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Uses and adoption of Web 2.0 : a study of the next generation of the Internet

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USES AND ADOPTION OF WEB 2.0:

A STUDY OF THE NEXT GENERATION OF THE INTERNET

A Thesis

Presented to

The Faculty of the School of Journalism and Mass Communications

San José State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

by

Caitlin Rives

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by
Caitlin Rives

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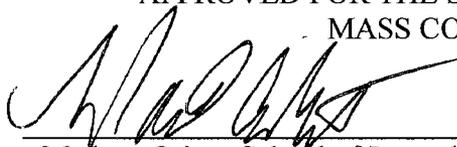
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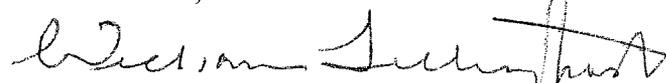
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ABSTRACT

USES AND ADOPTION OF WEB 2.0:
A STUDY OF THE NEXT GENERATION OF THE INTERNET

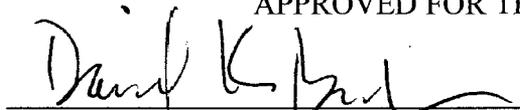by Caitlin Rives

This thesis examines the uses and adoption of Web 2.0 technologies using a

theoretical framework of uses and gratifications theory and diffusion of innovations

theory. It examines the uses and gratifications of Web 2.0 technologies and how those

compare to the uses and gratifications of the Internet. In addition, it addresses the

connection between uses and perceived ease of use and levels of adoption. Using a

modified replication of a study conducted by Stafford, Stafford, and Schkade

(2004) to determine the uses and gratifications of the Internet, this study examined

the uses and gratifications of Web 2.0 technologies and the levels of adoption and

ease of use for six Web 2.0 technologies.

This study found that the uses of Web 2.0 technologies are similar to those

identified as uses of the Internet in the original study but with additional use terms that

reflect the social and user-oriented nature of these new types of technologies. This

study also found that the length and frequency of use of Web 2.0 technologies were

positively correlated with the uses identified and perceived ease of use.

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CHAPTER 1

INTRODUCTION

Web 2.0 is a term popularized by O'Reilly Media and Media Live

International in October 2004 after it was brought up in a brainstorming session. It

has since grown to mean a second phase of the architecture and application

development for the Internet (YouTube Video, Web 2.0). There are many

definitions for the term, but the essence of all of them is that it is a new generation

of the Internet with the Web as the platform and a new way that users use the

Internet. It consists of user-generated, controlled, and organized content. Web 2.0

is all about the users and their contributions to the richness of online content. Web

2.0 technologies are seen in blogs, wikis, social networking sites, video and image

sharing, tagging, RSS subscriptions, and many other applications that promote

users' ownership of content. As a comparison, Web 1.0 applications and sites were

limited to only the content that was currently on the page and controlled only by the

Web administrator (wikipedia). Web 2.0 is harnessing many applications and

technologies that were already in existence but bringing them to an interface that is

enhanced by users.

The purpose of this study is to explore the uses and gratifications of new

media focused on Web 2.0 technologies and explore the relationship of uses with

rates of adoption. Web 2.0 can encompass so many new technologies that, for the

purpose of this study, the researcher will focus attention on social networking sites,

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blogs, wikis, and video, audio, and image sharing. These features have been chosen because they are the most popular forms of Web 2.0.

Today's social networking sites such as MySpace or Facebook allow users to find an interact with others in a virtual environment. Blogs are personal diaries posted to the Web for others to read and comment on. Unlike Web sites of the past, Wikipedia is a forum where users can not only find information but update it as well. With Web sites like YouTube and Flickr, sharing images and videos is as simple as uploading them to the Web. The common characteristics of all of these sites and technologies are the users and their ability to directly affect the content.

This study is conducted within a theoretical framework of uses and gratifications theory and diffusion of innovations theory. Extensive literature is available around these theories and the Internet. This study attempts to make connections from the research conducted on uses and adoption of the first phase of the Internet and apply it to this new phase. This will be a modified replication of a study conducted by Stafford, Stafford, and Schkade (2004), using a two-part process to determine a preliminary list of terms of uses and gratifications of Web 2.0 technologies and rating the perceived importance of the identified traits. It will also identify the levels of adoption of the specified Web 2.0 technologies. For the purpose of this study, participants were asked to focus on the Web 2.0 technologies Blogger, Facebook, Flickr, MySpace, Wikipedia, and YouTube.

These sites and terms have become synonymous with Web 2.0, and it is important to look at the adoption and acceptance of these new technologies, as it was with other new media of the past. This study will review how and why individuals use the particular Web 2.0 technologies identified and connect that to the level of adoption that has taken place. As new media are introduced, it is important to study and understand the reasons people use that new media. It is equally important to understand the actions that are taken because of those motivations. This study is important because while there have been a few studies of uses of some Web 2.0 technologies, this is one of the first studies that looks at how uses affect the adoption of Web 2.0. The popularity of this new phase of the Internet and the changing opportunities for use are widespread. The first generation of the Internet was an international phenomenon. Now that the control has been given to the user, a whole new audience has been identified. The impact of the adoption of these tools is widespread and unstudied.

To develop a foundation for this study, the relevant literature on uses and gratifications and the Internet is reviewed. Following this, literature pertaining to the diffusion of innovations and adoption of technology is examined. Next, a theoretical framework, overview, and research questions for this study are provided. The method and the original data generated for this study is explained. Finally, the results are reported and explained.

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CHAPTER 2

LITERATURE REVIEW

When examining how and why individuals use new media and how they

adopt it, it is important to look at the theoretical literature on uses and gratifications

and diffusion of innovations. Web 2.0 is a new form of the Internet. To apply past

research to this new technology it is important to review the theories as well as how

they were adapted to Internet research. First, the theory of uses and gratifications is

examined with additional focus on the demographic affects on uses and

gratifications, the uses of new media, and a review of the few studies conducted on

uses of Web 2.0. Next, the theory of diffusion of innovation is examined in

relation to adoption. Finally, additional literature on adoption of new technologies

is explored.

Uses and Gratifications

The uses and gratifications approach is applied to understand media use. It

is concerned with how and why people turn to the media they do. The following

section reviews this theory and how it has been applied to Internet usage.

