow too download. But yet today, their company owns DoubleClick. DoubleClick also does not take advantage of the long tail of advertisers, for which AdWords is famous, but in the past, only focused on the major media market. This recent purchase further blurs the lines of Web 1.0 vs. Web 2.0. As the quintessential 2.0 company, Google, has blended its technology with a Web 1.0 competitor (Battelle; Vise, 2005).

**Figure 3 – Google Press Release**

Q. What are the terms of the agreement?

A. $3.1 billion in cash. And DoubleClick will become a wholly-owned subsidiary of Google. Closing is subject to customary closing conditions, including requirements to get all necessary consents and approvals under applicable antitrust laws.
Q. How did Google come to the value of $3.1 billion?

A. We see this as bringing the worlds of search and display advertising together. We determined the value based upon the clear synergies between DoubleClick and Google advertisers, publishers, and ad agencies.


DoubleClick is a true Internet pioneer and a product of Web 1.0. Its main product is software, specifically banner advertising, and it works with data management (Weinberg, J., 2000; Basho, K., 2000). One limitation to DoubleClick, which is characteristic of Web 1.0, is the business model they have chosen. Their model of matching key ads with customers only extends to large customers, providing a base of approximately 2000 customers. Their premise in the 90’s was that the web was about publishing, not participation. This model followed the old school thinking that advertisers, not consumers should call the shots, and that the Internet was important for the top websites. What really was important in Web 1.0 was media scoring numbers, provided by companies such as MediaMetrix and others. A bold example of this model is that DoubleClick, on its website, promotes that over 2000 companies successfully implement their software. In contrast, Web 2.0 companies such as Yahoo! Search marketing (formerly Overture) and Google AdWords and AdSense serve hundreds of thousands of advertisers each.

The Yahoo! and Google school of thought is based on what is described by Battelle (2005) as “the long tail”, which implies that the real power of the Internet is the power of the collective small users, not just a handful of large companies. In reality, the small users make up the bulk of the Internet, and this is especially true today with the options and powers individuals have. Google and Yahoo! figured out how to avoid formal sales contracts, and created methods to put ads on virtually every website. And especially important to their model, was not pushing, and in fact supporting anti-banner web advertising. Both companies use simple text ads, which do not attempt to compete with the content. (Google now has banner ads)

Overture, developed by Bill Gross, was the predecessor to the idea of using simple text only ads, with key words related to the search performed. Overture was later purchased by Yahoo!.
Google would be accused of infringing on the Overture patent. Although the case never went to trial Google did pay Yahoo! damages. Overture was the original model for Google Adwords (Battelle, 2005).

An important lesson learned from Web 2.0 thinking is to make sure that customers can service themselves, and also to ensure data can be shared with the long tail, not just the head. eBay is a prime example of the long tail, by making a few dollars off of many users, vs. bigger revenue from a few clients.

5.1.3 Akamai and Bit Torrent

Akamai is a classic example of a business that concentrates on the head, not the tail. They specialize in movement of large data packets and heavy user demand environments. Their service relies on the use of massive servers of their own and their clients. By manipulating the data, they are able to move massive data streams and accommodate for huge traffic overloads of a single site. A recent example is their technology was used to distribute the live video stream for LiveEarth.org. concert (Akamai.com, 2007).

Bit Torrent is one of the early pioneers of the Peer-to-Peer (P2P) movement, which allows the Internet to be decentralized. P2P takes advantage of every user being a server, and allows clients to be served from many locations, which allows for multiple input points, and faster transfers of data. One result is that the more popular a download is, it creates more sources that are available, which decreases download time. This simple point is a key element of Web 2.0, the service should automatically get better when more people use it. This is in contrast to Akamai, which requires more servers to improve service. By creating an environment of participation, the servers act as brokers of information, allowing the edges to connect to each other (O’Reilly, 2005).

5.1.4 Collective Intelligence

According to O’Reilly (2005) one common trait of the survivors of Web 1.0 is that they have understood the power of embracing collective intelligence (Koopman, M, 1946; Warnock, R. 1943). One major foundation of the web is hyper-linking, which allows users to discover and
share new information on the web. Yahoo! was born as a collection of links, which started as a few thousand and evolved into millions, later focusing more on becoming a portal. Even as a portal Yahoo! knows the importance of its concentration of work as its core value. Graham (2005) refers to this collective intelligence as “Democracy”. He points out that in the world of news, many sources are letting the masses decide what stories are important.

In a paper written by Anderson (2007) he refers to a book titled “Wisdom of the Crowds” by author James Surowiecki. In the book, one main inference is that the collective knowledge of many is usually superior to few. Anderson cites an example of Cloudmark, a collective spam filtering system, which aggregates individual user decisions about what and what is not spam. He contends this human system can be superior to a machine based system. Graham posits that democracy of the net is being displayed by the quality of the material on the net, with numerous individual sites better than magazine articles or news stories. He observed many of the top sites in Reddit.com, a site that ranks stories by user interest, are linked to individuals sites, such as Michael Arrington’s TechCrunch.com (Graham, P., 2005).

eBay is another example of the power of the collective works of its users providing critical mass, which enhances usefulness and relevance. This mass also prohibits new entrants as well, whose offerings would be less attractive to users (Anderson, 2006, O’Reilly, 2005).

Comparing BarnesandNoble.com to Amazon, it is easy to see that they sell many of the same products, but Amazon has made as science of creating useful interactive relations with their customers. These interactions lead to more useful searches and additional selling opportunities as well. Amazon is not afraid to let users see the most relevant searches, even those that lead to products not directly under their control. Amazon has figured out that more interaction, or collecting intelligence, leads to greater sales (O’Reilly, 2005).

An additional example of Web 2.0 is Wikipedia, an online dictionary that is based on the concept that it is ok to allow users the opportunity to participate in the creation of definitions. A quote by Eric Raymond says, “With enough eyeballs, all bugs are shallow”. Not surprisingly, Wikipedia is one of the top 100 web sites and climbing quickly. This thinking represents a complete change in user content creation. Wikipedia has its critiques as well. In his article “ The amorality of Web 2.0”, Nicholas Carr criticizes Wikipedia, in what he refers to as the cult of the amateur. He agrees that Wikipedia represents many of the good ideals
behind Web 2.0, participation, collectivism, virtual communities and amateurism, but he extols that it is not accurate in many cases, and the information is slipshod, and less than professional. He contends that collective input does not equal intelligence. He opines that quantity of news is not a replacement for quality of news (Carr, 2005).

Blogging sites like del.icio.us and Flickr use a process called “folksonomy”, which is a style of collaboration, that allows sites to be found using “tags” which are based on looser protocols. Users are allowed to create their own tag words, and not limited to pre-selected categories.

One common trait many of the most successful Internet sites have is that they were created with word of mouth advertising, and relied on the power of viral marketing to take root. Web 2.0 sites tend to rely almost exclusively on word of mouth advertising, which is in contrast to Web 1.0, when huge marketing budgets were spent to create market share.

Many of the most productive web server tools are a collaboration of peer-production. Examples are Linux, MySQL, Apache and Perl.

5.1.5 Blogging

In Web 2.0 the power of collective intelligence is expanding and developing. The premise of search engines is to track and index new links, and blogs. With their huge amount of daily additions, they have a large role in shaping the results of search engines. Bloggers have a keen interest in the writings and posts of other bloggers, which leads to an “echo chamber effect” (Anderson, 2006).

Blogging has resemblances to Wikipedia, which is a model for collective intelligence. Blogging serves as a collection point for ideas, and filters out information quickly. Comments and posts are reviewed and questioned immediately, and sometimes harshly.

An important distinction about blogging is that although it may be seen as a direct threat to mainstream media, the real competition is from the blogosphere, the entire community of
bloggers as a whole to attract an audience. In this new media, the power to decide what stories are important lies in the hands of the people, not a few key media companies.

In Web 2.0, the era of the blog has evolved, with the medium on the rise (Owen, T., 2003). Much different than personal home pages, blogs have provided chronological order to the users information. By allowing structure to the commentary, it becomes collectively more useful, as well as easier to find and comment. A major breakthrough in the development of blogs can be traced to the creation of a technology called RSS. (RSS was born from Dave Winer’s: Really Simple Syndication technology, and originally from Netscape’s: Rich Site Summary- see definition of RSS below). Using RSS the user is notified when changes or additions are made to sites of relevance, which makes an RSS feed a much stronger link than a bookmark.

**Figure 4 – RSS Definition**

*Definition of a RSS format*

RSS is a format for syndicating news and the content of news-like sites, including major news sites like Wired, news-oriented community sites like Slashdot, and personal weblogs. But it’s not just for news. Pretty much anything that can be broken down into discrete items can be syndicated via RSS: the "recent changes" page of a wiki, a changelog of CVS checkins, even the revision history of a book. Once information about each item is in RSS format, an RSS-aware program can check the feed for changes and react to the changes in an appropriate way. [http://www.xml.com/pub/a/2002/12/18/dive-into-xml.html](http://www.xml.com/pub/a/2002/12/18/dive-into-xml.html)

RSS-aware programs called news aggregators are popular in the weblogging community. Many weblogs make content available in RSS. A news aggregator can help you keep up with all your favorite weblogs by checking their RSS feeds and displaying new items from each of them.

