

Factors that influence the use of Web 2.0 tools for e-learning

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**To my beloved dad,
Mohammad Rasul Mohammadyari
1923 - 1998**

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Soheila 28/02/2012

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Abstract

Web 2.0 tools, such as blogs, wikis, podcasts, and RSS feeds, provide users with a flexible, collaborative and interactive environment for developing communities around shared interests. These tools are especially useful for professionals, such as accountants and lawyers, working in small and medium-sized enterprises (SMEs) for their continuing professional development (CPD) because they can obtain access to high-quality resources and interact with training providers and their peers at a much lower cost. However, there has been relatively little adoption of such tools by this group of professionals, and little relevant empirical research on this issue.

This study addressed this issue by examining the adoption of Web 2.0 tools by accounting professionals in New Zealand SMEs. A research model based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Expectation Disconfirmation Theory (EDT) was drawn up and tested with a survey and a series of semi-structured interviews. 40% of the respondents use Web 2.0 tools, and 45.9% plan to continue using them in the future. The results indicate that digital literacy and performance expectancy were significantly related to the decision to adopt Web 2.0 tools. The interview findings support the variables used in the model, and offer additional insights on the barriers hindering the adoption of Web 2.0 tools. The study highlights certain trends in the adoption of this technology and provides guidance to future researchers and practitioners in this field.

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Acronyms

ACCA	Association of Chartered Certified Accountants
ADPT	Adoption
APs	Accounting Professionals
AUT	Auckland University of Technology
CFA	Confirmatory Factor Analysis
CI	Continuance Intention
CPA	Certified Practicing Accountant
CPD	Continuing Professional Development
DIT	Diffusion of Innovation Theory
DL	Digital Literacy
EC	Expectation Confirmation
EDM	Expectation Disconfirmation Model
EDT	Expectation Disconfirmation Theory
EE	Effort Expectancy
E-learning	Electronic Learning
EOU	Ease Of Use
FC	Facilitating Conditions
ICT	Information Communication Technology
IS	Information System
IT	Information Technology
ITU	Intention To Use
NZ	New Zealand
NZICA	New Zealand Institute of Chartered Accountants
PE	Performance Expectancy
PEOU	Perceived Ease Of Use
PLS	Partial Least Squares
PU	Perceived Usefulness
RSS	Really Simple Syndication
S	Satisfaction
SBA	Small Business Accounting
SEM	Structural Equation Modeling
SI	Social Influence
SMEs	Small and Medium-Sized Enterprises
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
U	Usefulness
UTAUT	Unified Theory of Acceptance and Use of Technology
WWW	World Wide Web

CHAPTER 1: INTRODUCTION

This thesis examines the adoption of Web 2.0 tools by professionals for their Continuing Professional Development (CPD) needs. This chapter introduces the topic and the motivation for studying it, and concludes with an overview of the thesis.

1.1 Research overview

Training is a strategic tool for organizations and has been found to reduce employee turnover and increase their profitability (Ong, Lai, & Wang, 2004). From an individual perspective, training keeps employees aware of the latest technologies and knowledge in their fields, and helps them remain competitive. Information Technology (IT) has significantly altered the way we learn and how we are trained, and companies are increasingly using e-learning to enhance the consistency and convenience of their training activities. E-learning refers to the use of technology to deliver information and instruction to users (Salas, Kosarzycki, Burke, Fiore, & Stone, 2002). A variety of instructional material (text, video, and audio) is integrated and conveyed via online discussions, quizzes, live chat sessions, and assignments. E-learning allows asynchronous and synchronous interaction between learners and trainers (Salas et al., 2002).

E-learning has been greatly enhanced by the use of Web 2.0 technologies, such as blogs, podcasts and wikis, because they enable flexible, learner-centered training. For example, training can be provided “on-demand” to better meet the needs of employees who are geographically dispersed or have conflicting schedules. Web 2.0 technologies are especially appealing to Small and Medium-Sized Enterprises (SMEs) because they reduce the scale economies for professional training. While previously only larger firms could afford to hire high-quality trainers or purchase expensive training software packages, today employees of SMEs can access similar high-quality resources and interact with these training providers at a much lower cost.

These benefits have meant that many companies, including SMEs, have invested significant resources in promoting Web 2.0 alternatives to traditional kinds of training (Anderson & Schwager, 2004). However, even though Web 2.0 tools have the potential to provide better services to individuals at a lower cost, these effects will only come about if individuals adopt them widely (Riegner, 2007). This has not been the case (Ajjan & Hartshorne, 2008; Alexander, 2006; Broady-Preston, 2009; Evans, 2008; Kim,

2010), meaning that investments in these tools may be wasted.

Without understanding what encourages individuals to use Web 2.0 tools, we will not be able to act to increase their adoption (Broady-Preston, 2009; Evans, 2008). However, there is a lack of empirical research on this issue (McLean, Richards, & Wardman, 2007). In addition, a review of the existing research on Web 2.0 adoption shows that relatively few studies have studied professionals (Broady-Preston, 2009; Dale, Kinnison, Short, May, & Baillie, 2011; Tu, Blocher, & Ntoruru, 2008; Usher, 2011), and most studies took place in large organizations. As a consequence, little has been written about the factors that influence SMEs to adopt Web 2.0 tools. The current study aims to fill these gaps by conducting field research on Web 2.0 adoption by professionals in SMEs.

Understanding why individuals accept or reject new information technology is one of the most challenging issues in IS research (Ajjan & Hartshorne, 2008), and applies to Web 2.0 tools too. This study aims to understand the factors that affect individual use of Web 2.0 technologies, and the experiences of individuals who have used them. This study asks the following questions:

- What influences their adoption of Web 2.0 tools?
- What influences their decision to continue using these tools if they have already adopted them?

Studies on the user adoption of IT mainly use the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003), while research on continuance intention is usually based on the Expectation Disconfirmation Theory (EDT) (Bhattacharjee, 2001b). We apply both of these models to our context, and extend UTAUT by examining the Digital Literacy (Hargittai, 2005) of users. Digital Literacy (DL) is relevant in this context because it allows us to conceptualize IT use as an evolving skill. In other words, users who are comfortable with IT should take up innovations, such as Web 2.0, much more easily than users who are less savvy with IT.

The objectives of this study are to: a) increase our knowledge and understanding of the use of Web 2.0 tools by professionals working in SMEs, and b) identify the factors that influence the adoption of Web 2.0 tools by professionals.

1.2 Methodology

Choosing a suitable research methodology is an important part in defining the steps to be taken to answer the research objectives and questions (Leedy & Ormrod, 2005, 2009). Combining quantitative and qualitative research methods has received increased attention from IT researchers (Gable, 1994; Kwan & Ding, 2008; Petter & Gallivan, 2004). The use of mixed methods allows a better understanding of the research phenomenon, as multiple research methods increase the validity of the data and results (Bouma & Ling, 2004). Thus, a combination of quantitative (survey) and qualitative (semi-structured interviews) methods was used for this study.

Quantitative methods were used to test the relationships between the variables in the research model and to provide evidence to invalidate or support the research hypotheses (Bernard, 2000; Creswell, 2009; Neuman, 2010; Punch & Punch, 2005). The qualitative data was used to evaluate the validity of the constructs in the research model and to provide a richer understanding of Web 2.0 adoption by professionals. It provided an insight into the challenges facing Web 2.0 tools implementation and was used to validate the findings from the survey.