Uses in this theory can be defined as how people choose and interact with

media. Gratifications can be defined as why and what users expect to get out of the

media. When reviewing uses and gratifications of media, it is sometimes helpful to

start at the end point, gratifications, and derive the needs from there. McQuail

(1969) proposed typologies of audience gratifications that included the categories:

diversion, personal relationships, personal identity, and surveillance. To further develop these audience gratifications typologies and apply them to the Internet, Stafford, Stafford, and Schkade (2004) conducted a study to determine the uses and gratifications of the Internet. This study found that the top five descriptive terms given as motivations for using the Internet were consistent with the audience gratification typologies diversion and surveillance, including information, email, research, news, and software. Related to the personal relationships and personal identity typologies identified, the next three motivation terms included chatting, entertainment, and communications. Eighmey and McCord (1998) found in their study of uses and gratifications of the Internet that factors associated with entertainment, personal relevance, and information involvement were reported most often. They also found that aligned with previous research of uses and gratifications, a primary use of the Internet is entertainment and exploration (Eighmey and McCord, 1998). Conversely, Kaye (1998) found a weak correlation between weekly Web usage and entertainment, social interaction, and escape gratifications.

As noted by Katz, Blumler, and Gurevitch (1973), audience gratifications can be derived from three distinct sources: media content, media exposure, and the social context that the media exposure takes place. A study conducted by Stafford, Stafford, and Schkade (2004) found that there were three components to uses and gratifications of the Internet: a process component, content component and social

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component. The process dimension of uses and gratifications shows a high desire for search capabilities. Content motivations include learning and information, and the content gratification element developed in this study highlights informational content as a strong motivation for consumer Internet access. People want and are attracted to information that adds value in form and substance, but that information needs to be available to users in an equivalent time period as the perceived value of the information (Eighmey & McCord, 1998). When approaching this need for information gathering and sharing, it is important that the systems that are created focus on the user's navigation process and knowledge management capabilities that can therefore enhance and drive use (Yang & Tang, 2005). Social gratifications identified in the Stafford, Stafford and Schkade (2004) study go beyond email, and they are worth considering as a key motivation for consumers using the Internet. Chatting and interacting with people on the Internet are key aspects of the social dimension of Internet use. This social dimension is evident in the central theme of audience gratifications presented by Katz, Blumler, and Gurevitch (1973) that mass communications is used to connect or disconnect with different kinds of others via instrumental, affective, or integrative relations. This view attempts to combine all individual gratifications into the need "to be connected." Enhancing chat capabilities and promoting a sense of community online could enhance the usage experience for consumers who have high social requirement for Internet use (Stafford, Stafford & Schkade, 2004). A study by Eighmey and McCord (1998)

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identified a new uses and gratifications dimension related to the interactivity of the Internet, including personal involvement and continuing relationships. According to Stafford, Stafford and Schkade's (2004) study, the social gratifications sought by Internet use suggest hedonic aspects of its use and enjoyment. When Internet use is approached from this perspective it can be described as leisure and play, a perspective often overlooked by marketers.

According to Katz, Blumler, and Gurevitch (1973), every medium offers a unique combination of characteristic contents, typical attributes, and typical exposure situations. The issue is what combination of these characteristics makes one medium a better source for need satisfaction over another. People use media strategically and employ different media for different purposes. They choose media based on what they know will help them satisfy specific needs or goals (Althaus & Tewksbury, 2000). Swanson (1987) discussed the need to consider the media content when researching uses and gratifications. Audience members have their own perceptions of media content, and various users may seek the same medium for different uses and gratifications. When looking at audience gratifications, it is important to note that the uses and gratifications theory has recently been expanded to include a dimension of gratifications sought and gratifications obtained where the expected outcomes of media exposure are compared to those actually gained (LaRose, Mastro, & Eastin, 2001). Related to this new dimension is the gratification niche of a medium which can be defined as

the breadth of gratifications obtained from a medium, as well as its niche breadth

on the gratification and gratification-opportunities dimension. Niche theory

provides a useful way to compare the ability of a medium to satisfy the needs of

users (Dimmick, Kline, & Stafford, 2000).

Eighmey and McCord (1998) noted a 1944 article in *Radio Research* in

which Herta Herzog described the functionalist perspective as focusing on the

question of the satisfaction people say they derive from using particular mass

media. This is further developed in Katz, Blumler, and Gurevitch's (1973)

perspective in which they noted elements of the "uses and gratifications model"

presented in Lundberg and Hulten's 1968 publication Individen och machmedia

that states that the audience is active and make their own decisions about what

media will satisfy their needs. They are active also in the way that they can self-

report the gratifications they seek. People evaluate their available media and make

decisions of what medium to use based on what they know of its ability to meet

particular needs or serve particular functions (Althaus & Tewksbury, 2000). This

concept goes beyond simply the gratifications that the user says they are looking

for and applies the gratifications that are actually gained by the media exposure.

Gratifications sought and gratifications obtained are similar to the enactive learning

dimension of social cognitive theory that explains how people learn from

experience. The social cognitive view says that interactions with the environment

shape media exposure and the outcomes of future media consumption (LaRose,

Mastro, & Eastin, 2001; Bandura, 1986). Initial use of a medium may happen by accidental exposure, curiosity, and popularity, but continued use of a medium would not likely occur if rewards were not available to the user (Eighmey and McCord, 1998). Using the social cognitive theory, LaRose, Mastro, and Eastin (2001) proposed that the expectations about positive outcomes of Internet use would increase usage and if negative outcomes were expected that would discourage use.

Demographics and Use

It seems that demographic factors are very important to the use and adoption of the Internet. Ethnicity, culture and age play a key role in perceptions of the Internet. The social influence model of technology use (Fulk et al., 1990) proposes that the organization of communications behind media perception explains the effects information has on group perceptions and attitudes toward technology. This results in the adoption of communication task requirements and communication technology use and behavior.

Older adults comprise a large portion of the country that do not use the Internet and have particularly negative perceptions of computers and the Web. According to Charness and Holley (2004), many factors play a role in the low usage of the Internet by older adults, which include access, motivation, ability, design, and training. Access is less of a problem now than it has been in the past because of the decreasing cost of personal computers. Motivation is a strong factor

because many older adults do not see the benefit of learning a new technology. Additionally, degenerated motor abilities due to age, poor design, and a high learning curve are all barriers to the adoption of the Internet by older adults. Aging affects how well older adults use existing technologies as well as how they learn to use new ones.