RSS is not only used for blogs, but also to provide all forms of data, from stock quotes to sports scores and weather. Web logs differ from other web pages in other ways as well. For the first time it became easy to simply link to specific posts on another users site and to discuss it. These innovations lead to greater discussion and chat.

The new blogosphere is the equivalent of the older bulletin board system used in Web 1.0. An additional feature that defines Web 2.0 is the ability to track-back to other people that have linked to their page.
5.1.6 The Power of the Database

A powerful database is at the center of the many successful Web 2.0 applications: Google and Yahoo's search engines, Amazon's product database, eBay's marketplace, and the iTunes music store are examples. Competency managing databases can be defined as trait of Web 2.0 enterprises.

Databases, and how they are managed, can define a Web 2.0 companies success. An example case is Mapquest, which was the leader in online mapping very early, beginning in 1995. Mapquest received its data from a third party supplier. Later, when Yahoo! Microsoft and Google added mapping functions, the same data available to MapQuest was available to these new entrants. MapQuest, in a very typical Web 1.0 way of thinking, did not add value to the data, by allowing users to add information to the database.

In contrast, Amazon used ISBN numbers from a third party supplier, and with the help of its huge customer base added relevant reviews to their database. Today the evolving database contains reviews from millions of customers, which makes an entry by latecomers into book selling much more difficult. Amazon has leveraged their position even stronger by using collective intelligence, a Web 2.0 trait of successful companies.

Google has taken a totally different approach to projects such as mapping. They allow the use of their mapping software to be combined with other programs to create what are known as "mashups", which are a combination of web applications. An example would be the combining of Google maps with real estate listings. Neither Google maps, nor the real estate listing alone would provide the combined effect of a mashup, containing a description and a mapped location of the property. The mashup is an example of Web 2.0 at work.

Many mashups begin life as project of hackers and techies, but later move on to become more traditional business models, either as add on products, or stand alone companies.
5.1.7 End of the Software Release Cycle

Web 2.0 companies are avoiding the release of software via set distribution cycles, and have embraced the perpetual beta idea. They are also using the web to host applications, and not requiring desktop applications. Web 2.0 software is always up-to-date. The discussion here is brief, as this topic is better explained in the section 6 on “The Microsoft Model”.

5.1.8 Software Above the Level of One Device

Web 2.0 companies are beyond designing applications and solutions for individual operating systems. New applications are web based and universal, with more concern about browser compatibility vs. OS compatibility. Many new apps are designed to work equally well on mobile devices.

5.1.9 Web 2.0 Follow up

After numerous articles, debates and blogs about Web 2.0, Tim O’Reilly decided to post his updated definition of Web 2.0 -

From O’Reilly -

- **Web 2.0 is the business revolution in the computer industry caused by the move to the Internet as platform, and an attempt to understand the rules for success on that new platform. Chief among those rules is: Build applications that harness network effects to get better, the more people use them**
  - (this is what he referred to earlier as “harnessing collective intelligence)

A comment by Eric Schmidt, CEO of Google, provides an even briefer formulation of the rule. Schmidt said, “Don’t fight the Internet” (O’Reilly, 2007).

The main point of this is to think about building systems that are free from the constraints of the PC era thinking. These thoughts are reminiscent of Tim Berners-Lee’s original thoughts, which implies Web 1.0 is one of the most “Web 2.0” systems out there, harnessing user contributions, network effects and collective intelligence. Schmidt added, the dot com bubble, Web 1.5, may have been caused by companies trying to fight the Internet, and losing.
Other rules of O’Reilly include:

- **Don't treat software as an artifact, but as a process of engagement with your users** - “The perpetual beta”
- **Open your data and services for re-use by others, and re-use the data and services of others whenever possible** - “Small pieces loosely joined”
- **Don’t think of applications that reside on either client or server, but build applications that reside in the space between devices** – “Software above the level of a single device”
- **Remember that in a network environment, open APIs and standard protocols win, but this doesn’t mean that the idea of competitive advantage goes away.**
- **Chief among the future sources of lock in and competitive advantage will be data, whether through increasing returns from user generated data (eBay, Amazon reviews, audioscrobbler info into last.fm, email/IM/phone traffic data as soon as someone who owns a lot of that data figures out that’s how to use it to enable social networking apps. GPS and other location data, through owning a namespace (Gracenote/CDDB, Network Solutions), or through proprietary file formats (Microsoft Office, iTunes).** (O’Reilly, T., 2006)

### 6.0 The Microsoft Model

The Microsoft (MS) model represents a model that is specific not only to the world’s largest software company, but is a reference to the practice of releasing software via physical discs and for unique operating systems, i.e., Windows or Macintosh personal computers. MS has dominated the software world since the 1980’s, mostly with their Windows Operating System (WOS). Windows, in its many variations, was and is primarily released through the sale and distribution of CD-DVD discs. The disks contain single versions of operating systems (OS), the OS is machine specific and not compatible with other platforms, virtually locking the user in one version, Mac or PC. This model has proven to be extremely successful, currently MS Windows products are used on approximately 90% of the world’s PC’s (eweek.com, 2007).

Paul Miller of Ariadne supports the idea that we are seeing much of the interoperability promise starting to arrive, with monolithic systems likely to be replaced (Miller, 2005).
What is changing for not only MS, but also all software companies is the model of software releases at all (Gurnani, H.; Karlapalem, K., 2001). Most new startups do not even consider requiring users to buy or use disks to import programs onto their PC’s. In the Web 2.0 world this would be the kiss of death to any new project. Internet users today, are becoming resistant to even downloading programs from the web. New technologies employed by YouTube, Flickr and others do not even require a flash plug-in, windows media player or real player download to work. The entire process is built into the application. Everything is web based, easy and fast to use. New standards are being set for the future. The use of the embedded Internet platforms spells death for most software applications requiring physical discs (O’Reilly, 2005; Gurnani and Karlapalem, 2001). Exceptions, of course, must be made for specialized programs and also for global locations limited to slow or mediocre Internet connections. MS will still retain markets for their OS products, but primarily through embedding at the manufacturers sites. O’Reilly adds that companies that succeed in the Web 2.0 era will be those that understand the game, in contrast to those who try to return to the rules of the PC era. Companies that seek to lock in applications are not playing to the strengths of the platform (Choudhary et al., 1997). He also reflects that Windows, which solved early problems with the PC, is a single monolithic solution, which is becoming the problem, and is no longer the solution (Miller, 2005).

In an article from Wharton Business School, Don Huesman, senior director of information technology at Wharton, suggests MS is investing heavily today to buy the company time to reinvent itself. MS had announced plans to spend $2 billion dollars in 2007 on new investments. Huesman continued by saying “The competition isn’t just Google. Sooner or later in the future, you won’t own software but have access to it (online)” (Huesman, 2006).

So apparent is the coming change in the model, that Microsoft CEO, Steve Ballmer acknowledged the MS core business could shift focus. Ballmer said, “Software really is evolving to be software and service as apposed to software as some kind of standalone entity”.

Eric Clemons, Wharton professor of operations and information management, says, “established companies have to think seriously about gambling to an extent that startups don’t. If a couple of college kids in a garage fail, they are out their time and their VC’s
money, while if they win, they win big time.” He continues, “This encourages risk-seeking behavior. If Microsoft, IBM or Apple fail, it’s visible and gets press coverage that the little guys don’t have to worry about.” Clemons suggests the solution is to buy breakthrough technology, not to invent it (Clemons, 2006).

Protecting the MS Windows franchise is the goal of MS today, and thus requires spending to protect the golden goose. As an example, in May of 2006, MS had a market capitalization of $236 billion. A startup firm with a market cap of $2 billion is considered a success. Should MS lose the value of its franchise Windows and Office products to competition, it would require over 100 newly acquired, and wildly successful startups to replace the equity that is at stake. This scenario is where a potential showdown with Google is developing, should Google be able to take share away from MS, they would begin to experience a slowdown in OEM OS sales, lost market share, margin compression and price pressures, all leading to a decrease in value of the MS franchise. At the present time MS is more about protecting the franchise than innovating.

An argument can be made in favor of MS’s future as well, in that compared to Google, which receives most of its revenue from search related activities, MS is more diverse. Technology can affect Google in a negative way just as easily as MS.

Raphael Amit, management professor at Wharton said, “What Google wants to do is strategically decrease peoples reliance on MS. It’s as simple as that” (Amit, R, 2005).

Huesman (2006) counters in MS’s defense and warns that the competitors should not take MS lightly. He uses an analogy of the US Civil War, where the South (like Google) was smaller and took on the plodding, but wealthier (Microsoft) in the North. “The South, led by the most brilliant generals of the day, dominated early with a series of amazing successes,” says Huesman. “Ultimately, however, the slower but stubborn forces of the north prevailed, due largely to their sheer size and wealth.” MS will not sit idly by without returning fire.