1.3 Implications

This study contributes to the emerging body of literature on Web 2.0 adoption by empirically validating two widely-used models of IT adoption and continuance in a new context. In addition, the model of IT adoption was extended with by including a new variable (Digital Literacy) to account for the evolutionary aspect of Web 2.0. The study's findings provide researchers and practitioners with guidance to enhance their strategies to encourage adoption of these technologies.

Given that the study took place among SMEs in New Zealand, the findings will help SMEs managers, IT consultants, vendors and government agencies develop guidelines to encourage the adoption of Web 2.0 for e-learning, so as to enhance the competitiveness of New Zealand's SMEs in the global business environment.

1.4 Outline of thesis

This section is a detailed overview of the thesis, and is represented in Figure 1.1.

Chapter 2 (*Research Context*) sheds light upon the environment being investigated, and the roots of the problems posed in the current study. The chapter reviews the literature on Web 2.0 adoption, and identifies significant issues related Web 2.0 adoption, both in NZ and elsewhere and among large firms and SMEs. The chapter concludes by providing information about CPD and its significance among professionals.

Chapter 3 (*Literature review*) reviews the existing models of IT adoption to identify the most appropriate theoretical background for this study, followed by a discussion on DL, and the justification for including it in the models being tested.

Chapter 4 (*Research model and hypotheses*) presents the research model and hypotheses that will be tested.

Chapter 5 (*Methodology*) describes the methodologies used in this study. It first discusses the design of the survey, sample selection, and data collection and analysis. It then describes the qualitative data gathering process: the design of the interviews, sample recruitment, and the strategy employed to analyze the interview data.

Chapter 6 (*Quantitative analysis*) provides details of how the survey data was analyzed, and the results of the analysis.

Chapter 7 (*Qualitative analysis*) describes the data obtained from the interviews, and the findings after analyzing it.

Chapter 8 (*Discussion and conclusion*) discusses the results in detail and presents insights into the findings of the study. This chapter also details the contributions of the research, and its theoretical and practical implication. Finally, it highlights the limitations of the research, and provides directions for further research.

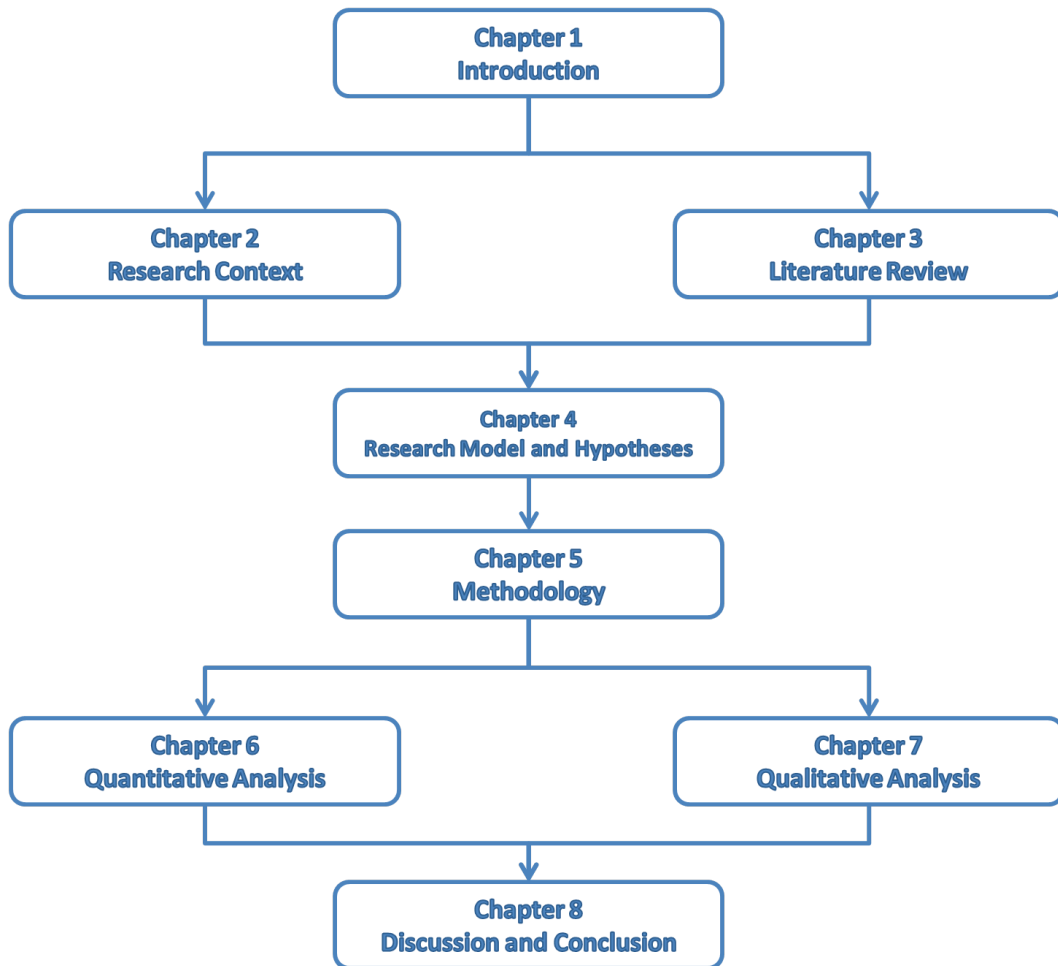


Figure 1.1: Thesis outline

Chapter summary

This is the foundation chapter of the thesis. It provided an explanation why the study was undertaken, the research problem and research objectives raised from previous literature. The implications and objectives were justified. The methodology used to analyze the data was explained, and the thesis outline given.

CHAPTER 2: RESEARCH CONTEXT

2.1 Introduction

This chapter looks at the Web 2.0 phenomenon; both globally as well as from the perspective of SMEs, and CPD. Small and Medium Sized Enterprises (SMEs) are a major source of economic growth for most countries and regions (Taylor & Murphy, 2004). Thus, it is important to understand what drives their adoption of IT because the benefits they gain can significantly impact firms. Since the information-seeking practices of SMEs differ from large firms in significant ways (Buonanno et al., 2005), the factors that drive adoption may differ between small and large firms. Without a better understanding of the differentiating factors that affect the adoption of Web 2.0 innovations, the drive to adopt Web 2.0 tools will not successfully contribute to SMEs' competitiveness (Martin & Matlay, 2001; Poon & Swatman, 1995).

2.2 An overview of Web 2.0

2.2.1 What is Web 2.0?

Tim Berners-Lee, the inventor of the WWW, wanted the Web to be a place for connection where:

“... all the information stored on computers everywhere was linked...all the bits of information in every computer at CERN, and on the planet, would be available to [him] and to anyone else. There would be a single, global information space” (Berners-Lee, 1999, p.4).

The original Web, now known as Web 1.0, did not meet Berners-Lee's expectations. In the early 1990s, Web 1.0 required a fairly-high level of training to publish online. For example, it required an understanding of HTML (Hyper Text Markup Language) (Andersen, 2007; Richardson, 2010). Web 1.0 became a one-way road for communication and a place where the users simply collected information (Rosen & Nelson, 2008). Years later, after the arrival of new technologies, Berners-Lee's ideal read/write Web, now called Web 2.0, has simplified communication and collaboration (Andersen, 2007; Richardson, 2010; Rosen & Nelson, 2008).

The term “Web 2.0” (coined by Darcy Di Nucci) was brought into the public awareness by Tim O'Reilly, a technology-related publisher, and his colleagues at a 2004 conference (Andersen, 2007). O'Reilly's 2005 article, “What is Web 2.0” introduced many people to the ideas behind the coining of the Web 2.0 term (O'Reilly,

2005). According to Wikipedia (www.en.wikipedia.org/wiki/Web2.0), Web 2.0 is:

“A second generation of services available on the World Wide Web that lets people collaborate and share information online. In contrast to the first generation, Web 2.0 gives users an experience closer to desktop applications than the traditional static Web pages.”