In addition to research on older adults and Web usage, there is a large body of work on youth and Internet use. The pattern of steady increase in Internet use by youth presents the possibility for new formations of youth culture around music, homemade videos, virtual social environments, politics and other forms of youth social and culture coordination and expression. Biocca (2000) found that contrary to other research on the uses of the Web, what attracts most people is not the information they can find there but other people. The Internet provides a unique environment for social relationship development, but a level of personal space is able to be maintained. Individuals who have difficulties forming social ties in face-to-face interactions are able to relieve some of that anxiety in a virtual social encounter and therefore seek social interaction on the Web. This is contrary to other research that has found that individuals who meet and socialize with others online have more social skills (Bonebrake, 2002). This phenomenon is seen in the growing popularity of Internet services that allow people to gather and create their own cohorts. Most of these online social groupings are made up of young users (Biocca, 2000).

An example of how culture affects Internet use was exemplified in a study of the attitudes and perceptions of the Internet by U.S. Latinos. In this study, Leonardi (2003), found the opposite of what is stated previously. Latinos did not see the Internet as a vehicle to enhance interpersonal communications and keep people connected. Rather it was viewed negatively as a distraction to interpersonal relationships and activities. These cultures highly value family and interpersonal relationships, and tools that do not enhance that will be viewed negatively. Additionally, language plays a factor in Latinos perceptions and use of the Internet. At the time of this study very few platforms were available in Spanish, and only 1.5-2% of the content of the Web was in Spanish (Leonardi, 2003).

Uses of New Media for Social Capital

The Internet has been found by researchers to enhance the production of social capital, or the connections within and between social networks and individuals, both on and off line. Although, some research argues that the Internet actually diminishes social contacts and interactions.

One such negative view of the Internet and production of social capital comes from a study conducted by Shah, Kwak, and Holbert (2001) that says people's Internet use for social recreation is consistently and negatively related to their engagement in civic activities, trust in others, and contentment with life.

The converse side of this argument is the ability of users of the Internet to produce and keep connections with social capital and communities. After

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Hurricane Katrina struck New Orleans, Procopio and Procopio (2007) conducted a study to determine if those displaced used the Internet to develop their social capital and sense of community. The purpose was to see if in a crisis which displaces a geographic community, people turn to the Internet to find a sense of community. Their study found that respondents activated a number of social networks with the Internet during the crisis including familial (59%), social (79%), geographic (31%), and school-related (25%). The Internet served to activate both strong and weak ties in this crisis. Additionally, respondents said part of the goal to activate these social networks was uncertainty reduction through gathering information on property damage, spreading the word of their status to friends and family, and gathering information on their friends (Procopio & Procopio, 2007).

Similarly, the Internet serves to create a sense of community for individuals who have migrated and not necessarily been forcefully displaced. A study by Hiller and Franz (2004) of the uses of the Internet for social capital of migrants to Newfoundland found that these individuals used the Internet to activate three types of relationships: old ties, new ties, and lost ties. Hiller and Franz suggested that migrants use the Internet to keep their ties to their homeland. Communication with others through the Internet builds an online community from a general sense of belonging based on a group identity and territorial homeland and is reinforced by interaction online. Many of these individuals have their cultural roots in other parts of the world but still have a need for human contact. The desire to stay in touch

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with a globally dispersed family inexpensively is a driving force behind the adoption of the Internet in homes (Bakardjieva & Smith, 2001).

Bakardjieva and Smith (2001) found that respondents felt obligated to explain the usefulness of their Internet interactions. A study of these responses found the following characteristics of Internet experience as needed, useful and significant and they all resemble uses for connecting, creating, or enhancing social capital:

(1) isolation brought about by circumstances such as sickness, dysfunctional marriage, single parenthood, retirement, and unemployment;
(2) dislocation or recurrent change of location;
(3) globally spread family and social networks;
(4) lack of intellectual challenge in current work
(5) uncertainty or dissatisfaction with current job;
(6) sense of belonging to a disperse community of interest – quite often a community of suffering. (Bakardjieva & Smith, 2001, p.71)

From this study, Bakardjieva & Smith (2001) found behavior genres in the use of the everyday Internet, which included "participation in online support groups; holding together a fragmented national and cultural identity; sustaining globally spread social and family networks; political organizing; talking back to institutions of power; rationalizing everyday activities; connecting local and global interest group, etc."(p. 80)

Uses of Web 2.0

The introduction of social collaborative technologies has resulted in a fast-growing online community. The Web is going through an important shift towards

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Web 2.0 characterized by a social Web in which the user has a greater role in the production of content with blogs, wikis, and social networking sites (Fu, Liu, and Wang, 2007).

Two new technologies for information dissemination are blogs and podcasts. Blogs are typically personal and individual and are used for insights into the bloggers' activities and perceptions (Thelwall & Stuart, 2007). Podcasts are enabling technological personalization driven by subject feeds via the Web and add spatial flexibility to Webcasting to create a personalized, customized media environment (Shim et al., 2007).

An important feature of a blog is the RSS feed function that allows a user to subscribe to the blog and receive updates in a RSS reader where all of a user's subscriptions will feed into one place (Thelwall & Stuart, 2007). Universities are taking advantage of RSS functions in podcasting for making guest lectures available to wider audiences and replacing existing printed newsletters.

Shim et al. (2007) conducted a study to determine students' perceptions of podcasting in order to explain the relationship between motivations and future usage of podcasting in academia. Media richness is an important aspect of determining future media use as well as immediacy, personal focus, transmission of cues, functionality, usability, and ease of use. They found that personal focus, usability, and user motivations are significantly associated with future use.

Additionally, Thelwall & Stuart (2007) found that three new Web 2.0 technologies emerged as important to sharing information in times of crisis: Flickr, Wikipedia, and Wikinews. Other new technologies were listed as important including SMS, webcams, and blogs. Web 2.0 technologies are useful for communicating and collecting information on crisis events because they are real time and can be updated by the user.