The end may be nearing for the days of software releases via a physical product (O’Reilly, 2005). MS set the mold for releasing software via strict launch dates. Web 2.0 software is a service, not just a product. The importance of offering ongoing support for the service becomes more important than the software. Users expect to be able to use the service “bug
free” and have short tolerances for failures. In contrast to past models, where MS was able to endure product operational glitches, Web 2.0 companies will not have this luxury. There are too many options available for users to remain loyal through many growing pains. Web 2.0 is about customer satisfaction.

Companies embracing Web 2.0 can benefit by allowing input from users, which act as beta testers for services. Treating users as co-developers, and following the doctrine of “release early and release often”, leads to what can be called perpetual “beta”. In contrast, releasing late, and rarely may be a recipe for failure. Recent Web 2.0 companies do not have the business models of the past to shed, and are much quicker to adopt current ideas.

A common belief in the computer business is that in the future that technology could establish a web-based platform that runs in the browser and is written in the language of the browser, vs. the language of the operating system. Re-enter Marc Andreessen (co-founder of browser company Netscape Communications), back in the mid 90’s, Andreessen made the comment that the web would reduce computer operating systems to the level of ‘poorly debugged sets of device drivers’ (Whitehouse, K., 2005).

O’Reilly proposes that a platform beats an application every time. An examination of Microsoft’s model will help explain his theory. MS, in earlier confrontations with rivals, played to its strength, the Windows platform. This allowed MS to compete and displace products such as Lotus 1-2-3 with Excel, WordPerfect with word and Netscape navigator with Internet Explorer. By controlling Windows, they had advantages.

Now, in the Web 2.0 environment, MS will have to compete at the platform level, a new platform with a much different business model. Microsoft’s current model holds to a massive installed base, with tightly integrated operating systems. On the other side, a system without an owner, linked by common protocols, open standards and cooperation agreements. The future competition is now more compelling as it pits platform against platform, and an individual company vs. the Web 2.0 community as a whole. MS may be forced to change their model (O’Reilly, 2005).
7.0 GOOGLE

To better understand the renewed exuberance in purchasing technology companies, we need to study Google, one of the main drivers of the new revolution taking place now.

A brief history of the creation and growth of Google will set the stage for future evaluations, and is therefore very important. Information about Google is obtained primarily from three sources, “The Search” by John Battelle, “The Google Story” by David Vise and Mark Malseed, and the research papers of Larry Page and Sergey Brin while at Stanford University.

Google owns and maintains the world’s largest computer system, which is actually a collection of over 200,000 individual PC’s combined to provide unimaginable computing power. Casual observers of Google’s search service simply see the results and imagine that their software is the main driver behind their success, but in reality, the hardware behind the scenes is equally impressive (Battelle; Vise, 2005).

The beginnings of the global search engine can be traced to the chance meeting of two Stanford University PhD students, Larry Page and Sergey Brin. The founders met in 1997. Larry Page was working on his thesis for his PhD, and began to investigate the form of the evolving Internet.

The name of the company is equally as chance happenstance as the meeting of the founders. The original idea was to name the company after the mathematical term googol, but because they could not spell, the name was registered as google.com. The logo was created by Brin, and is simplistic beautiful and recognized worldwide. In 1997 Google was available to students and faculty of Stanford. The university would prove to be an excellent beta site for the new program.

The basic quandary facing Page and Brin was the Internet was a growing compilation of unconnected information. Web pages were being created and added to the WWW. To make
order of the growing web pages, research began on what would later become the Google algorithm.

At the heart of the Google algorithm is the concept of PageRank, an idea created by Larry Page, and named after him. While examining the existing search methods, he noticed that search results were determined by the association, and number of occurrences of key words embedded in web pages. This method is ineffective for several reasons, most notably is that the number of occurrences of a search term did not always lead to the most relevant results. Simply embedding repeated key words into early web pages tricked search engines. The results often led to pornographic sites, which embedded key words in white text, on white backgrounds, which led to porno sites being the number one search result for many thousands of key search terms. The search system was basically unusable and ineffective. The current search results were based on quantity, not quality of key terms. This is the basic premise behind the creation of PageRank. PageRank uses a system of ranking not only the links a site is attached to (backrub), but also the relevance of the linking sites. Linking sites such as Yahoo, or AOL had more relevance that smaller traffic sites. The idea came from the concept of citations used for scholarly papers. With the idea being, not only do the number of citations mentioned matter, but the relevance of the citations. Additionally, the number of links each of those citations is attached to add relevance as well.

### 7.1 Google Architecture Overview

[Figure 5](#)
Excerpt from the original paper of Sergey Brin and Larry Page –

In this section, we will give a high level overview of how the whole system works as pictured in Figure 1. Further sections will discuss the applications and data structures not mentioned in this section. Most of Google is implemented in C or C++ for efficiency and can run in either Solaris or Linux. In Google, the web crawling (downloading of web pages) is done by several distributed crawlers. There is a URLserver that sends lists of URLs to be fetched to the crawlers. The web pages that are fetched are then sent to the storeserver. The storeserver then compresses and stores the web pages into a repository. Every web page has an associated ID number called a docID which is assigned whenever a new URL is parsed out of a web page. The indexing function is performed by the indexer and the sorter. The indexer performs a number of functions. It reads the repository, uncompressed the documents, and parses them. Each document is converted into a set of word occurrences called hits. The hits record the word, position in document, an approximation of font size, and capitalization. The indexer distributes these hits into a set of "barrels", creating a partially sorted forward index. The indexer performs another important function. It parses out all the links in every web page and stores important information about them in an anchors file. This file contains enough information to determine where each link points from and to, and the text of the link. The URLresolver reads the anchors file and converts relative URLs into absolute URLs and in turn into docIDs. It puts the anchor text into the forward index, associated with the docID that the anchor points to. It also generates a database of links which are pairs of docIDs. The links database is used to compute PageRanks for all the documents (Brin and Page, 1998).

The PageRank software was shopped to VC’s in Silicon Valley and with little success; nobody was interested in search as a standalone product. The main question was where is the revenue stream? Companies of the era were concentrating on selling ads. When offered to Yahoo!, one of the founders, David Filo, suggested that Larry and Sergey should start their own company, which would allow them to further develop their ideas. These famous words may someday come back to bite Mr. Filo.

In the spring of 1998, with the company in early stages, and email was sent to friends of Larry and Sergey’s, urging them to spread the word about Google. At this time the total Google index was 24 million pages.

In August 1998, with cash running very low for further development, an important meeting took place. Set up by graduate professor David Cheriton, the meeting was with Andy Bechtolsheim, a co-founder of Sun Microsystems. After listening to the demonstration, he expressed his concern that pure search companies, such as AltaVista, were bleeding money.
Bechtolsheim’s initial internal evaluation included the following mental keys.

- Did the idea solve real problems
- Was there potential to produce real profits
- Were the founders passionate and capable

He said, “This is the single best idea I have heard in years” and “I want to be part of it”. He was especially impressed with Larry and Sergey’s concern for spending money wisely, and not promoting large advertising and marketing budgets. He gave them a $100,000 check that day. Larry and Sergey celebrated by having dinner at Burger King. They had a check, but because they did not have corporation, it took two weeks to deposit the check and form a corporation. Bechtolsheim’s confidence in their idea allowed them to raise an additional $900,000 to purchase equipment and locate to new offices.

PageRank is the brains behind the Google algorithm, without the unique software, the answers provided by the Google search engine would not produce results in meaningful order. Producing useful searches, leads to producing useful advertising links, which promotes success for Google’s AdWords program. Accurate linkage of search results and associated text advertisements provide the huge revenue streams that Google receives today. It is “the long tail” effect at work (Vise; Malseed, 2005, Anderson, 2006).

| Search Engine Market Percentage as of July 2007 – marketshare.hitslink.com |
|---------------------------------|-----------------------------|
| 51.53%                          | Google                      |
| 12.12%                          | Yahoo                       |
| 9.51%                           | Google U.K.                 |
| 4.34%                           | MSN                         |
| 3.51%                           | Google AdSense              |
| 3.17%                           | Google Canada               |
| 15.72%                          | Others                      |

Google’s combined percentage share as of July, 2007 was 67.72%.
8.0 The Value of Blog Sites

What are blogs? Blogs are simply individuals’ thoughts about topics ranging from sports, to birds, to travel, to business and politics. A blog is simply a name for a web log, or in short, “blog”. Blogs have quickly become as important as any major network news department, as an avenue for news. The reliability of the source is purely a function of the readers’ belief in the content provided by the Blog owner, but what is most important is that incorrect facts are quickly challenged, and can be corrected immediately if wrong.

One of the most influential technology blogs is TechCrunch.com (TC) and is owned by its editor, Michael Arrington. Similar to the companies TC reports about, TC was started in 2005, as a part time endeavor, and has since grown to be the fourth most popular blog on the internet according to Technorati, an blog rating service (verified June 30, 2007). Monthly visitation is reported at over 5 million users, which makes TC a very influential player in the world of new technology.