O'Reilly has described Web 2.0 as:

“... the network as platform, spanning all connected devices; Web 2.0 applications are those that make the most of the intrinsic advantages of that platform: delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an ‘architecture of participation’ and going beyond the page metaphor of Web 1.0 to deliver rich user experiences” (O'Reilly, 2006).

The definition of Web 2.0 varies by use and subject according to researchers, scholars, students, educators, policy makers, and others (Andersen, 2007; Richardson, 2010; Rosen & Nelson, 2008). A broad definition is that Web 2.0 is the conceptual framework for a web-based platform where individuals are able to use groups of technology tools to create and post content, collaborate on tasks with others, interact in social networks, revise existing content, and share information. In this web-based platform world, users are able to participate and control the content, and the boundaries are limitless (O'Reilly, 2005, 2006). It is new, participatory, open, democratic, free, global, cross-cultural, and unlimited by time zones (Andersen, 2007).

2.2.2 Characteristics of Web 2.0

O'Reilly (2005) states that Web 2.0 tools should be seen:

“As a set of principles and practices that tie together a veritable solar system of sites that demonstrate some or all of those principles, at a varying distance from that core.” (para. 7).

Within the Web 2.0 platform, each individual is able to build and control their own data, collective intelligence is harnessed, services are offered instead of packaged software, and data are able to be remixed and transformed. Google is a good example of this as it continuously releases its software, offering services, and allowing users to manage their data online. Meanwhile, it is serving as a browser, acting as a database where huge amounts of data are collected; and a search engine and server for its users and their online activities. This platform merges various services and keeps its software up-to-

date for end-users connected into and through the Internet (O'Reilly, 2005).

In the Web 1.0 world, a few users who were familiar with HTML could collect and use online data and create a web page. A Web 2.0 world, in contrast, is open to all individuals. There are few obstacles to the use of Web 2.0 technologies, and with basic computer technology skills, most people can offer feedback on blogs, write and edit information on wikis, add tags to images or web pages, and upload photos or podcasts. This active Web environment is open for posting, uploading, creating and publishing contents under users' control (Solomon & Schrum, 2007).

One of the most significant characteristics of Web 2.0 tools is that many Web 2.0 tools are under an open source license (Solomon & Schrum, 2007). Open source supporters "believe that the source code for programs should be available for anyone else to study, use, enhance, and distribute" (Solomon & Schrum, 2007, p.50). All users, including programmers, can contribute feedback to help in the revision and regular upgrading of open source software. The open source software authors are community members from around the world from many cultural backgrounds and nationalities. No-cost does not mean that choice is limited; in fact, there are many choices among open source software, such as Moodle, Mozilla Firefox, and the sound editor Audacity.

2.2.3 Web 2.0 tools for professionals

Web 2.0 applications depend on interaction with individuals. They are used to build collaboration between individuals/users who actively participate by sharing their experiences, information, knowledge and feedback. For example, sites such as Facebook (<http://www.facebook.com>), LinkedIn (<http://nz.linkedin.com>), YouTube (<http://www.youtube.com>) and MySpace (<http://www.myspace.com>), help individuals keep in touch with each other, share information and sell goods and services.

Various Web 2.0 applications are available in different formats, such as wikis, blogs, RSS, podcasting, and social networking. They have a range of characteristics and have led to the creation of various Web 2.0 communities. The next section articulates the use of different Web 2.0 formats and provides an overview of current and emerging business models

2.2.3.1 Wiki

Wikis are web pages that can be created and edited by their users by using any web browser. Wikis support hyperlinks and have simple syntax for creating new pages and linking internal pages on the fly, like Wikipedia (<http://www.wikipedia.org>). Wikis can be used to support knowledge management in workplaces (Dave & Koskela, 2009; Kille, 2006). Some wikis has been created for specific interests, such as television trivia (<http://www.tviv.org>), or to design and support personal organizers (<http://www.tiddlywiki.com>). Wikis have also been employed by professionals to interact with their customers or for exchanging information (Boulos, Maramba, & Wheeler, 2006). Thus, wikis are tools that allow people to join together in knowledge-building communities in which people are able to improve their reflective and critical thinking skills (Jonassen, Howland, Marra, & Crismond, 2008). The revision capability is one of the most distinctive functions of wikis- it allows people to review previous versions of a page, revise or revert to the version they prefer, compare thoughts from different participants and practice social negation without social presence (Hemmi, Bayne, & Land, 2009).

Examples of wikis for professionals are: a) FileTube (www.filestube.com/p/professional+wikis), which provides updated information for professionals worldwide; b) Omega wiki (www.omegawiki.org/planned_Wikis_for_Professionals) (Figure 2.1) designed for patient support; and c) Accounting Wikia (http://accounting.wikia.com/wiki/Accounting_Wiki) which allows accounting professionals and practitioners to publish their articles on the site. Small businesses can also use a wiki-sourcebook to create wikis (smallbusiness.com/wiki/Directory:Accounting).

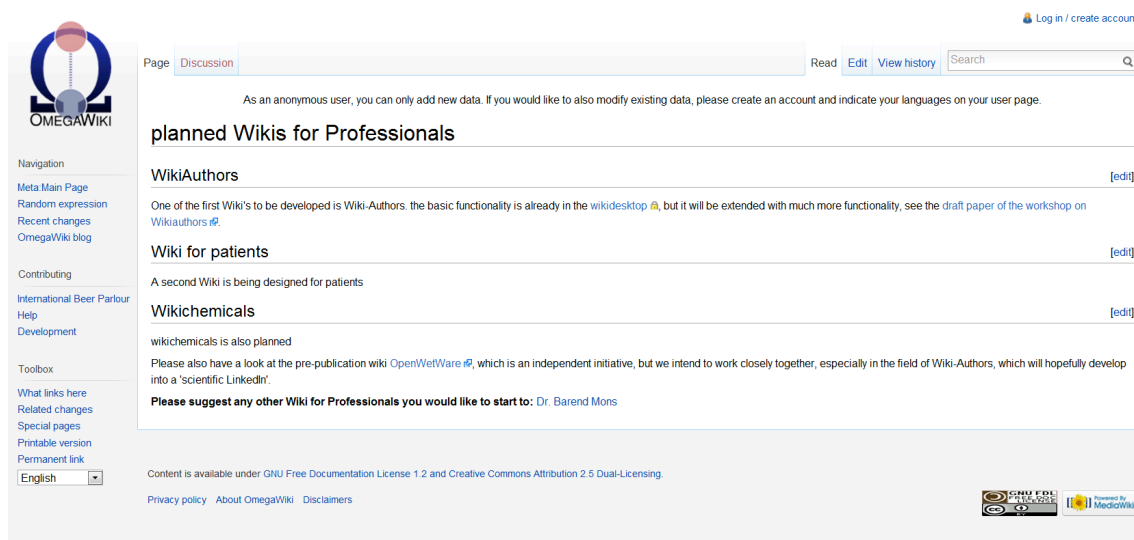


Figure 2.1: Example of a Wiki

2.2.3.2 Blog

The word “blog” is short for web log. Blogs are frequently-updated websites on particular themes (such as education, business, accounting, and health), and are usually published by individuals (see Figure 2.2). A blog can bring together individuals with common interests to form networks of contributors, who together formulate knowledge founded in the experiences of the network itself (O'Reilly, 2005). The posts (articles) on blogs are usually (but not always) written by one person, and other individuals are encouraged to comment on these posts. Blogs can consist of images, text, and multimedia files (Blood, 2004; Nardi, Schiano, Gumbrecht, & Swartz, 2004; Vogel & Goans, 2005).