Diffusion of Innovations

Rogers' (1995) diffusion of innovations theory is important when looking at the adoption of a new technology because it focuses on the process of adoption. "Diffusion is the process by which an innovation is communicated through certain channels over time among members of a social system" (Rogers, 1995, p. 10). There are four main elements in this definition that are essential to the diffusion process: innovation, communication channels, time, and social system. Diffusion is the rate and extent that messages about a new idea are communicated. The Bass Model of Diffusion, developed by Frank Bass (1963) is a mathematical derivation of the basic assumptions of the market size and the behaviors of innovators and imitators on the rate of new-product diffusion. It is the only model that considers the communication process between innovators and imitators for innovation diffusion (Mahajan, Muller, and Srivastava, 1990). Diffusion is a social change defined as alterations in the structure or function of a social system (Rogers, 1995).

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Social shaping of technology theory emphasizes the importance of human choices and action in a technological change like diffusion (Lievrouw, 2006).

Characteristics of innovations help to explain the rate of adoption. These characteristics are (1) relative advantage, the degree to which the innovation is perceived as superior to that before it; (2) compatibility, consistent with the existing values of potential adopters; (3) complexity, the difficulty of use and understanding; (4) trialability, the degree to which an innovation can be tested out before a decision is made; and (5) observability, the results of an innovation are visible to others. Innovations that have higher relative advantage, compatibility, trialability, and observability and are less complex will be adopted quicker (Rogers, 1995).

There are five main steps in the innovation-decision process: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1995). The rate at which an individual goes through this process results in an adopter category. Adopter categories are based on the level of innovativeness. Innovativeness is the rate at which an individual is earlier in the adoption process than another. The categories include innovators, early adopters, early majority, late majority, and laggards (Rogers, 1995). In the Bass model of diffusion there are two types of adopters, innovators and imitators. The adoption of a technology by an innovator is not affected by others who have adopted or by timing. Imitators on the other hand are influenced by others who have already adopted an innovation (Mahajan,

Muller, & Srivastava, 1990). Critical mass is the point in the diffusion process where enough people, as a proportion of potential users, have adopted an innovation that the process becomes self-sustaining. The rate of adoption for new media proceeds slowly until critical mass is reached and then shoots up rapidly. Critical mass is more pronounced in new media because of the interactive nature of it. Individuals are able to interact through the computer and each individual's actions are dependent on other's (Rogers, 1997).

<div align="center">Adoption of Technology</div>

Davis' (1989) technology acceptance model provides an explanation of the determinants of computer system acceptance. It focuses on two aspects, perceived usefulness and perceived ease-of use. Karahanna and Straub (1999) attempted to understand the relationship between perceived usefulness and perceived ease of use and the adoption of technology. Their study found that according to the theory of reasoned action, cognitive beliefs such as perceived usefulness and perceived ease of use immediately affect attitudes and intentions to use an object. A study by Adams, Nelson, and Todd (1992) found that both ease of use and usefulness are significantly correlated with self-reports of frequency of use. In this replication study the factors of analysis for usefulness included work more quickly, job performance, increased productivity, effectiveness, makes job easier, and useful. The factors of ease of use included easy to learn, clear and understandable, easy to

become skillful, easy to use, controllable, and easy to remember (Adams, Nelson, & Todd, 1992).

A study by Al-Gahtani and King (1999) on the attitudes towards usage found that the attitudes towards system usage were significantly affected by ease of use, relative advantage, enjoyment, and usage. They also determined that ease of use had an effect on enjoyment and enjoyment had an effect on relative advantage. Relative advantage predicted end-user computing satisfaction. Additionally, Agarwal and Prasad (1998) refer to the aspect of Rogers' theory of diffusion of innovations that adoption is an uncertainty reduction process in which potential adopters seek information to learn about the expected consequences of using an innovation, an assessment and evaluation of the information gained determines adoption. Karahanna, Straub, and Chervany (1999) determined that attitudes toward adoption or continued use were derived by the strength of the person's belief that adoption or continued use would lead to certain consequences. The intention to adopt is determined by personal interests that reflect an individual's positive and negative evaluations of performing a behavior and social interests that refer to the individual's perceptions of the social pressures to adopt or not (Karahanna, Straub, & Chervany, 1999).

Individual, organizational, and IT characteristics influence user perceptions, attitudes, satisfaction, and usage (Al-Gahtani & King, 1999). The study by Huff and Munro (1985) defined IT assessment and adoption as "the organizational

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policies, strategies, processes, and tasks employed, either explicitly or otherwise, by an organization in its efforts to identify, acquire, and diffuse appropriate information technology"(p. 328).

Overview and Theoretical Framework

Uses and gratifications theory attempts to explain how and why people use media. With the introduction of new media it is even more important to understand how individuals have used technology in the past and what they seek to gain from consumption of something new. Although Web 2.0 technologies are for the most part in their infancy, they are built off of a similar framework as the Internet. In the review of the literature on uses and gratifications this paper focused on how and why the audience uses the Internet with the intent to apply some of the same concepts to the uses and gratifications of Web 2.0.

The diffusion of innovations theory is very important to the study of new media. This theory attempts to explain the process of adoption in order to predict behavior and attitudes towards new media. The changing structure of diffusion that has been seen with new media because of its interactive and social characteristics is also beneficial in explaining future use. Additional approaches to adoption, such as the technology acceptance model that evaluates user attitudes to predict adoption behavior, are useful in a study of new media adoption.

Uses and gratifications theory serves as the key theoretical framework for this study. Researching how users currently use Web 2.0 technologies and why they use them will provide a foundation for the level of adoption. Additionally, the diffusion of innovations theory is used to review the patterns in the stage of adoption of a small sample of Web 2.0 technologies.

CHAPTER 3

METHOD

The purpose of this study was to determine the uses and gratifications of Web 2.0 technologies and if levels of adoption by users are related to the uses identified.

Sample

The pool of participants for this study were gathered using a convenience sample of Internet users between the ages of 18 and 60, and included undergraduate and graduate students, teachers, medical workers, and professionals from various industries. There was a total sample of 234 participants, 51 for the first part of the study and 183 for the second part of the study.

To gather this sample, users who were known personally to the researcher were identified to participate in the study and then asked to identify others who were interested in participating in the study as well. Due to the nature of the sample, the results of this study are not generalizable to the population.