The TC format is to post breaking stories in the technology world, with emphasis on new web based applications, programs and companies. Additionally, TC takes pride in having information of potential sales and mergers of tech companies. One recent blog post announced the sale of YouTube to Google for $1.5 billion, and TC is credited as being the first source for the story, beating the traditional major news organization with the scoop. This is one small example of how small media is changing the face of information distribution. No longer is media in control of only a few mighty companies, which speak to the masses (Newsweek, June 25, 2007).

What makes TC and other blogs unique, when compared to other online publications, is the fact that Arrington’s posts are quickly open to discussion, and if facts posted are incorrect, they will quickly be disputed by readers, this format is a very big change from the one sided reporting of major media. But, in traditional media things are changing as well, most major news outlets have adopted the blog and are allowing readers to post comments, and check facts that are posted.
As the importance of TC grows, the role of gatekeeper for new technology may be applicable. Because of the influence of his blog, Arrington can strongly sway the press startup companies will receive. Appearing in TC is a big milestone for start-ups (Newsweek, June 25, 2007, pg26). A mention for an upstart company in TC can lead to discovery by larger media outlets, which can lead to even greater exposure, which, if the news is positive, can influence funding from VC’s. TC must take care not too appear to biased in its support for new companies, and must remain neutral when reporting issues. A recent quote in Newsweek, says “When Arrington writes, Silicon Valley listens”.

In the same Newsweek article, it was reported that TC takes in approximately $100,000 per month in advertising revenue. Based on a simple model of estimated annual revenue of $1.2 million, it can be juxtaposed that with an acceptable five times multiple of revenue, that TC is today worth approximately $6,000,000. And further simple modeling would imply that with 465,000 subscribers (verified July 17, 2007 from TC site), each subscriber is worth approximately $10.75 (TechCrunch, 2007).

Technorati is a search engine for blogs. Using Technorati allows users to sift through the thousands of blogs, and locate only those that are of interest to the reader. Technorati is a major search site for blogs. With the ease of creation and availability of free hosting, the blogosphere is expanding rapidly. Technorati indexes over 75 million blogs (Wikipedia, http://en.wikipedia.org/wiki/Technorati), with approximately 50 million from MySpace alone. Looking at the sheer number of blogs, estimated at 75 million, it is easily understood that to stand out is difficult, which makes the impact and importance of TC extremely influential in a very crowded sea of blogs. Arrington’s TC is rated number four out of 75 million and is extremely important.

Feedburner.com is an aggregator of blogs and as of Sept 12, 2006, followed 242,062 publishers. On May 23, 2007 Google acquired Feedburner.com for $100 million. The total VC investment was $10 million.
9.0 Start up VC Valuations

To effectively attempt to place valuation on new technology companies, one must understand the jargon, techniques, methods and business models of the trade. In the preceding sections information was explored to explain the required background knowledge for examinations of values. Following are several techniques and methods used to evaluate technology startups.

Many technology companies are started in Silicon Valley. The city at the center of the action in Silicon Valley is San Jose, California. San Jose is home to many of biggest names in technology, such as Yahoo, Apple, eBay, Hewlett-Packard and Google.

Silicon Valley is also home to many of the worlds leading VC firms, which have been, and will continue to be the lifeblood of new development. Without VC money, many start-ups would never survive (Di Gregorio, D and Shane, S., 2000). The role of the VC is a double edge sword. The VC requires an ownership interest, and usually meaningful managerial input via a seat on the board of directors.

Gompers and Lerner (2000) offer that traditional finance theory implies that a firm is worth the value of its discounted future cash flows. If the investors learn the future risks will be lower, the value should increase. Similarly, if they learn the future profits will be higher, the value should increase. Both risk and future returns are related to the cost of capital. In VC funding rounds, the percentage of equity given up for funding depends on these, as well as other factors.

As discussed by Kaplan and Stromberg (2000) they found that VC firms look intensively at management and marketing team analysis, in contrast to explicit financial forecasts. In their study, they found only 20 of 42 companies included sales and earnings forecast for the new ventures.

VC’s are primarily about return on investment (ROI) and are not philanthropic organizations. The bottom line for them is what return will be achieved and in what timetable.
Because startups often have little or no proven revenue, the leap of faith required for a VC’s investment is huge. But, the returns can be beyond imagination. For example, the founders and VC’s behind successful startup YouTube, invested approximately 20 million and in less than 20 months received a return of 1.65 billion dollars from Google. Estimating their percentage of ownership at 30%, their return was 2475%.

Valuing returns on investments is easily obtained with simple mathematics. What is much more difficult is to analyze and value these young companies as they are being developed in the early stages. When companies go public, information about revenue and profit is disclosed, and traditional financial analysis can be performed.

VC’s provide early capital to young companies, and in exchange they require equity from the founders and management of the company. The early funding is referred to by different names as different levels of investment are funded. The first level may be the “Angel”, followed by the “A, B, C” rounds of capital investiture. To better understand these terms, and the consequences involved for the company owners, definitions of Pre-Money and Post-Money are given.

9.1 Definition –Post Money

Post-money valuation

A post-money valuation is a term used in private equity or venture capital, which refers to the valuation of a company or asset immediately after an investment or financing.

External investors, such as venture capitalists and angel investor, will use a pre-money valuation to determine how much equity to demand in return for their cash injection to an entrepreneur and his/her startup company. The implied post-money valuation is calculated as the dollar amount of investment divided by the equity stake gained in an investment.

If an investor make a $100 million investment in a company in return for 20% of the company’s equity, the implied post-money valuation is $500 million. To calculate the pre-money valuation, the amount of the investment is subtracted from the post-money valuation is $400 million (Wikipedia, Investopedia, 2007)
9.2 Definition – Pre Money

Pre-money valuation

A pre-money valuation is a term used in private equity or venture capital that refers to the valuation of a company or asset prior to an investment or financing.

External investors, such as venture capitalists and angel investors will use a pre-money valuation to determine how much equity to demand in return for their cash injection to an entrepreneur and his or her startup company (Wikipedia, Investopedia, 2007).

Example

For example, if an investor makes a $100 million investment into a company in return for 20% of the company’s equity, the implied post-money valuation is $500 million. To calculate the pre-money valuation, the amount of the investment is subtracted from the post-money valuation. In this case, the implied pre-money valuation is $400 million.

What is difference between Pre-Money and Post-Money?

They short answer to the question is that they differ in timing of valuation. Both pre-money and post-money are valuation measures of companies. Pre-money refers to a company’s value before it receives outside financing or the latest round of financing, while post-money refers to is value after it gets outside funds or its latest capital injection. If one is talking about pre-money valuation this refers to the value of the company not including external funding or the latest round of funding. Post-money valuation, then, includes outside financing or the latest injection. It is important to know which is being referred to as they critical concepts in valuation.

Example - Say an investor is looking to invest in a hi-tech startup. The entrepreneur and the investor both agree that the company is worth $1 million and the investor will put in $250,000.

The ownership percentages will depend on whether we are talking about a $1 million pre-money or post-money valuation. If the $1 million valuation is pre-money it means that the company is valued at $1 million before the investment and after investment will be valued at $1.25 million. If the $1 million valuation takes into consideration the $250,000 investment, it is referred to as pre-money.

<table>
<thead>
<tr>
<th>Pre-Money Valuation</th>
<th>Value</th>
<th>Percent</th>
<th>Post-Money Valuation</th>
<th>Percent</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneur</td>
<td>$1,000,000</td>
<td>80</td>
<td>Entrepreneur</td>
<td>75</td>
<td>$750,000</td>
</tr>
<tr>
<td>Investor</td>
<td>$250,000</td>
<td>20</td>
<td>Investor</td>
<td>25</td>
<td>$250,000</td>
</tr>
<tr>
<td>Total</td>
<td>$1,250,000</td>
<td>100</td>
<td>Total</td>
<td>100</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>
As you can see, the valuation method used can affect the ownership percentages in a big way. This is due to the amount of valued at $1 million it is worth more if the valuation is pre-money compared to post-money as pre-money does not include the $250,000 invested. While this ends up affecting the entrepreneur’s ownership by a small percentage of 5%, it can represent millions of dollars if the company goes public (Investopedia, 2007).

To illustrate, the difference between a 20% post-money and pre-money valuation in the case of Google would have been approximately a $100,000,000 million increase to the original owners/investors (Yahoo! Finance, 2007). This is based on the initial public offering price.

On June 27, 2007 the market capitalization of Google was listed as 121.821 billion dollars. Five percent of the recent market capital value is a 6.05 billion dollars difference (Yahoo! Finance, 2007). This affects the shares the owners still hold today.