A blog is an effective way for transferring knowledge from an individual to others. This includes knowledge among professionals, and various blogs have appeared for each profession. For example, blogs in the field of accounting include “The Analyst’s Accounting Observer” (www.accountingobserver.com/blog/), which tracks accounting issues in the news, and “Inside Sarbanes-Oxley” (www.insidearbanesoxley.com) on internal auditing issues.

Moreover, since blogs allows discourse rather than extended monologues or other traditional methods of learning, users are provided with opportunities to engage keenly in a socially constructed learning process relevant to CPD (Santy & Smith, 2007). Blogs are also useful for improving writing skills and engaging in collaborative learning (Blood, 2002; Downes, 2004; Du & Wagner, 2007; Kaplan, Piskin, & Bol, 2010; Richardson, 2010).

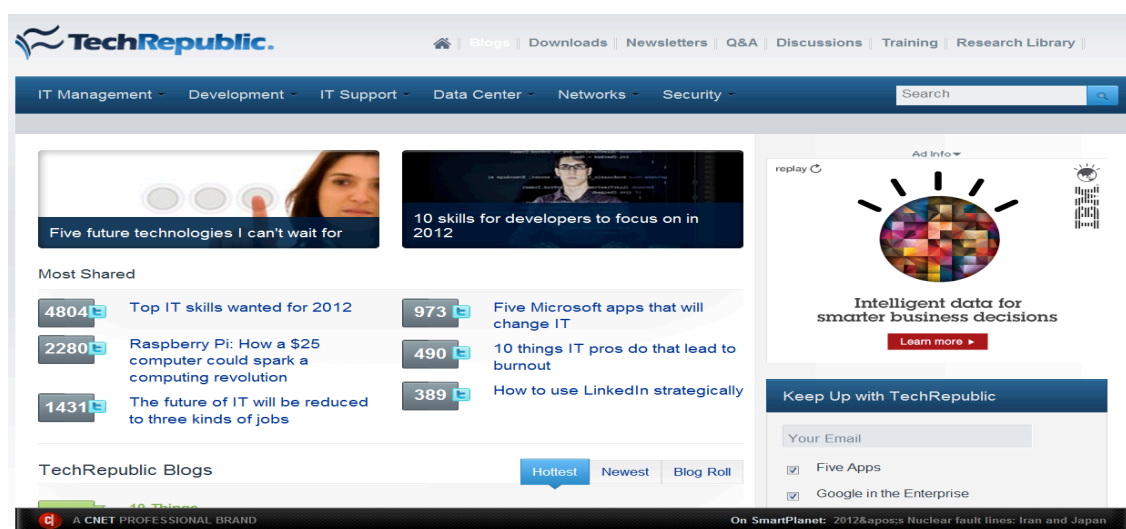


Figure 2.2: Example of a Blog

2.2.3.3 RSS

RSS (Real Simple Syndication) (see Figure 2.3) is an Extensible Markup Language (XML)-based data format that allows users to discover updates to the content of RSS-enabled websites. RSS can also stand for “rich site summary” (Duffy & Bruns, 2006), because it enables users to obtain news and commentaries from authors directly as soon as they are published, negating the need for intermediaries. Thus, users can stay up-to-date with an enormous amount of new information without having to visit surfing numerous websites every day. RSS “feeds” can be easily set up and work automatically without having to verify settings (Duffy & Bruns, 2006). Wikipedia (<http://en.wikipedia.org/wiki/RSS>) describes RSS as:

“A family of Web feed formats used to publish frequently updated digital content, such as blogs, news feeds or podcasts.”

Readers obtain updates on websites immediately by signing up to the RSS feed of a site or blog. RSS feeds can be obtained and deciphered with help of feed readers, which keep readers updated on new posts. RSS allows users to create and compose their daily news package individually according to academic disciplines, personal and professional interests.

The screenshot displays the website for Graham Sunley & Co., Chartered Certified Accountants & Registered Auditors. The header includes the company logo, name, and contact information: "For friendly, personal service & impartial advice" and "Call 01904 528 100". A navigation bar contains links for Home, Services, About Us, News, and Contact Us. The main content area is titled "RSS Feeds" and explains that RSS allows users to see when sites have added new content. It mentions that users can get the latest headlines and articles (or even audio files, photographs or video) in one place, as soon as they are published, without having to remember to visit each site every day. It states that it takes the hassle out of staying up-to-date by showing the very latest information that the user is interested in. Below this, it says "Our RSS feed" and "This website contains the following RSS feed:". A list follows with "1. Latest News". A link for "Further Information" is provided. At the bottom, it says "For further information on RSS feeds please see the following websites:". On the right side, there is a sidebar titled "FEATURED SERVICES" which lists three categories: "Accountancy" (Preparation of Sole Trader, Partnership and Limited... Read more), "Audit & Assurance" (Completion of Statutory Company Audits, Independent... Read more), and "Taxation" (Personal Tax Return completion, P11D preparation,... Read more). Below these, there is a section for "Business Planning & Forecasting" (Preparation of Cash Flow Forecasts and Budgets including... Read more).

Figure 2.3: Examples of RSS Feeds

2.2.3.4 Podcast

Podcasts originated from the widespread use of Apple's iPod music player in the mid-2000s, and is a conjugate of "iPod" and "broadcast" (see Figure 2.4). Podcasts refer to the sharing of multimedia files over the Internet. Podcasting is akin to TV on-demand or radio. Listeners can select the place, time, and content to listen to a program (Campbell, 2005; Frydenberg, 2006; Harris & Park, 2008), rather than having to listen or view it when it is being broadcast.

Podcasts have been used in CPD to create a collaboration framework among students. For example, members of the NZ Institute of Chartered Accountants (NZICA), who require continuing education credits to renew their license, can use NZICA's podcasts (www.nzica.com/podcasts.aspx) to acquire these credits.

The screenshot displays the 'Easy Accountancy' website, which is a platform for chartered tax advisers and accountants. The header features the company logo and three key service highlights: 'from £30 + VAT per month', 'All-inclusive, fixed-fee accountancy for freelancers & sole traders', and 'Unlimited access to your accountant with no extra charges'. A navigation bar includes links to Home, About Us, Our Services, How to?, Small Business, Self Employed, Free Resources, News, and Contact Us. The main content area is titled 'LinkedIn Video Podcast for Contractors' and includes a link to the video cast: http://www.sjdaccountancy.com/about/linkedin_for_contractors.html. The text explains that the podcast is designed to help contractors maximize their use of LinkedIn, a platform with over 90 million users. It also mentions that the podcast was created by Bright Beehive, a social business expert. The website features several sidebars with additional resources, including 'Free Guides', 'Sole Trader or Limited', 'Freelancer FAQ's', 'Freelancer & Sole Trader Calculator', and 'Developing your business'. A 'Related guides' section lists topics like 'Improving productivity', 'Growing the top line with a marketing audit', 'E-commerce - legal obligations', 'Handling e-mails - reduce the stress levels', and 'Ensuring proper virus protection'. A 'Related news' section is also present. On the right side, there are three orange buttons: 'Ask us a Question...', 'Quote me!', and 'Become a client'.