Data Collection Method

This study consisted of two parts. Based on a study conducted by Stafford, Stafford, and Schkade (2004) to determine the uses and gratifications of the Internet, the first part of the study used an open-ended questionnaire of word association probes to collect a preliminary list of descriptive words for uses and sought gratifications of Web 2.0 technologies. The four questions used in the

original study were modified to reflect Web 2.0 technologies. For the purpose of this study the Web 2.0 technologies Blogger, Facebook, Flickr, MySpace, Wikipedia, and YouTube were the focus. The first group of participants were given the above list of technologies and asked:

1. What is the first thing that comes to your mind when you think about using the technologies listed here?
2. What other words describe what you enjoy about using the technologies listed here? If you do not use any of these technologies please note that here.
3. Using single, easy-to-understand terms, what do you use these technologies for?
4. What activities are most important to you when using these technologies?

The responses to these questions were compiled, similar terms combined, and the overall frequency of terms recorded.

The terms identified four or more times in the first part of the study were used to create the questionnaire for the second part of the study. This second part was also based on the study conducted by Stafford, Stafford, and Schkade (2004) modified to research the Web 2.0 technologies listed above and to collect data on adoption status of respondents. The second group of participants was given a questionnaire that listed the use terms identified in the first part of the study and asked to indicate their perceived level of importance of each term when using the listed Web 2.0 technologies using a seven-point semantic differential scale weighted by "very important" as 7 and "very unimportant" as 1, the same scale used in the original study by Stafford, Stafford, and Schkade.

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In addition to rating the importance of the terms identified for uses and gratifications, respondents were given the list of Web 2.0 technologies specified for this study with a list of years and asked to identify the year they started using each technology and the frequency of use of each technology. They were also asked to identify how they learned to use the technologies and rate their perceived ease of use for each. These last questions were based on the research conducted by Karahanna and Straub (1999) that found that according to the theory of reasoned action, cognitive beliefs such as perceived usefulness and perceived ease of use immediately affect attitudes and intentions to use an object.

Both questionnaires were created using Survey Monkey with the consent form built in. The link for the first part of the study was sent to potential respondents and a few of those respondents were asked to forward the link to colleagues, friends or family. The researcher also printed hard copies of the survey to give to those who could not easily access a computer. This process was duplicated for the second survey to a different set of participants.

Study Period and Cost

This study was conducted over a three-month period between December 2008 and February 2009. The cost of this study was minimal. Expenses included $60 for a three month subscription to Survey Monkey, $40 for purchasing SPSS software, and $50 for printing, copying, and postage. These expenses were funded by the researcher.

Research Questions

RQ1: What are the self reports of how and why Web 2.0 technologies are used? Are they similar to the uses identified for the Internet? What uses are most important when using Web 2.0 technologies?

RQ2: Is the adoption of Web 2.0 technologies following the pattern introduced by Rogers' diffusion of innovations theory (1995)? Is it varied based on specific technologies?

RQ3: What is the perceived ease-of-use of Web 2.0 technologies?

Hypotheses

Additionally, this study considered the following hypotheses:

Hypothesis 1: The reported importance of each trait term for use will be positively correlated with the frequency of use of technologies generally characterized as having those traits. For example, as the importance of social networking increases so will the frequency of use of Facebook.

Hypothesis 2: The reported ease of use of each technology will be positively correlated with the frequency of use of that technology.

CHAPTER 4

RESULTS

Web 2.0 has been coined as the next generation of the Internet. This study

used a modified replication of the study by Stafford, Stafford, and Schkade (2004)

that researched the uses of the first generation of the Internet. There were two parts

to this current study to determine both the uses of Web 2.0 technologies as well as

the level of adoption.

The questionnaire for the first part of this study was active on Survey

Monkey for one week and hard copies of the questionnaire were provided to

individuals that requested them and filled out in the same week. In this time 57

responses were gathered, 51 of which were completed and usable. Of the

respondents, 55% were female and 45% male; 49% were 18-24 years of age; 29.4%

were 25-34; 9.8% were 35-44, and 11.8% were over 45.

RQ1 asked what the self reports of how and why Web 2.0 technologies are

used. From the responses to the first survey a total of 440 descriptive terms for

uses of Web 2.0 were provided. Same and similar terms were grouped together.

As shown in Table 1, 17 were reported more than four times. Out of these 17

terms, the top 15, identified in the table in boldface, were used for the second part

of the study due to space limitations.

Table 1

Uses of Web 2.0 Identified in Questionnaire 1

Use Term	Overall Frequency of Response
Information/Learning/Research	56
Connecting with others / Keeping in Touch	37
Communication	35
Networking/ Socializing / Social Networking	30
Entertainment	28
Chatting/Talking to others	17
Find anything /Looking stuff up	17
Easy to use	17
Fun/Funny	14
Music	14
Video	14
Comments	10
Friends	9
Pictures	9
Killing time	8
Sharing	7
Games	4

Note: Use terms in bold were used to construct the survey for second part of study

The top 15 terms identified from the first part of the study were used to construct the second survey in which respondents were asked to indicate their perceived level of importance of the descriptive terms when using the Web 2.0 technologies Blogger, Facebook, Flickr, MySpace, Wikipedia, and You Tube. The second survey also asked respondents to identify the first year they used each of the listed Web 2.0 technologies, how often they used these technologies, how they

learned about them and how to use them, and the ease of use of each of the technologies.

The questionnaire for the second part of the study was live on Survey Monkey for one week and hard copies of this survey were also filled out in this week. During this time 183 usable responses were collected. Of the respondents 74% were female and 26% were male; 18.6% were18 -24 years of age; 27.9% were 25-34; 26.2% were 35 – 44, and 25.1% were 45 years of age or older.

The third part of RQ1 asked what uses were most important when using Web 2.0 technologies. Using SPSS 17.0 Grad Pack to run a frequency report of the levels of importance for the descriptive terms of uses, those identified as "very important" as a majority were *research, information, and learning; connecting with others and keeping in touch; communication; looking up and finding anything; easy to use; friends, and pictures*. No terms were reported as "very unimportant" as a majority but the descriptive term reported as "very unimportant" the most was *killing time*. Table 2 is a comprehensive look at respondents' ratings of each descriptive term's level of importance on the seven point semantic differential scale when 1 was "very unimportant' and 7 was "very important."