**10.0 Purchases of Applications**

Writely.com is application for Google documents, which was bought for $15 million dollars. The value is solely based on what Google perceived to be an equivalent price. When applications are used internally, valuations of open market value are nearly impossible. This is because there is no revenue model and the application is simply an asset to be folded into a larger operation. If the application can stand-alone and generate revenue, then valuation will be much different. An example is jumpcut.com, owned by MiraVida Media, Inc. Started in September of 2005 with $1 million seed money, the company was sold to Yahoo! Six months after launch. Jumpcut.com is an online video-editing package. The mathematics of unique visitors, and page views is difficult when the property for sale is not a stand-alone company, but an application.

In 1999, Michael Mauboussin, the chief investment strategist at Credit Suisse First Boston, proposed a pattern for valuing Internet stocks. The technique did not compare Internet stocks to ordinary benchmarks, such as earnings, but instead compared Internet stocks only to one another. What he discovered was that in 1999, just 1% of 400 companies accounted for 40% of the $900 billion value of the sector. Scattering the companies resulted in a hockey stick pattern, with a few companies in the multiple billions and the rest close to zero. Mauboussin and his colleagues found that Internet companies have unique economics. Consumers on the Internet are overwhelmed with choices, and tend to gravitate towards well-known sites. The
implications are, as sites grow, they get bigger, attracting more users, which produces the winner take all outcome, as is seen in the hockey-stick model (Mauboussin, 1999).

10.1 YouTube Purchase by Google

In November 2006, Google purchased YouTube, a phenomenally successful online video sharing site, the site is currently experiencing 100,000,000 viewers each day.

According to the official press release by Google on October 9th, 2006, “YouTube is a consumer media company for people to watch and share original videos worldwide through a Web experience.” According to a case study by Thomas and Buch (2007), YouTube was the fastest growing website in Internet history, and also the most profitable growth in valuation of a company in less than 20 months. YouTube went from a valuation of zero to $1.65 billion in about 20 months, at which time it was sold to Google. YouTube was launched in February of 2005 (BBC.co.uk news 2006).

The beginning of YouTube is a classic Web 2.0 story, with three young Silicon Valley 20 somethings hanging out and chatting about a party they attended the night before. The group had taken some video and wanted to share the video with friends. The beginnings of YouTube were this simplistic, and later morphed in the fastest growing viral site on the Web. The domain was registered on February 15, 2005, and by May, the first Beta site was up. There were three original founders of the company, 29 year old Chad Hurley, 27 year old Steven Chen and Jawed Karim. All three are former Pay-Pal employees.

Although the site is credited with being a viral site, there is a bit more to the story. To entice new users, a contest was held, offering to give away one iPod Nano per day for two months. Participation was based on a point system, with points awarded for signing up, signing up friends and posting videos, which is an example of Web 2.0 viral marketing at work. By September of 2005, users were viewing videos more than 1 million times per day.

Dan Simmons, a reporter for the BBC news says in his July 14, 2006 post that YouTube attracts more viewers than MTV, a heavy weight established media company. He continues to
say that YouTube is the Internet's biggest talent contest. In the UK, recent research indicates that 1 in 5 viewers send video forward.

A look at one VC investor in the deal, Sequoia Capital, shows the potential profits from Web 2.0 startups, such as YouTube. Thomas and Buch (2007) say that Sequoia invested a total of $11.5 million over two financing rounds, and in return, received $495 million, a 43x return on investment in less than 2 years.

Was the valuation and price paid fair? The valuation depends on many factors, but using a pro-forma model, it would appear the price might prove to be fair, based on projected future revenues.

A report posted by the BBC.co.uk on July 17, 2007 confirmed that YouTube recently reached a milestone of 100 million viewed videos per day, with 2.5 billion videos viewed in the past month alone. According to YouTube company figures, the online video hosting company accounts for 60% of all videos watched online in the USA. YouTube also claims to have almost 20 million visitors to their site each month, with Nielsen/Netratings quoted as the source for the user statistic.

In contrast, MySpace has 19% share of the video market. And coming in a great distance behind are Yahoo!, MSN, Google and AOL, with about 3% each (source-hitwise).

A look at the 2006 Google Annual Report provides some details on the purchase price of the acquisition. The initial purchase price was $1,194,000,000, which all but $21,400,000 was paid in stock. Google issued 2,247,708 shares of common A stock valued at $1,173,000,000 and additional warrants to purchase 1,189,524 shares, valued at 546,500,000. The additional warrants are contingent on employment obligations of the YouTube founders. The details of the accounting are as follows:

| Goodwill                          | $1,134,687 |
| Patents & Development Technology  | $24,000    |
| Trade name, customer contracts & other | $153,000 |
| Net Liabilities Assumed           | ($45,027) |
Deferred Tax Liabilities  ($72,240)
Purchased in Process Research & Development  ------------

Total  $1,194,420,000

Examining the revenue for YouTube in 2005 and 2006, it is possible to see what valuations Google applied to the purchase of YouTube.

YouTube Financial Info

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$6,138,575</td>
<td>$10,617,810</td>
</tr>
<tr>
<td>Net Profit</td>
<td>$1,194,814</td>
<td>$2,801,942</td>
</tr>
<tr>
<td>Earnings Per Share</td>
<td>$4.04</td>
<td>$8.96</td>
</tr>
</tbody>
</table>

Looking at the revenues generated by YouTube prior to their purchase by Google, it can be determined that Google paid 628 times 2006 earnings ($1.76 billion value). How can this valuation make sense?

YouTube purchaser Google claims the web site is downloading 100 million videos per day. One revenue model proposed by Nova (2006) is that Google could receive about $15 cpm (cost per thousand) for each 10-second pre-roll ad in front of licensed content. The model assumes 20% of the YouTube content is not usable because of issues with copyrights or low quality. The model assumes 80 million videos per day are marketable. Approximately $440 million would be received annually with various costs to content providers of $290 million, leaving $150 million annual revenue (Nova, 2006). This would equate to a 10 x earnings multiple.

10.2 Photobucket Purchase

On May 8, 2007, Newscorps’ Interactive Media Division (parent company of MySpace) announced a separate deal to acquire the online photo sharing company Photobucket.com. According to Stephanie Kang of the Wall Street Journal, the deal is worth $250,000,000. Photobucket is an extremely popular and rapidly growing free Internet application. They key to the program is that it allows users to quickly build online photo and video galleries via the import of their files from their PC’s.
The service allows users to link content created on Photobucket with other Internet sites and blogs. The functionality and flexibility of Photobucket is one of the key reasons for the extremely high value to News corp. Photobucket obtains revenue from online advertising. It is one of the largest online photo communities on the web. In March 2007, Nielsen/Netratings reported the site attracted 14.2 million unique users. Strangely, the deal came shortly after a recent barring of all Photobucket images and videos on the MySpace web site. MySpace claimed to have blocked the content because the images and videos from Photobucket users contained advertising from 3rd parties. This is an ongoing concern and growing legal issue, not only for MySpace and Photobucket, but all companies involved with hosting and posting copyrighted material. The importance of the timing is that MySpace was in effect flexing its muscle, as if to show Photobucket who was actually holding the power. In reality, Photobucket had reverse leverage against MySpace.

In a May 7, 2007 article appearing on TechCrunch.com, editor Michael Arrington highlights why the Photobucket deal may have been a "steal" compared to Google's purchase of YouTube.com. The two companies have similar business models, both have user created libraries of videos, and both were catapulted to success on the back of integrating with MySpace. Photobucket has additional value as well, in that its site contains millions of photos, which assist in driving page view numbers and users. Looking at the numbers according to the Arrington article, Google paid $1.65 billion for YouTube, in an all-stock deal, and with final compensation coming in at $1.80 billion. News corp paid $250 million plus an earnout of $50 million more, or approximately 1/6 of the price Google paid.

When the YouTube deal was originally announced, YouTube had very little revenue (see notes from Google annual report). In contrast, Photobucket is on track to earn more than $25 million this year. Already, this deal is in the range of 10 – 12 times earnings, which is a very acceptable purchase price. Comparing the companies at the time of their purchases, YouTube had approximately 25 million U.S. monthly visitors (32 million global users), in May of 2007, Photobucket had approximately 20 million U.S. users, or about 80% of what the YouTube audience was when acquired. These figures were from Comscore, an Internet rating service.

As of May 2007, Photobucket had approximately 40 million registered users, and was on pace to add another estimated 85,000 per day. Without directly considering revenue, Arrington
suggests that Photobucket should have sold for about 4 times its actual selling price. YouTube was paid approximately $67 per unique visitor and Newscorp paid about $13. Did Newscorp make a fantastic deal or did Photobucket make a terrible deal (Arrington, 2006)? In analyzing the deal, it is important to consider that Photobucket is heavily dependent on the MySpace audience to share content created by its users, and earlier, MySpace had shown that it had the ability to block all Photobucket downloads. This ability to block PhotoBucket may have influenced the value of Photobucket to other buyers, forcing Photobucket to negotiate with Newscorp for the best offer.