Figure 2.4: Example of Podcasts

2.2.3.5 Social networks

Social networks are online communities that connect people with similar interests (Mason & Rennie, 2008) so that they can communicate with each other and obtain/pass knowledge to others. Examples include Facebook (<http://www.facebook.com>), which is for general interests, and Café Mom (<http://www.cafemom.com>), which provides advice and information to mothers. Although social networking sites are most popular for personal socializing, they are also used in educational and professional settings such as professional communities and cross cultural language learning communities (Gray, Thompson, Clerehan, Sheard, & Hamilton, 2008).

For example, LinkedIn (<http://www.linkedin.com>) (shown in Figure 2.5) is used to exchange information about careers. Social networks for professional accountants include Accounting Networks (<http://www.accounting-networks.com>), ARNE (<https://cs.thomsonreuters.com/community>) and Accountants' World (<http://www.accountantsworld.co.uk>). These social networks are an avenue for professionals to discuss challenging cases, share professional insights, and learn techniques to improve their workplace performance, job and customer satisfaction.

The image is a screenshot of the LinkedIn homepage. At the top, the LinkedIn logo is on the left, and navigation links 'Home', 'What is LinkedIn?', and 'Join Today' are in the center. On the right, there are input fields for 'Email' and 'Password', and a 'Sign In' button. Below the navigation bar, the main content area is split. On the left, a blue banner reads 'Over 150 million professionals use LinkedIn to exchange information, ideas and opportunities'. Below this are three icons with text: 'Stay informed about your contacts and industry', 'Find the people & knowledge you need to achieve your goals', and 'Control your professional identity online'. On the right, a 'Join LinkedIn Today' box contains input fields for 'First Name', 'Last Name', 'Email', and 'Password' (with a note '6 or more characters'). There is a green 'Join Now' button and a link 'Already on LinkedIn? Sign in.' Below this, a search bar says 'Search for someone by name:' with 'First Name' and 'Last Name' input fields and a 'Go' button. Underneath the search bar, it says 'LinkedIn member directory: a b c d e f g h i j k l m n o p q r s t u v w x y z more' and 'Browse members by country'. At the bottom, a fine print line states: '* By clicking Join Now or using LinkedIn, you are indicating that you have read, understood, and agree to LinkedIn's User Agreement and Privacy Policy.' The footer contains a 'Help Center' link and a list of other links: 'About', 'Blog', 'Careers', 'Advertising', 'Recruiting Solutions', 'Tools', 'Mobile', 'Developers', 'Publishers', 'Language', 'LinkedIn Updates', 'LinkedIn Answers', 'LinkedIn Jobs', 'Jobs Directory', 'Company Directory', 'Events Directory', 'Groups Directory', 'Skills Directory', and 'Service Provider Directory'.

Figure 2.5: Example of Social networks

2.3 Significance of Web 2.0 for professionals

Although many professionals might not pay much attention to trendy websites or spend time sharing their videos, music, and pictures, the following features of Web 2.0 tools can have a significant effect on their working lives:

- Corporate information systems are becoming more complex because firms are integrating business applications from varied and multiple systems. Data is also being generated from many sources and integrated. To use a Web 2.0 term, organizations are progressively “mashing up” data and applications to provide easier access and better information to individuals. For instance, many organizations’ information systems’ have already integrated data from their own ERP (Enterprise Resource Planning) systems, their vendors’ systems, and their customers’ feedback.
- The web is being used as a platform to collaborate and share information in numerous new ways. Web 2.0 tools are becoming forums for contributing ideas, discussing problems, and providing solutions. These services have become popular because they are useful- users can interact with each other- and these advantages become even more powerful when more users use them because of network effects.
- Web 2.0 offers a new kind of web with a much improved user interface. Instead of hyperlinked pages that require users to shuffle from one page to another, pop-up windows can display information and disappear when no longer needed. These improvements rely on technologies such as AJAX (Asynchronous JavaScript in XML) that allow the web browser to display data more effectively and efficiently (Tu, Blocher, & Ntoruru, 2008).

These developments matter for business professionals at three levels. First, organizations are changing the way they do business by using Web 2.0 tools- they have greater access to data and can manipulate and analyze it much more easily. Business professionals need to know how to integrate these tools into their work processes so that they become more effective, especially in terms of monitoring and data access. Second, professionals can use these tools to exchange information with their peers in the same profession in other firms. Last, they can use Web 2.0 tools as part of their e-learning toolkit to update their knowledge and develop their professional skills.

2.4 Web 2.0 in New Zealand SMEs

Many New Zealand (NZ) firms use the Internet to sell their services and products. Studies show that there are a large number of active Internet users in NZ, perhaps due to the fact that New Zealanders have easily adopted new technologies (Cameron & Massey, 1999). SMEs are viewed in NZ as sources of innovation and flexibility, and make a major contribution to its economy, both in terms of the number of SMEs and the proportion of the labor force employed by these companies. The importance of the SME sector in NZ is increasing as large companies downsize to compete in the international markets, workers face less job security, and more individuals turn their hands to small businesses at retirement or as a lifestyle choice.

For the purposes of this study, an SME is defined as an enterprise with 30 or fewer employees, which is generally managed by the owner. SMEs are usually not part of larger businesses or a group of companies with access to managerial expertise. As in many other economies, most firms in New Zealand are small and medium-sized, with 97% of all firms employing 30 or fewer employees (Peursem & Jiang, 2008).

With more opportunities presented by technological development and globalization, the role of SMEs seems to be expected to continue to enhance in the coming years (Cameron & Massey, 1999). NZ's SMEs form an important component of the economy's output (37%), both in terms of the number of companies (97%) and account for up to 70% of employment (Deloitte, Touche, & Tohmatsu, 2008). In addition, a survey conducted by CPA Australia Ltd in 2011 indicated that: "(the) IMF's forecast for New Zealand's GDP growth is 2 per cent for 2011 and 3.7 per cent for 2012. This positive growth forecast is reflected in the relatively neutral-to-positive expectations that many New Zealand small businesses have on the economy" (CPA Australia Ltd, 2011, p.7).

A survey by Deloitte, Touche, & Tohmatsu revealed that although the adoption rates for Internet presence was high, limited Internet based learning was conducted and the forecast growth for Web 2.0 usage by professionals and organizations was quite vague (Deloitte et al., 2008). However, a more recent study indicates that there is an increase in organizational adoption of Web 2.0 tools. In 2011, social networking sites (see Figure 2.6) made the biggest gains and increased their lead over other popular Web 2.0 technologies such as blogs and video sharing. Seventy-two percent of participants said that their organizations used at least one social technology. Participants also state that

their companies use Web 2.0 technologies (social tools) to improve their understanding of external environments, find out new ideas, and manage projects and employees. Participants state that different Web 2.0 tools are beneficial for different processes (McKinsey, 2011).