Table 2

Importance of descriptive terms when using Web 2.0 Technology

Descriptive Terms	Percentage of Levels of Importance (n=183)						
	Very Unimp. (1)	Somewhat Unimp. (2)	Unimp. (3)	Neutral (4)	Imp. (5)	Somewhat Imp. (6)	Very Imp. (7)
Research/ Information/ Learning	12	9	11	14	16	15	**24**
Connecting with others/ Keeping in Touch	6	4	4	8	15	22	**42**
Communication	6	4	8	14	14	25	**31**
Networking/ Socializing/ Social Networking	7	7	5	15	21	21	**24**
Entertainment	7	6	8	19	18	23	19
Chatting	13	13	11	17	23	12	12
Looking up/ Finding anything	8	7	6	16	18	18	**27**
Easy to use	7	4	2	6	14	24	**44**
Fun	8	9	7	12	25	23	21
Music	15	12	11	15	21	12	14
Video	8	9	11	18	21	18	15
Comments	10	11	11	19	19	18	11
Friends	5	5	5	11	18	20	**36**
Pictures	6	6	5	12	20	22	**29**
Killing time	16	10	12	23	12	9	14

Note: Items in bold are the terms reported as "very important" by the majority of respondents and the corresponding percentage.

The remaining questions on the survey were used to identify when users

began, the amount of and ease of use of the Web 2.0 technologies Blogger,

Facebook, Flickr, MySpace, Wikipedia, and You Tube.

These technologies are fairly new technologies. Most of the users in this

study began using these technologies in 2006 to 2008. RQ2 asked if the adoption

of Web 2.0 technologies followed the pattern introduced by Rogers' diffusion of

innovations theory and if it varied by technology. Figure 1 shows graphs for year

of first use for each technology as reported by respondents in this survey. This

study found that some of the curves follow the beginning of an s-curve used to

identify the rate of adoption of new technologies by the diffusion of innovations

theory. According to these graphs, the respondents to this survey vary in their level

of adoption of Web 2.0 technologies based on the technology. Blogger and

Facebook appear to be following the beginning of the s-curve and the majority of

users in this study are in the early adopter stage of these technologies. Flickr,

Wikipedia, and You Tube appear to have started with the standard uptake in use but

have tapered off in recent years. And the curve for My Space, has increased but
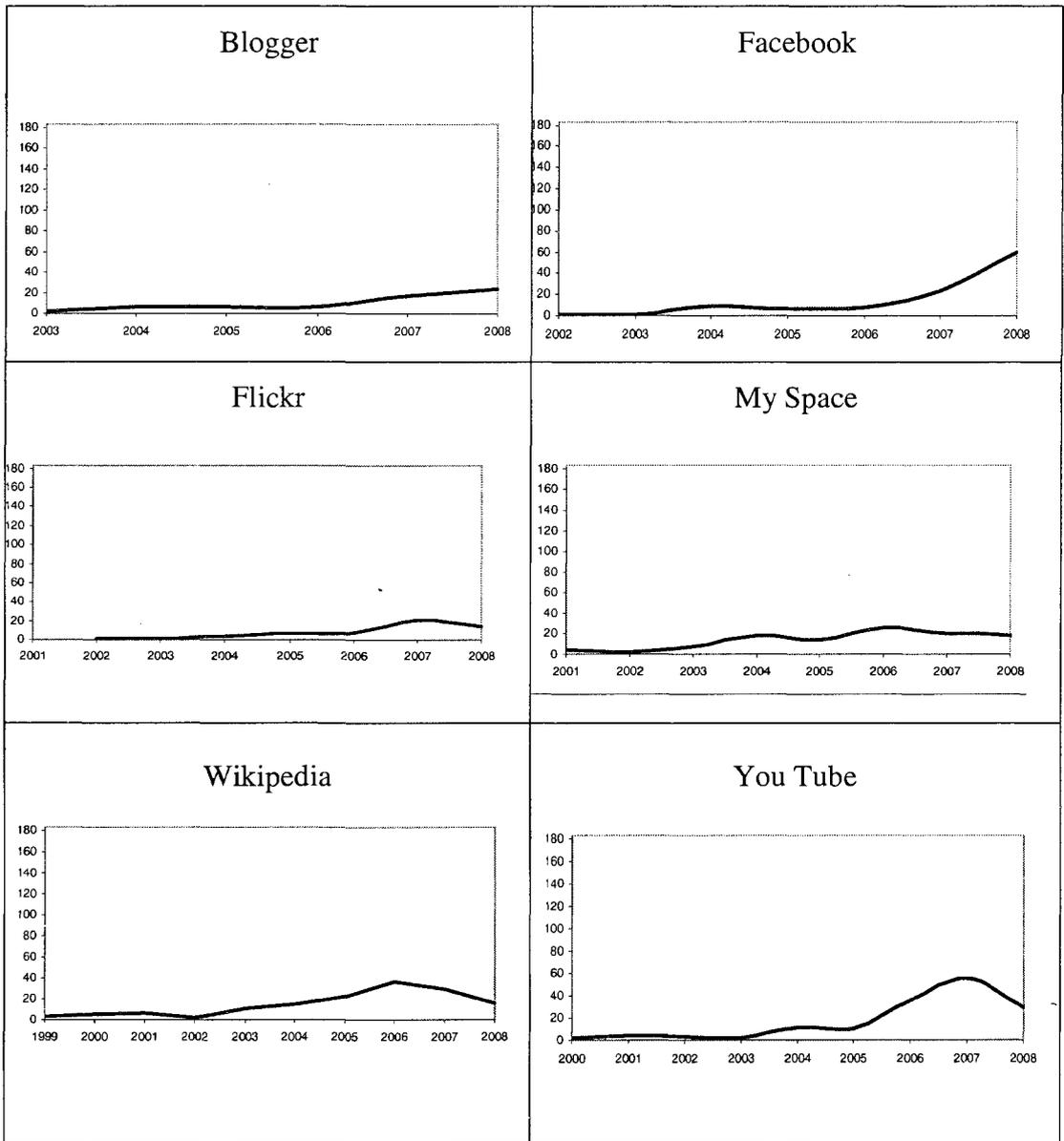
varies by year.