The last minute tactic of Newscorp may be considered by some to be rough handed, or simply a brilliant move by the party with the upper hand. The approach used by Newscorp most likely reduced the price Photobucket received by driving away additional bidders. Either way, the ploy potentially saved Newscorp millions of dollars.

Even though MySpace provides the ability to create and load photos from within their own site, many prefer to have their files stored in third party sites. The reason is that photos and videos can be disbursed to many sites from one central location. Storing photos in one place vs. having to download into every site makes these sites valuable. And within the top ten sites for storing photos, it becomes increasingly important, because users will not wish to keep reloading duplicate photos into additional online storage sites. Thus, users in this category are very loyal and valuable. This is crucial in looking at the value of Photobucket.

Research was conducted using a sample of 1,201,651 valid MySpace pages. The results show that Photobucket had 68% of the market, associated with MySpace. The third place player, Tinypic, also owned by Photobucket, had about 4% of the market, together they have over 72% of the market. With this much penetration of the MySpace integration, the picture presents a double edge sword for both companies, MySpace could not afford to not allow Photobucket users access, and Photobucket could not afford to be blocked by MySpace.

James McQuivey, financial analyst for Forrester Research, thinks Newscorp did not overpay for the traffic. McQuiveys’ research estimates that one half to one quarter of the two companies users are overlap, and taking a worst case scenario, with MySpace gaining only half of Photobuckets 18 million monthly visitors, they would still gain about 9 million users, which equates to MySpace paying about $35 per new user. He is quoted as saying “That is a
very reasonable acquisition price” and “They can make that back through advertising sales without much trouble. But that’s not the reason you’d buy. You do it if there is some benefit that you can not offer the market unless you combine the two services.” (Sandoval, 2007)

With a purchase price for users at approximately $35 per user, this information can be compared to other sales in the social media arena.

In another article, posted by TechCrunch.com writer Paul Glazowski (TC May 8, 2007), he examines the finances of the deal in terms of what the total combined properties represent to Newscorp. In 2005 Newscorp purchased MySpace for $580 million and in 2007 added Photobucket for $300 million. Combined, the investment is $880 million for a duo of 60-70 million unique visitors each month, or approximately $14.67-12.57, compared to YouTube, which cost Google $1.8 billion (fully loaded cost) for 32 million viewers, approximately $56.25 per unique viewer. The audience of MySpace will help Photobucket grow, which will increase the value of the purchase.

In general this deal was good news for startups that have piggy backed onto MySpace, but additionally, a new benchmark may have been set as well.

Timeline of Events - Photobucket

- 2003, founded by Alex Welch and Darren Crystal.
- December 2005 – Nielsen/Netratings declares Photobucket the fastest growing site of the year
- July 2006 – Hitwise declares Photobucket the biggest photo sharing site, rating it at 43.84% of the market, with competitor Flickr at 5.95%
- September 2006 – Photobucket reports having 23 million users (conflicts with WSJ article of May 2007, WSJ states 14.2 million users in March)
- February 2007 – Photobucket launches a web-based photo and video editing re-mix service, followed by a video uploader with built-in webcam support, launched in March 2007
- March 2007 – Fortune magazine does a report that propels Photobucket into the stratosphere, claiming that the site is growing faster than Facebook, with 36 million users and 85,000 new users per day
• April 2007 – Love affair between MySpace and Photobucket seems to be at an end. MySpace blocks Photobucket videos, angering users. MySpace claims the problem is Photobucket’s advertisements are imbedded into the content, which is a violation of MySpaces’ user terms. A few days later MySpace lifts the block.
• May 2007 – rumors breakout MySpace is acquiring Photobucket

(Timeline from Mashable.com – Stan Schroeder)

10.3 Geni.com purchase

Geni.com is a very young Internet startup, whose niche is visually documenting a family’s genealogy. This is not a novel idea or an un-crowded field of competition. In the first round of Funding, Geni.com received $1.5 million, with a post money valuation of $10 million, and less than 7 weeks later, received and additional $10 million, based on a post money valuation of $100 million. At the time of this information’s release, Geni.com’s first round investors have theoretically made a 1000% return, 10 times their investment in 7 weeks. Geni.com had 100,000 users and 2,000,000 nodes attached to the 100,000 users. The valuation is totally theoretical, based on the beliefs of the investing VC’s.

In defense of the valuation, the company has plans to create a MySpace environment for the non-MySpace crowd, and family genealogy is certainly a strong starting link. But, as with other genealogy sites, after the tree is completed, what is the driving factor to return to the site day after day, which sites aimed at younger audiences can attract and hold page views. This valuation model would put FaceBook at $53 Billion dollars.

10.4 Rivals.com vs. Scout.com

In June 2007, TC reported that Rivals.com was purchased by Yahoo! for $100 million. At the time of the announcement Rivals had 2.5 million registered users, and 180,000 subscribers. Subscribers generate about $10 per month each, or about $21.6 million annually in Revenue. The sale was in the range of 5 x multiple of cash flow, an acceptable range. Registered user acquisition costs would be about $40 each.
In August 2005, Newscorp purchased Scout.com for $60 million. The company has approximately 200,000 subscribers, and 2 million unique users. Newscorp paid approximately $30 per unique user.

### 11.0 Business Valuations – Tech Companies

In a series of articles by Mark Cameron White, of the law firm White and Lee, LLP, he discusses several aspects of the many pitfalls and nuances of valuing start up companies. He discusses what the VC’s are looking at, and also what the management of the company should be considering as well.

For most startups, VC financing is both a gift and a curse. Should the venture be successful enough to warrant interest from the VC’s, this would indicate a level of belief in the concept, and a validation of the project. The current Web 2.0 environment is starting again to resemble the initial Silicon Valley boom. Some opinions in the industry say the enthusiasm is starting to take on the blind greed of the end of 2000 (Ofek, 2003), before the bursting of the bubble (Dilip and Brunnermeier, 2003). Other experts believe this time around, that investors will show more caution in their investment choices. Whichever school of thought is correct, certain valuation principals apply. Brian Karnofsky and Bruce Gomberg (2005), CPA’s with the firm Amper, Ploitzner & Mattia, support the observation of White, in that valuing technology companies is much different than traditional businesses. They say that factors typically present in traditional valuations are not present or provide very little insight into the technology company valuation. White (2005) notes that value is not solely about revenue, and compatible synergies have value as well.

White (2007) makes several recommendations and offers a guideline for determining the value of these startups. He states that setting valuations for growth companies and startups is extremely speculative, especially when in the earliest stages. When companies have a few years of earnings history, a comparison of similar companies at similar ages can be made, but when enterprises are in many cases less than 1 year old, with no history of sales or earnings, valuation methods must be changed. Aswath Damodaran (2005), uses the term relative valuation to explain one method of evaluation. He proposes that in relative valuation, the
value of an asset is compared to values the market assesses to comparable assets. Damodaran proposes the following guidelines for relative valuation.

- Identify and obtain comparable assets and the market values for these assets
- Convert market values to standardized values, because absolute values cannot be compared
- Compare standardized value of the asset being analyzed and the standardized value for the comparable asset, with controls for differences

For companies that derive their value from future growth, looking at variables other than current earnings and cash flow are more relevant (Damodaran, 2005).

Karnofsky and Gomberg (2005) support the observation of White, in that valuing technology companies is much different than traditional businesses. They say that factors typically present in traditional valuations are not present or provide very little insight into the technology company valuation. A lack of fixed assets is a pitfall in valuing new ventures, and in many cases, there is not even a product or prototype to view. Because many tech firms are first of their kind businesses, there may not be peer groups or benchmarks to compare to, which according to Damodaran (2005), is a method for evaluation. The ability to identify intangible assets, such as management strength, which may be the most important intangible asset, must be evaluated, and is more of an art form than an exact science (Karnofsky and Gomberg, 2005).

White’s position is that initially all company founders must recognize that the process is a negotiation between the buyer and seller. Valuations can not be set by simply plugging numbers into a spreadsheet, as is more feasible with mature industries and established benchmark numbers for sales and profit margins.

In the interest of company owners, many VC’s are willing to look beyond the deficiencies of the startup in exchange for early participation in the company. Because almost all valuation is based on future performance, traditional techniques, such as setting a low-end price limit of book value, are not realistic. Using the discounted cash flow method, which is commonly used for evaluations, is a possible method, if reasonable assumptions about future revenues
can be projected. Typically, revenues for 3-5 years would be estimated, with the total estimated revenue then discounted back to current value, taking into consideration the company’s risk adjusted cost of capital.

Venture Capital firms, which are representing their limited partners in venture funds, may use the following yardstick. One estimate is they are looking to multiply their investment 3 times in 5 years, which yields a ROI of 71%, or 10 times multiple in 5 years, an ROI of 58%. The following table demonstrates the ROI levels being pursued (White 2007).