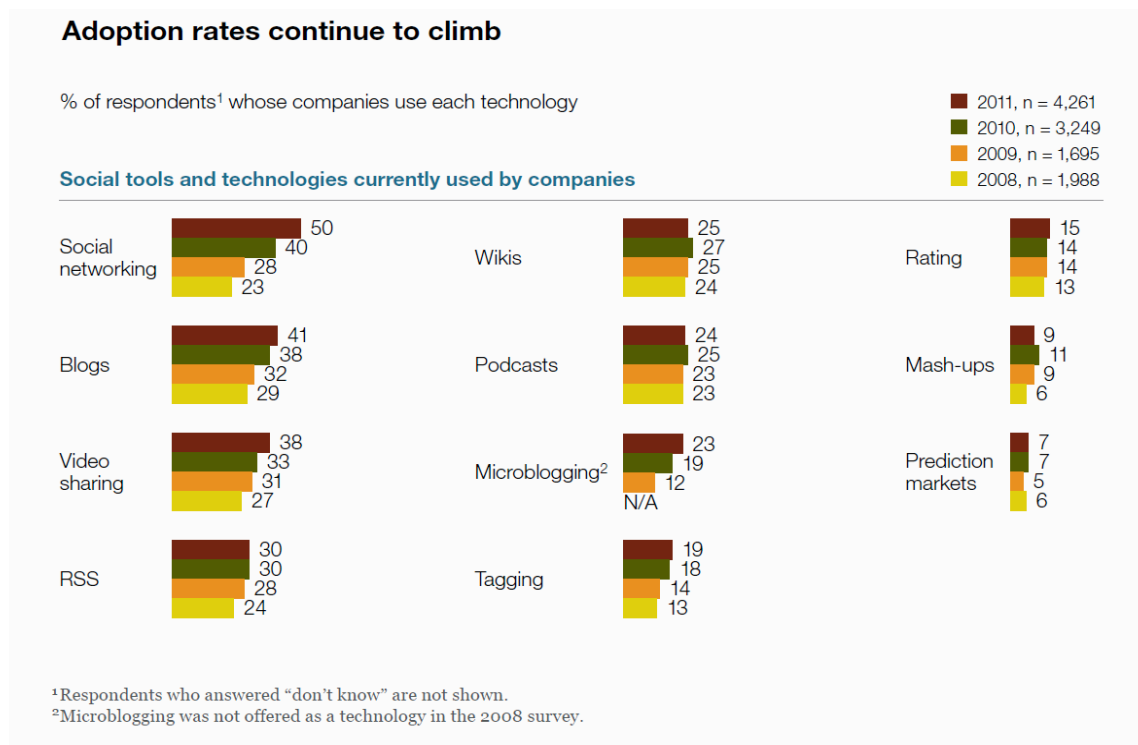


Figure 2.6: Adoption of Web 2.0 Tools

(From: *The networked enterprise holds steady: McKinsey, 2011, p. 2*)

The Deloitte, Touche, & Tohmatsu, and CPA Australia surveys also pointed out that large firms, particularly those in the financial services sector, were more likely to view Web 2.0 tools as being of strategic importance compared to SMEs. This indicated a lack of awareness among SMEs of the possibilities inherent in these innovations.

2.5 Adopting Web 2.0 in SMEs – the challenges

While many organizations recognize the benefits of using Web 2.0 tools, their adoption can be challenging. The Deloitte, Touche, & Tohmatsu, and CPA Australia surveys found that the barriers for Web 2.0 tools usage included a lack of knowledge and skills, cost, a lack of organizational direction, and the low level of management skills among many small businesses (CPA Australia Ltd, 2011; Deloitte et al., 2008).

Thus, efforts to encourage SMEs to use Web 2.0 tools need to consider their characteristics to understand how Web 2.0 tools are actually used by them. In general, the SME sector is very dynamic. However, although many new enterprises start each year, only 40% of them survive for ten years (Levy & Powell, 2004). This is partly due

to the management structure of these enterprises: SMEs are strongly influenced by the personality of their owner and his/her attitude towards doing business (Levy & Powell, 2004; Masurel, Montfort, & Lentink, 2003): as Burns commented, “a real small firm has two arms, two legs and a giant ego” (Burns, 2001, p.67). In addition, because they have limited resources, their business strategies often focus on survival, instead of growth (Levy & Powell, 2004).

Often, IT applications are adopted with a short-term perspective, meaning that IT is used for day-to-day operations rather than to support management activities, such as planning or monitoring market trends. As SMEs generally lack IT expertise and capacity, their owners are the usually the only ones with the authority and (limited) knowledge to identify IT opportunities and invest in them. Implementing and applying of IT in a business depends strongly on its owners’ personality, skills and experiences (Levy & Powell, 2004; Street & Cameron, 2007).

While SMEs use the Internet heavily, their adoption of Web 2.0 tools varies widely. Their Internet use has a very clear functional focus: they use it to access information, communicate with their suppliers and customers, and carry out transactions, such as banking or placing orders. From that perspective, Web 2.0 tools have limited use for SMEs because they are not intended for such operational processes. This lack of fit with their needs means that they are also unwilling to adopt Web 2.0 tools because they will not be able to assess and evaluate their benefits easily. Finally, some SMEs are put off by the risks of using Web 2.0 tools internally (e.g. legal risks because of employee abuse) (De Saulles, 2008a, 2008b).

2.6 Adopting Web 2.0 in SMEs – the benefits

On the other hand, the use of Web 2.0 technologies facilitates communication within firms. Web 2.0 tools such as wikis are useful for writing documents collaboratively, because all employees can insert, delete, or edit the content (West & West, 2009). Employees can declare their level of competence on a particular process or technology so that employees who need help will know who to contact. Such internal collaboration benefits companies since it helps employees share important information and their expertise with each other. Such collaboration often improves the work climate, and good relations in an organization can themselves be a competitive advantage.

Since Web 2.0 technologies are participatory, decentralized, linked and emergent, they can also facilitate innovation processes since employees can collaborate efficiently and professionally (Vapola, Tossavainen, & Gabrielsson, 2008). Web 2.0 tools also provide companies with opportunities to create external networks where they can receive feedback from their partners, stakeholders, and customers. The use of such collaboration networks can thus support innovation, possibly helping organizations gain a competitive advantage (Chesbrough, 2003; De Wit & Meyer, 2010; Seybold, 2006).

Thus, the major organizational benefits from adopting Web 2.0 tools include an enhanced reputation, improved knowledge-sharing, higher employee commitment and engagement, and greater staff efficiency and productivity (Dawson, Hough, Hill, Winterford, & Alexandrov, 2009).

2.7 Web 2.0 user adoption studies

Researchers have begun examining the factors that influence the adoption of Web 2.0 tools. Although the details of these studies are presented in the next chapter (Section 3.3), their key findings are that adoption is influenced by technological issues, social influence, performance expectancy, trust, satisfaction and effort expectancy.

2.8 Web 2.0 and Continuing Professional Development (CPD)

CPD is a method by which professionals can continue to learn and develop throughout their careers, thereby keeping their knowledge and skills up to date in order to work effectively. Thus, it relies on a community of individuals with similar interests and stresses the timely dissemination of knowledge. Web 2.0 tools can help in both aspects.

Web 2.0 tools bring together individuals with common interests to share and formulate knowledge founded in their experiences (O'Reilly, 2005). They facilitate interaction and collaboration, offer opportunities for immediate feedback, create communities, and harness collective intelligence with no associated costs (Andersen, 2007; Solomon & Schrum, 2007). With Internet connectivity, people can easily modify these tools to meet their personal interests and needs.

The use of Web 2.0 for learning may be attractive because it is flexible enough to meet individual learning needs, can help develop critical thinking skills, provides an alternative learning environment by expanding learning outside the classroom, and can prepare users for lifelong learning (Lemke, Coughlin, Garcia, Reifsneider, & Baas, 2009). In addition, Web 2.0 tools allows discourse rather than concentrating on

extended monologues or other traditional methods of learning, users/professionals are able keenly to engage in a socially constructed learning process relevant to CPD (Santy & Smith, 2007).

2.8.1 Web 2.0 and e-learning

E-learning can be defined as “the use of computer network technology, primarily over or through the Internet, to deliver information and instruction to individuals” (Welsh, Wanberg, Brown, & Simmering, 2003, p.246). ICT has provided many mechanisms for supporting learning and e-learning is seen as the new model for modern education, particularly for SMEs.