Figure 1

Adoption Curves for Web 2.0 Technologies

Note: The x-axis is years. X-axis maximum is 2008, the last full year of use at the time of this study in February 2009. The x-axis represents number of respondents. Y-axis maximum is 183, the number of total respondents.

This study also determined the frequency of use for these technologies. The measures for frequency of use were (a) everyday; (b) often, at least once a week; (c) sometimes, at least once a month; (d) not often, at least once a year, and (e) never. Table 3 shows the percentages of frequency of use reported for each of the six technologies. Out of the six technologies Facebook and Wikipedia had the majority of respondents report use everyday or often. Blogger, Flickr, and My Space were reported as never being used by the majority of respondents. You Tube was reported as being used sometimes by the majority of respondents.

Table 3
Frequency of Use of Web 2.0 Technologies

Technology	Percentage of Respondents (n=183)				
	Everyday	Often	Sometimes	Not often	Never
Blogger	3	5	13	17	**61**
Facebook	**37**	17	8	6	32
Flickr	1	5	9	15	**70**
MySpace	8	14	16	17	**46**
Wikipedia	8	**41**	23	16	11
You Tube	6	32	**36**	18	7

Note: Items in bold are those representing the majority of responses.

H1 stated that the reported importance of each trait term for use would be positively correlated with the frequency of use of technologies generally characterized as having those traits. This study partially confirmed this hypothesis. Table 4 represents the correlation between the frequency of use of each technology and the value of the descriptive terms for use.

Table 4

Correlation of Frequency of Use and Level of Importance of Uses

Use Term	Correlation					
	Blogger	Facebook	Flickr	MySpace	Wikipedia	YouTube
Research/ Information/ Learning	.211**	.098	.124	.038	**.386****	.172*
Connecting with others/ Keeping in Touch	.231**	**.469****	.064	.231**	.196*	.219**
Communication	**.303****	.391**	**.159***	.219**	.202**	**.301****
Networking/ Socializing/ Social Networking	**.337****	**.483****	**.167***	.158*	.261**	**.299****
Entertainment	.189*	.271**	.100	.209**	.113	.259**
Chatting	.232**	.277**	.040	**.291****	.016	.237**
Looking up/ finding anything	.209**	.172*	.131	-.019	**.375****	.227**
Easy to use	**.278****	.397**	**.149**	.153*	**.263****	.253**
Fun	.185*	.435**	.043	.286**	.149	.225**
Music	.016	-.006	.031	**.380****	.136	.285**
Video	.251**	.198*	.082	.116	.205**	**.439****
Comments	.273**	.347**	.072	.256**	-.043	.167*
Friends	.233**	**.444****	.140	- **.304****	.162*	.199*
Pictures	.203**	.316**	.138	.281**	.128	.292**
Killing time	.039	.220**	-.019	.297**	.060	.229**

Note: Entries are Pearson Correlations (r).
 Bold entries are the top three highest correlations for that technology
 * correlation is significant at .05 level (2-tailed)
** correlation is significant at .01 level (2-tailed)

Table 5

Alignment of Technology Description and Uses

Technology	Description	Uses with Highest Correlation	Comments
Blogger	"helping people have their own voice on the Web and organizing the world's information from the personal perspective." (Blogger.com)	- Networking/ Socializing/ Social Networking - Communication - Easy to Use	Uses are similar to description but not an exact match.
Facebook	"Facebook gives people the power to share and makes the world more open and connected. People use Facebook everyday to keep up with friends, upload an unlimited number of photos, share links and videos, and learn more about the people they meet." (Facebook.com)	- Networking/ Socializing/ Social Networking - Connecting with others/ Keeping in Touch - Friends.	Uses are an exact match to the characteristics of the technology.
Flickr	"Flickr has two main goals: to help people make their content available to the people who matter to them and to enable new ways of organizing photos and video." (Flickr.com)	- Communication - Networking/ Socializing/ Social Networking - Easy to use	Uses do not align with characteristics; may be due to the small sample size and low usage.
MySpace	"MySpace is an online community that lets you meet your friends' friends." (MySpace.com)	- Music - Friends - Chatting	"Friends" and "Chatting" are accurate, "Music" is not aligned with this description.
Wikipedia	"Wikipedia is a multilingual, Web-based, free-content encyclopedia project that has become one of the largest reference Web sites" (Wikipedia.com)	-Looking up/ Finding anything - Research/ Information/ Learning - Easy to Use	Uses are an exact match to the characteristics of the technology.
You Tube	"You Tube allows people to easily upload and share video clips" (You Tube.com)	- Video - Communication - Networking/ Socializing/ Social Networking	Video is correlated significantly higher than the other two by .138, aligned with characteristics of You Tube

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Table 5 on the previous page shows the descriptions of each technology as reported by the technology's Website and the use terms with the highest correlations.

The nature of Web 2.0 is that content is made richer by the user. Therefore, the technologies are designed to be easy and require little to no training. The majority of respondents, 82%, learned about the technologies from friends, and 80% learned to use them on their own. RQ3 asks what the perceived ease-of-use of Web 2.0 technologies is. According to this study, every technology had a majority of its users rate the ease of use as "easy" to "very easy". Blogger and Flickr were both rated "easy" by 39% of users; Facebook, MySpace, Wikipedia, and You Tube were rated "very easy" by 47%, 40%, 77%, and 69% of users respectively.

H2 stated that the reported ease of use of each technology would be positively correlated with the frequency of use of that technology. Table 6 shows the Pearson Correlations between ease of use and frequency of use for each technology. This study found that all technologies have a positive correlation.

Table 6
Correlation between Frequency of Use and Ease of Use

Technology	r	p level
Blogger	**.41**	.001
Facebook	**.32**	.000
Flickr	**.40**	.004
MySpace	**.37**	.000
Wikipedia	.14	.080
You Tube	**.25**	.002

Note: Entries are Pearson Correlations (r) and significance levels (p level) for a two-tailed test. Bold entries are statistically significant at the .05 level.

CHAPTER 5

CONCLUSION

The purpose of this study was to determine the self reports of uses and ease

of use of Web 2.0 technologies and the affect on adoption. Additionally, this study

compared the uses reported for Web 2.0 technologies and those reported for the

Internet. This study found that the identified uses of Web 2.0 are similar to those

identified for the Internet although a few additional uses for Web 2.0, not identified

for the Internet, reflect the social and user-oriented nature of these technologies.