TABLE ONE-Sample VC Discount Rates From Expected Payoffs

<table>
<thead>
<tr>
<th>PAYOFF</th>
<th>COMPOUND ANNUAL ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 times investment in 3 years</td>
<td>44%</td>
</tr>
<tr>
<td>5 times investment in 3 years</td>
<td>71%</td>
</tr>
<tr>
<td>7 times investment in 3 years</td>
<td>91%</td>
</tr>
<tr>
<td>4 times investment in 4 years</td>
<td>41%</td>
</tr>
<tr>
<td>3 times investment in 5 years</td>
<td>25%</td>
</tr>
<tr>
<td>5 times investment in 5 years</td>
<td>38%</td>
</tr>
<tr>
<td>7 times investment in 5 years</td>
<td>48%</td>
</tr>
<tr>
<td>10 times investment in 5 years</td>
<td>58%</td>
</tr>
</tbody>
</table>

SOURCE – White & Lee, LLP

Depending on the age of the company, ROI requirements may lessen with greater maturity (see The Venture Magazine Complete Guide to Venture Capital, Clinton Richardson, 1987, pps 183-184).

TABLE TWO: Sample VC ROI Expectations

<table>
<thead>
<tr>
<th>Company Stage</th>
<th>Compound Annual Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed or Startup</td>
<td>40% and up</td>
</tr>
<tr>
<td>First and Second Stage</td>
<td>30 to 50%</td>
</tr>
<tr>
<td>Third Stage and Mezzanine</td>
<td>20 to 30%</td>
</tr>
</tbody>
</table>

*Note: These figures are for ROI, not percentage of ownership of company
White (2007) states that sophisticated investors, including VC’s, institutional investors and corporate investors, start the process of examination by looking at cash flow, then move forward to test assumptions and various business models.

11.1 Methods of Valuation

There are three methods suggested by White and Lee (2007). The first method is called the Hockey Stick Method. The investor must choose from three variables, (a) what ROI is sought through the investment period, (b) applies a price earnings ratio at the end of the projection period to determine the market valuation of the company, and (c) then determines percentage ownership as the ratio of the investor’s expected ROI to the market valuation for the company as a whole. The formula for the hockey stick method consists of the following:

\[
\frac{\text{(initial investment) x (expected payoff)}}{\text{(after tax earnings) x (comparable P/E)}} = \text{Percentage}
\]

For ownership

To apply the method, assume (a) the Company requires and investment of $800,000, (b) the projection/liquidity period is 3 years, (c) the investor expects to earn 5 times its investment over a 3 year liquidity period, (d) the Company’s 3rd year after-tax earnings are expected to be $1 million, and (e) an appropriate P/E ratio based on a composite of comparable stocks is 12. By applying the formula above, the investor will ask for approximately 33% of the company—or whatever higher percentage the investor is able to coax out management, as follows:

\[
\frac{\text{($800,000 investment) x (payoff of 5 times)}}{\text{(1 million) x (12)}} = 33%
\]

For investor
The hockey stick analogy for this method comes from the graphical depiction of typically no earnings for the early months or years of the Company, followed by steadily rising earnings growth.

2. The conventional VC Method. This method is identical to the Hockey Stick Method, with the exception that the future market valuation of the Company is discounted to the present before the investor percentage of ownership is determined. To illustrate how the Conventional Method works, consider the example of the Company described under the Hockey Stick method above. Under the Conventional Method, the following steps would be followed:

   **Step One:** The 3rd year after tax earnings of $1 million is multiplied by the accepted P/E ratio of 12 for a market valuation of $12 million

   **Step Two:** The market valuation achieved over 3 years is then discounted to its present value of $2,400,000, using a discount rate of 71% (which is the rate resulting from a desired payoff of 5 times investment over 3 years).

   **Step Three:** The investor’s ownership in the company is determined by taking the initial investment of $800,000 as a percentage of the $2,400,000 present value of the Company – which equal 33%. This is the same equity ownership derived under the Hockey Stick Method.

3. The First Chicago Method. Similar to “decision-tree analysis” where decisions are analyzed based on the probability of certain events occurring – the First Chicago Method values the company based on the cumulative impact of the probability of different earning scenarios. While different scenarios can be generated under either the DCF, Hockey Stick or Conventional Methods – the First Chicago Method requires management and the investors to consider the likelihood of earnings scenarios, thereby accounting for a range of possible outcomes in a single analysis.

   To illustrate the First Chicago Method, consider the following example (assuming initial revenue is $2.0mm):
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue Growth</strong></td>
<td>60%</td>
<td>15%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Revenue over 5 years</strong></td>
<td>$20.97mm</td>
<td>$4.02</td>
<td>$2.0mm</td>
</tr>
<tr>
<td><strong>Earnings</strong></td>
<td>$3.15 million</td>
<td>$0.28mm at 7%</td>
<td>$0.14mm at 7%</td>
</tr>
<tr>
<td><strong>P/E Ratio</strong></td>
<td>17</td>
<td>7</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Mkt value</strong></td>
<td>$53.55mm</td>
<td>$1.96</td>
<td>$0.5mm(liq)</td>
</tr>
<tr>
<td><strong>Present Value at 40%</strong></td>
<td>$9.96mm</td>
<td>$0.364mm</td>
<td>$0.092mm</td>
</tr>
</tbody>
</table>

**Discount rate**

<table>
<thead>
<tr>
<th>Probability</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected Present Value</strong></td>
<td>$3.98mm</td>
<td>$0.146mm</td>
<td>$0.0184</td>
</tr>
<tr>
<td><strong>Cumulative Pres Value</strong></td>
<td>-------</td>
<td>$4.144mm</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Percentage Ownership w/</strong></td>
<td>-------</td>
<td>approx. 48%</td>
<td>-------</td>
</tr>
<tr>
<td><strong>$2.0mm initial investment</strong></td>
<td>-------</td>
<td>ownership</td>
<td>-------</td>
</tr>
</tbody>
</table>

The management of the company must question the valuations of the investor, as normally, the trend will be towards valuing the lowest possible price in order to achieve the greatest ownership for their investment. Alternatively, investors must question the numbers presented by management, as the reverse will be true, with management seeking the highest possible valuation (Luehrman, T., 1997, p132).

This topic gets very important in situations where an entrepreneur has a good idea but few assets. In such a case it's very hard to determine what the company is actually worth. More than anything, the valuation becomes a subject of negotiation between the entrepreneur and the investor (Investorpedi.a, 2007).

Several important considerations to review by both parties are:

1. **P/E ratio of the company** - higher ratios reduce the cost of company funding
2. **Expected ROI** - is the ROI in line with other similar investments
3. **Earnings Projections** -management can expect lower valuations from investors
4. **Projection Period** – Expected payout date, via IPO or acquisition
5. **Downside Risk** – What does the investor perceive as the downside risk
The potential most important factor in the early evaluation process is the investors’ comfort level with the management of the company and the belief the company will succeed.

With all the known difficulties of evaluating tech companies, it is interesting to look backward into the tech craze of 2000. Companies such as eBay, Amazon, and America Online were trading at multiples that had never been heard of before. In February of 2000, eBay.com was trading at a P/E of 1600 (Yahoo!Finance, 2007), and Amazon.com was trading at a minus 237 times earnings (motleyfool.com, 2000). Mann (2000) implied the same basic story of today’s valuations; which is there is no way to know who will survive and who will not. Mann suggests that in the absence of DCF, which will not help investors when there is little or negative cash flow, there are other ways to evaluate.

eBay.com, which was one of the focus companies of an February 2000 Motleyfool.com article, provides a good look at what are the unknowns of investing and valuing Internet and tech companies (Venkatraman, N., 2000, p 15). According to Yahoo!Finance (July 8, 2007), the adjusted stock price of a one share of eBay is $33.39 per share. Looking at the data, the historical price adjusted for splits, results in an offering price of $1.88 per share. eBay.com provided a tidy return of 1,776% in less than 10 years. The current P/E ratio is 37.40, and the market capitalization is 45.54 billion dollars. Comparing the P/E ratio of February, 2000, which was 1600, it is clear that high early P/E’s, which normally ward off investors, can be used as a potential benchmark, assuming other factors, such as industry and product offering are similar (Damodaran 2005).

In another article, Wolf (2000) implies that during the year 2000, the market was in a state of great price imbalance. In July 2000, the market as a whole stood at 30 times earnings, a number that is too high. Looking ahead to 2007, the market for tech firms is starting to exhibit similar characteristics. One of Wolf’s implications is that firms may be experiencing success in the general market, and prices for stocks, specifically tech stocks, could be much higher than common sense should dictate, a case of over exuberance can occur.

The second implication Wolf makes is that all bubbles in the past US history have burst, and that it is possible, the current rush to purchase technology, may again be a bursting bubble waiting to happen.
In 2001, Wells examined the issue of Business Method Patents, specifically as related to Internet and technology companies. One example of a caution area for tech buyers is outlined with the example of Amazon and Barnes and Noble.

Amazon.com received a patent for one click check out, a simple process that allowed registered users the opportunity to simply select a button, which allowed their previous account information to be used for the new purchase. Barnes and Noble used a similar one step process, until ordered by a court to stop. To comply with the court order, Barnes and Noble simply added a layer to the process, requiring two clicks. The one click system was called the “Express Lane” shopping system. The timing was the eve of the Christmas shopping season. Amazon’s use of their patent created a controversy in the industry.