These days, the Internet has become the core platform for e-learning: it places the learner at the center and encourages communication, informal consumption, and knowledge creation and sharing. These trends have accelerated with the emergence and use of Web 2.0 tools. With sharing, networking and collaboration embedded in them, Web 2.0 tools are altering users’ activities and relationship with knowledge and information (Tu, 2004; Tu, Blocher, & Roberts, 2008).

Web 2.0 tools have been widely used to enhance communication and knowledge transfer in virtual learning environments, and have made training more efficient and effective (Aczel, Peake, & Hardy, 2008). One reason for this is that they support the conception of learning as a behavior that takes place in an organizational and social context, not only within individuals’ (Moon, Birchall, Williams, & Vrasidas, 2005; Tynjälä & Häkkinen, 2005).

2.8.2 e-Learning at the workplace

Workplace learning refers to training or learning undertaken in the workplace (Craig, 2007). Workplace learning is the means, process, and activity by which an employee learns in the workplace, from basic skills to high technologies and management practices that are immediately applicable to an employee’s job, duty, and role (Evans & Fuller, 2006).

The increased intensity of competition, industrial changes, and globalization has led companies to look for new ways to develop and improve their competitive advantages. Continuous innovation has become a key objective, and to achieve it, knowledge is seen as the central resource with learning as an essential process. This has led to a greater emphasis on studies of workplace learning, especially because of the increasingly

important role played by professional skills and expertise in organizational developments (Derouin, Fritzsche, & Salas, 2005).

2.8.3 Continuing Professional Development (CPD)

In today's society, individuals base their self-esteem on their work and increasingly find that their satisfaction and identity comes from their profession (Mott, 2000). Mott states that education is becoming an increasingly essential factor in individuals' lives, especially in the workplace. Grotelueschen (1985) describes the educational participation of professional workforces as involvement in a formal education activity that is typically short-term, part-time, or both. Educational institutions, professional associations and societies, professional service agencies, the government, and other organizations provide CPD activities (Grotelueschen, 1985).

The distinction between CPD and continuing education in general relates to the benefits received from the educational experiences, the nature of the participation, and the characteristics of the referent population (Grotelueschen, 1985). Lifelong education is a learning experience that prepares an employee for future positions, while training is education employees receive to improve their performance on their present job (Spears & Parker, 2002). Training is essential for organizations to become more effective and to enhance their productivity.

2.8.3.1 What is CPD?

CPD refers to any activities engaged in by qualified professionals through which they continue to develop professionally (Ryan, 2003) by "improving (their) professional competence and practice" (Mott, 2000: p.23). Through CPD, professionals enhance their existing skills as well as pick up new skills and knowledge. It is not exclusively about formal qualifications or courses (though these can be a key element of CPD), and may comprise development in both non-technical and technical areas. CPD includes a number of activities such as work experience, open learning, private study, and many more (Martin & Madigan, 2006).

2.8.3.2 Why is CPD needed?

Employees carry out CPD because of the need for professional advancement, personal fulfillment, skill development, and collegiality (Grotelueschen, 1985). Although professions that require licensure and certification make use of CPD more frequently, CPD is growing in size, stature, and coherence for many professions (Cervero, 2000). One reason for this is greater employment instability. The increased use of temporary

employees, consultancy engagements, and short-term contracts has meant that individuals need to take greater responsibility for their own careers to maintain their employability. CPD has also become a more prominent aspect of the workplace environment because of the increase of research-based knowledge, rapid societal changes, and spiraling technological innovations (Cervero, 2000).

Professionals also recognize the need to continually update their skills and knowledge. Their initial training cannot provide all the skills and knowledge that they need to be successful in their career. Most professionals would want to specialize, receive promotions and move into managerial positions during their careers, or develop the skills and knowledge needed to succeed in the context of changing technologies and markets (Broady-Preston, 2009; Brosnan & Burgess, 2003; Ryan, 2003).

Continuing employment is the main motivation for individuals/professionals to get involved in CPD. The job market is continually growing, and individuals/professionals need to update their knowledge and skills, and be ready to increase the chance of continued employment. For most professionals, involvement in CPD is required to continue their membership in their professional organizations, which is essential for their professional standing. For sole practitioners, it is important to maintain her/his competence to remain self-reliant and provide professional services (Broady-Preston, 2009; Butler, 2011).

2.8.3.3 What are the benefits of CPD to employers?

Professionally competent employees will boost a firm's public image, which in turn affects their recruitment and their ability to develop relationships with clients. Professional organizations, clients, employers and government benefit from CPD and the resulting continuance, and increasing of the skills and knowledge of the workforce. Professional organizations want to help their members remain competent. In addition, ensuring that only competent individuals are members can boost the reputation of the organization. Clients of professionals require them to have the necessary skills and knowledge to do their job, and CPD helps ensure that. Employers also should have knowledgeable employees so that their business remains competitive. Finally, governments are interested in the benefits that CPD brings to industries, the overall economy, and the population's well-being (Benson, 2004; Brosnan & Burgess, 2003; Butler, 2011).

Chapter summary

This chapter laid out the context of the study. It began with an overview of the Web 2.0 phenomenon and the issues affecting its adoption. While Web 2.0 tools can be a powerful lure for organizations, in terms of improved knowledge sharing, innovativeness, and relationships with stakeholders, SMEs are still lagging in their use compared to large organizations because of challenges such as a lack of knowledge and skills, costs, and a lack of organizational direction. The chapter then discussed the link between Web 2.0 and e-learning, especially for professionals who are working on their CPD to maintain their employability. The next chapter examines the literature on IT adoption and use, which will be used to develop the research model.

CHAPTER 3: LITERATURE REVIEW

3.1 Introduction

This chapter will review the literature on technology adoption to identify the most appropriate model for understanding the factors that affect the adoption of Web 2.0 tools by professionals. It will then discuss recent studies on Web 2.0 adoption. Following that, this chapter will provide an overview of the concept of digital literacy and its relevance for this study. The chapter concludes with a summary.

3.2 Models of Information Technology (IT) adoption

There are various theories about the acceptance and adoption of IT. Some of them are grounded in social psychology and focus on the user's internal decision processes (Davis, 1989; Fishbein & Ajzen, 1975), while others focus on the features of the innovation and on its diffusion among new users (Rogers, 1995). In the following paragraphs, I will discuss these models: Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) I and II (Davis, 1989); (Venkatesh & Davis, 2000), Diffusion of Innovation Theory (DIT) (Rogers, 1962), Expectancy Disconfirmation Theory (EDT) (Bhattacharjee, 2001b) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003).

3.2.1 Theory of Reasoned Action (TRA)

TRA (Fishbein & Ajzen, 1975) argues that an individual's behavior is determined by his/her intention to perform the behavior, and that the intention is a function of his/her attitude toward the behavior and the subjective norms toward that behavior. In terms of IT adoption, TRA posits that a user's decision to adopt a new technology is predicted by his/her intention to do so, and the strength of this intention depends on his/her attitude toward IT adoption and the opinions of other individuals about adopting that technology (i.e. the subjective norms surrounding IT adoption).

3.2.2 Theory of Planned Behavior (TPB)

The TPB model suggests that the main determinants of users' behavior are their attitudes towards the behavior, the level of perceived behavioral control, and the subjective norms around that behavior (Ajzen, 1985). Attitudes toward a behavior refer to users' negative or positive feelings about their performance. Subjective norms refer to users' understanding of the opinions of individuals who are important to them

regarding that behavior, and perceived behavioral control is defined as the perceived ease or difficulty with which the behavior can be performed.