This study also found the frequency and length of use of Web 2.0 technologies

containing characteristics that are similar to the uses identified as important or very

important to respondents, were positively and significantly correlated.

This study was a modified replication of a 2004 study by Stafford, Stafford,

and Schkade researching uses of the Internet. The results of this study found that

the uses of Web 2.0 technologies identified were very similar to those identified in

the original study. The second part of RQ1 asked how the self reports of uses of

Web 2.0 technologies compared to those reported for the Internet. Of the 45 terms

reported more than 4 times in Stafford, Stafford and Schkade's study on the uses

and gratifications of the Internet, 20 were reported at least once in this study and 11

were part of the top 15 used for the second survey (information, learning, and

research were combined in the current study). Terms not repeated were:

connecting with others or keeping in touch, which are similar to the terms people

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and interaction in the Stafford, Stafford, and Schkade study; *killing time*, similar to

the terms surfing, relaxing, and browsing reported in the Stafford, Stafford, and

Schkade study; *networking, socializing, and social networking*; *music*; *videos*;

comments; and *pictures*. These terms that were not reported in the initial study are

indicative of the social nature of Web 2.0 technologies and the ease of sharing

information and content with others using these technologies.

Stafford, Stafford, and Schkade found in their study that the top five terms

identified for use were consistent with McQuail, Brown, and Blumler's (1972)

audience gratification typologies diversion and surveillance (information, email,

research, news), and the next three were identified by the personal relationships and

personal identity typologies (chatting, entertainment, and communications). The

top response in the current study is consistent with the diversion and surveillance

typology (information, learning, and research) but unlike the Stafford, Stafford, and

Schkade study, the other terms included in the top five are related to the personal

relationships and personal identity typologies. These include: *connecting with

others or keeping in touch; communication; networking, socializing, or social

networking; and entertainment*. This result shows that, aligned with the social

nature of Web 2.0, when using Web 2.0 technologies compared to the Internet,

personal audience gratification typologies are more important than the diversion

and surveillance gratification typologies.

In addition, the Stafford, Stafford, and Schkade study identified three components of uses and gratifications for the Internet: a process component, content component, and social component. The uses identified for Web 2.0 in this study are consistent with these component categories. Of the top 15 use terms identified from the first part of the current study, four can be categorized as process components (*find anything and looking stuff up; easy to use; fun or funny; and killing time*); five are content motivations (*information, learning, and research; entertainment; music; video; pictures*); and six terms are social components (*connecting with others and keeping in touch; communication; networking, socializing or social networking; chatting or talking with others; comments; and friends*).

Explaining adoption of these technologies was difficult in this study. The adoption levels of these Web 2.0 technologies by this study's respondents were low. This may be due to the small sample size, demographics of respondents, or that these technologies are new. According to Rogers' (1995) diffusion of innovations theory, there are five characteristics of innovation that explain adoption: relative advantage, compatibility, trialability, observability, and complexity. New technologies that have high relative advantage, compatibility, trialability, observability, and are less complex are more likely to be adopted sooner and by more users. Applying these characteristics to the Web 2.0 technologies in this study may help to explain the levels of adoption.

Relative advantage is the viewpoint that a new technology is better than others introduced before it. Web 2.0 technologies are different than Internet technologies of the past because the users are able to control the content and do more things with the applications than before. For some this is an advantage because they own their content.

Compatibility is the consistency with potential adopter's existing values. This may serve as a large roadblock in the process of adoption of Web 2.0 technologies because many potential adopters do not see the value of the tools and therefore there is a low level of compatibility with those individuals.

Most Web 2.0 technologies are easy to use without commitment and can be changed or deleted at any time without consequence. The trialability of these technologies is high because potential adopters can easily try out many of these technologies before becoming full adopters.

This study showed that Web 2.0 technologies are social and that many users found out about or know of the technologies from friends who use them. Observability is high because potential adopters are able to see how and why others use the technologies before becoming users themselves.

Finally, the nature of Web 2.0 is that it is easy to use because the technologies are meant to have the users own and manipulate the content. To allow this, the technologies need to be simple and quick to learn. These technologies are less complex and little knowledge of technology is necessary to utilize the tools.

The results of this study seem to show that Web 2.0 technologies are in the very early phases of adoption and vary based on different applications. In referring to the characteristics of innovation that effect adoption proposed by Rogers, many potential users do not see the relative advantage and compatibility of the tools. Just by the nature of Web 2.0 technologies, trialability, observability, and low complexity are built in but if the potential user does not see the value of the technologies they will not care about trying the tools, seeing them in use, or how easy they are.

An interesting finding in this study that should be researched further is the curve of adoption for some of the technologies. When plotting out the graphs of number of users of each technology over time, some of the curves revealed a reverse u-shape. Blogger and Facebook appear to follow the beginning of an s-curve, which is expected when looking at the adoption of new technologies but Flickr, MySpace, Wikipedia, and You Tube show a slow uptake, a slight peak, and then a decline. This result may be due to the low sample size, demographics of respondents or low levels of use by respondents but could also be a new trend in the adoption of Web 2.0 technologies. This decline of use may show that these tools will never reach a point of sustainability rather they will have an influx of popularity for a time because of their social nature and then lose their "luster" once a new, similar tool is introduced. The perspective is that the market is saturated

with all of these new Web 2.0 tools and because they are the user contributes to and control the content, the individuals can only focus on a few at a time.

The limitations of this study were the small sample size and a sample that was not representative of the population. Due to limited budget and time, the respondents were, or were identified by, individuals known to the researcher. Additionally, the research showed that very few respondents were aware of the Web 2.0 technologies included in this study.

The results of this study are new and unique. Web 2.0 is a popular topic in schools, corporations, and social groups. Researching and understanding the uses for these new types of technologies reveals how to enable adoption. Comparing these uses to those of the Internet reveals the true differences in this next generation of online tools and technologies. Additionally, this study is the first of its kind in relating uses of Web 2.0 to the adoption of the Web 2.0 technologies. This study successfully identified the uses of Web 2.0 and the effect of uses on adoption. Additionally, it confirmed that the ease of use of technologies are important in the adoption process. The social and easy to use nature of Web 2.0 technologies are ultimately the strongest factors in the adoption of this new generation of the Internet.

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