The uproar was about an implied implicit industry norm, that Internet patents should be used defensively, not offensively.

Regarding valuation, it should be concluded that companies that possess unique business ideas, may own patents that are not accepted within Internet norms. Although Internet norms are certainly subjective, there appears to be a pattern of acceptable practices. The relevance for asset pricing would not simply be constrained to the patent itself, but also the acceptability of the industry to the patent, thus, method patents, must receive careful examination when considering investment or purchase of technology companies.

The concept of patenting Internet business methods flies against the early Internet pioneers ideas of the sharing of ideas and information, this feeling was echoed in an open letter to Amazon CEO Jeff Bezos, by Tim O’Reilly. An excerpt of a portion of that letter follows:

“ I also want to say that a patent on something like “1-Click ordering” is a slap in the face of Tim Berners-Lee and all of the other pioneers who created the opportunity that Amazon has done such a good job of exploiting. Amazon wouldn’t have existed without the generosity of people like Tim, who made legitimate, far-reaching inventions, and put them out into the public domain for all to build upon. Anyone who puts a small gloss on this fundamental technology, call it proprietary, and then tries to keep others from building further on it, is a
thief. The gift was given to all of us, and anyone who tries to make it their own is stealing our patrimony”.

These are very harsh words from a respected industry veteran. This open statement highlights how quickly and publicly any objections to Internet practices can be made public. Most importantly, due diligence for pricing should include the current affairs of a company's intellectual property.

On the flip side, certainly Amazon.com and others who hold the controversial patents have the right to defend them, and to use them in the most effective possible light.

In looking at valuation models, it is important to see how the products of the Internet have changed. One Internet industry technique used early on was deriving revenue from users' connection time online. Looking at the past model, the income stream was from the connection time users required. AOL, one of the first Internet Service Providers (ISP’s), began their service by charging for each minute of connection time. As the use of broadband connections and other competitors' services emerged, their model became obsolete. In reference to the models proposed by White and Damodaran, the models used for evaluation did not survive the timeline used, one of the many pitfalls of trying to evaluate fast growth tech companies. With changes in the model, AOL placed emphasis on volume of traffic, and number of eyeballs presented, long standing advertising pricing mechanisms.

Because cost per thousands (CPM’s) were not established, using the method of comparison, as proposed by Damodaran for revenue streams was not possible, as AOL and others were pioneers in this field. New measurement techniques were developed for counting banner ads, hits, page views and unique users, the benchmarks of valuations used today.

A few additional methods are introduced and explained by Kraimer (2005). He proposes the following methods for valuing Internet and web related businesses.

First offered is the Revenue Multiple Method, which simply takes the current revenue and multiplies it by an X factor, say, 2-5 times earnings, with web sites generating over 100,000 often fetching 10 times earnings.
Second, the Assumed Revenue Multiple Method can be used. Web site traffic and or ranking analysis can be used to establish a value. Depending on the availability of web site statistics, an analysis of keywords the web site is receiving traffic on can be created. The key factors are the number of times key words are searched for. The data can be compared to Google and Yahoo to see how much the advertisement would generate in revenue.

For example: If a web site receives 101 hits per month from Google for the keywords “San Diego Car Rental”, and Google charges $2.50 per click, the site is worth at least $3,030/year (101 x $2.50 = $252.50 x 12). Using a 5x multiple, the site would be worth at least $15,000.

Additional methods can be applied based on generic search results as well. Assuming a key word is the first “Generic” result in Google, and we know the term is used 300 times throughout all search engines in a given period. In this example, use 300 times per day as the total number of search results in a day. Recent history indicates that Google receives about 56% of all searches, and searchers in Google will select the first “Generic” search result in about 60% of all cases in Google, the result will be about 101 hits per day. Or more simply, Search Engine Referrals = The number of searches * Percentage captured through various search engines.

One more method is the User or Subscriber Method. The foundation for the method is to use the number of subscribers as a multiple for earnings. Common numbers used for “Business” subscribers are $10-15 per subscriber, but this is only for “Business Subscribers” vs. individual subscribers. Individual subscribers are normally valued at $0.10- $1.00 for quantities below 100,000 users and $2-5 for subscriber bases over 100,000. For subscriber bases over 1,000,000, valuations can grow exponentially.

One final method suggested is the Recreating Cost Method, which is used more often when the subscribers, and or web traffic is low and there is little or no revenue. The value is based only on the inventory and assets, similar to a traditional bricks and mortar method. Kraimer also offers what he calls ‘eyeball valuation’.
Eyeball valuation is simply as implied, the number of people looking at a web site. It is another technique used to evaluate Internet company valuations.

Looking at a few recent purchases; The New York Times buys About.com for $140 million, Interactive Corporation buys AskJeeves for $1.85 billion, News Corps bought MySpace for $580 million, and Google bought YouTube for $1.85 billion. Using these numbers as a base, the value of ‘eyeballs’ or unique monthly visitors per-month, is approaching $50 per set. Every set of purchases is unique, but these averages do hold.

Later the revenue model changed again from one of focusing on eyeballs and content to e-commerce. Amazon.com lead the e-commerce revolution, a poster child for Web 1.0 companies of the era. Selling products was the new model, but Amazon and others, sold products at below cost to attract users. Today, new ventures are using the same ideas, selling or providing services at losses, or with minimal revenue, to attract users, which will equate to revenue in the future. The importance of this analogy is that techniques used in Web 1.0 are being used today, which leads to the blurring of a true break from Web 1.0 to the Web 2.0 label of today.

12.0 Conclusion

As we have seen there is some evidence for a Web 2.0 evolution taking shape. The Web of today has it roots firmly in the foundations presented by Tim Berners-Lee and his original ideas for what the Web should be in the future. The path to today has not been with out perils, both financially and morally. The Internet we use today barely resembles the previous versions from the early 1990’s. The web has evolved from a lack of content into an overload of information. It has also become for many their most important source of social interaction. Using wikis, blogs, and social networks, we have become absorbed by the web. The marvelous applications are coming rapidly, created by a new breed of developers, not only by VC’s and Wall Street suits. The applications are coming from a more practical side, and less from capitalistic ambition. The new Web 2.0 is about sharing information, and interaction among the masses. When social network sites, such a MySpace and Facebook can command a greater audience than MTV, we are assured the landscape has changed. A single phrase to describe the frontier is openness of everything… conversations, images, videos, software,
marketing to the masses. The control has been taken back from the few and given back to the many. Berners-Lee’s visions are coming full circle.

Although the applications may look new, they are deeply imbedded in the history of Web 1.0. If the beginning can correctly be called 1.0, then today we are at 1.1. It is too early to say the Internet is at phase 2.0. The change is too abrupt to reflect the realities, which are all things with the web essentially evolve from earlier ideas. Today’s changes are coming quicker for sure, with advancements in the tools of the developers, their chains are being released to design useful and helpful applications, and as a society with an appetite for innovation, we devour it wholeheartedly. We do not reflect on the efforts of the past, we simply assume that things will continue to change rapidly, and continue to delight us.

But still, many of the business models of today remain unchanged, as the business of the web requires great leaps of faith, and does not fit the traditional models of other industries, VC’s are often in the dark about future returns, which keeps the required returns very high, as failures bring down the averages. For every YouTube the there may be a 50 LoseTubes as well. The markets are as uncertain as in the Web 1.0 era for sure.

There are several limitations for the research of this topic. Primarily, the Web 2.0 school of thought is new, and journal articles are few. More research needs to be done in exploring Web 2.0 and the links to the past. A great amount of excitement and works were written during the era of the dot com mania, but the new material is severely shallow. Additionally, to research financial transactions of the current era, one needs the latest tracking numbers for each web site, and unfortunately the companies with the information are very Web 1.0 oriented, and the information requires subscriptions to the data.

Business models for evaluation will continue to be challenging, as they have been in the past and will continue to be in the future. Potential buyers will be the limited few to really understand and study the inside information, and must accordingly rely of the accuracy of the information presented. Non-listed companies present special challenges and potentially great rewards.
By presenting a background for the current state of the so-called Web 2.0 revolution, buyers will be better informed and hopefully make better buying decisions based on the methods available.

Yes, there is a great change from the 1990’s, and the market is evolving with rapidly changing dynamics. “We hope to have provided in this work a picture of the current state, and tensions of this promising industry.

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Abbreviations

AOL - America Online
CPM – Cost Per Thousand
DCF – Discounted Cash Flow
HTTP Language – Hypertext Markup Language
IPO – Initial Public Offering
LCD – Liquid Crystal Display
OS – Operating System
MS – Microsoft
OEM – Original Equipment Manufacturer
P2P – Peer To Peer
ROI – Return On Investment
RSS – Real Simple Syndication
TC – Tech Crunch
URL – Universal Resource Locator
VC – Venture Capitalist
WWW – World Wide Web
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