3.2.3 Technology Acceptance Model (TAM) I & II

Davis (1989) adapted Fishbein & Ajzen's TRA to explain technology acceptance and developed TAM. According to TAM, "Usefulness" (U) and "Ease Of Use" (EOU) are the main factors that influence the rejection or acceptance of an innovation by individuals. Davis suggested that if people believed that using an innovation would require little effort, this would improve their perception of EOU, and if people believed that an innovation would enhance their performance, they would perceive it as being useful.

TAM II (Venkatesh and Davis, 2000) extended TAM by including the determinants of the Perceived Usefulness (PU) and Intention To Use (ITU) constructs. The variables that affect PU are divided into cognitive instrumental processes and Social Influence (SI) processes. SI processes are made up of voluntariness, subjective norms, and image, while cognitive instrumental processes consist of output quality, Perceived Ease Of Use (PEOU), job relevance, and result demonstrability (Venkatesh & Davis, 2000).

3.2.4 Diffusion of Innovation Theory (DIT)

DIT (Rogers, 1962) suggests that innovation diffuse when users accept and use new things or ideas. The model describes the determinants of the rate of adoption, the process of innovation adoption, and the various categories of adopters based on their likelihood of adopting an innovation. Rogers (1995) states that the innovation's trialability, relative advantage, complexity, compatibility with existing systems, and observability can explain up to 87% of the variance in the rate of innovation adoption (Rogers, 1995).

The TAM and DIT models are among the most influential models in explaining and predicting innovation adoption and system use. Originating from different disciplines, TAM and DIT are similar in some respects. For example, the relative advantage construct in DIT is often perceived to be the equivalent of the usefulness construct in TAM, and the complexity construct in DIT is very similar to the EOU concept in TAM (Moore & Benbasat, 1996).

3.2.5 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh, et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) (Figure 3.1) to integrate prior research on IT acceptance and use. In this model, Effort Expectancy (EE) and Performance Expectancy (PE) incorporate the constructs of PU and EOU in the original TAM model. UTAUT suggests that, while EE can be important in determining users' acceptance of IT, EOU may become less important over time as users engage with the technology for a sustained period of time. Thus, EOU is expected to be more salient only in the early stages of using IT.

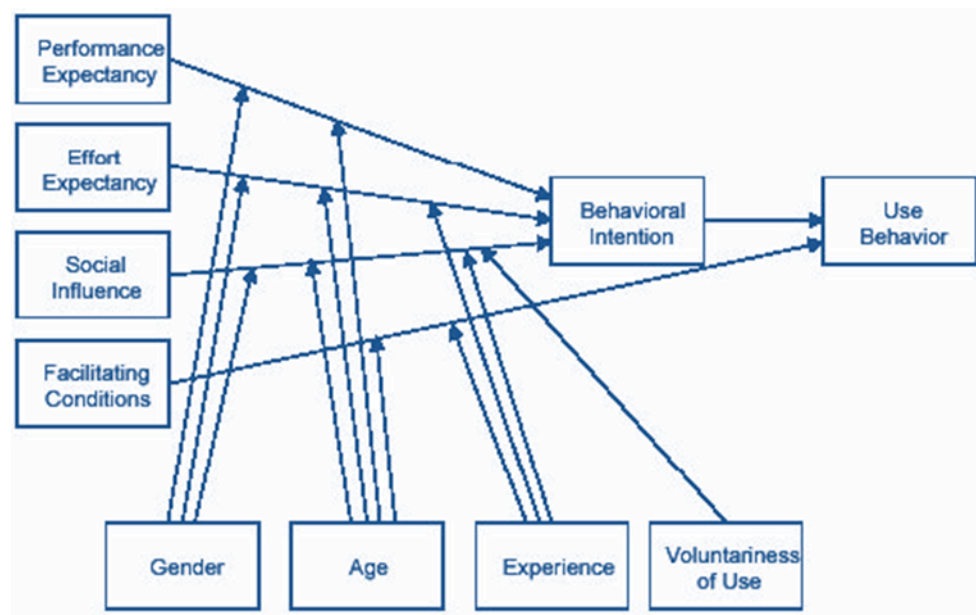


Figure 3.1: Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003)

UTAUT also endeavored to explain how individual differences can influence IT use by proposing that the relationships between PEOU, PU, and ITU can be moderated by gender, age, experience, and voluntariness of use. For instance, Venkatesh, et al. (2003) found that the relationship between ITU and PU varied with gender and age- it was stronger for male and younger employees. The impact of PEOU on usage intentions was also moderated by age and gender, such that it was stronger for older and female employees.

This model was able to explain 70% of the variance in ITU (Venkatesh, et al. 2003), with greater clarity than the TAM model. Thus, UTAUT is being used widely to examine the users' acceptance of the technologies (AbuShanab & Pearson, 2007; AlAwadhi & Morris, 2008; Baltaci-Goktalay & Ozdilek, 2010). Table 3.1 lists the definitions of the constructs as described in the original paper (Venkatesh et al., 2003).

Table 3.1: Definition of UTAUT's constructs and their sources

Construct	Definitions	Source of constructs
Performance Expectancy (PE)	The degree to which an individual believes that using the system will help him or her to attain gains in job performance (p.447).	'PU' from TAM and C-TAM-TPB, 'extrinsic motivation' from MM, 'job-fit' from The Model of Personal Computer Utilization (MPCU), 'relative advantage' from DIT, and 'outcome expectations' from SCT (Compeau & Higgins, 1995; Davis, 1989; Moore & Benbasat, 1996; Moore & Benbasat, 1991; Thompson, Brown, Kay, & Titterington, 1991; Venkatesh et al., 2003).
Effort Expectancy (EE)	The degree of ease associated with the use of the system (p.450).	'PEOU' from TAM, 'complexity' from MPCU, and 'EOU' from DIT. (Venkatesh et al., 2003)
Social Influence (SI)	The degree to which an individual perceived that important others believe he or she should use the new system (p.451).	'Subjective norm' in TRA, TAM2, TPB and C-TAM-TPB, 'social factors' in MPCU, and 'image' in DIT. (Davis, 1989; Moore & Benbasat, 1991; Thompson et al., 1991; Venkatesh et al., 2003).
Facilitating Conditions (FC)	The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (p.453).	'Perceived behavioral control' from TPB, C-TAM-TPB, 'facilitating conditions' from MPCU, and 'compatibility' from DIT (Kirkman, Cornelius, Sachs, & Schwab, 2002; Moore & Benbasat, 1991; S. Taylor & Todd, 1995; Thompson et al., 1991; Venkatesh et al., 2003).

3.2.6 Expectancy Disconfirmation Theory (EDT)

EDT was developed by marketing researchers, who proposed that a customer's to repurchase a service or a product is influenced by his/her prior experience with the service or product (Anderson & Sullivan, 1993; Oliver, 1980). A satisfactory experience is viewed as the main determinant of long-term customer relationships. EDT is widely used in the consumer behavior literature to investigate customer satisfaction and post-purchase behavior, such as repurchase intention and service marketing (Anderson & Sullivan, 1993; Dabholkar, Shepherd, & Thorpe, 2000; Oliver, 1980, 1993; Patterson, Johnson, & Spreng, 1997; Spreng, MacKenzie, & Olshavsky, 1996; Swan & Trawick, 1981).

The theory (Figure 3.2) posits that the key predictor of an individual's willingness to continue with some action is whether his/her expectations about that act were met when he/she first used that good or service. This "Expectation Confirmation" (EC) affects the individual's perception of the good's/service's performance, as well as his/her satisfaction with the good/service (Bhattacharjee & Premkumar, 2004; Spreng & Page, 2003).

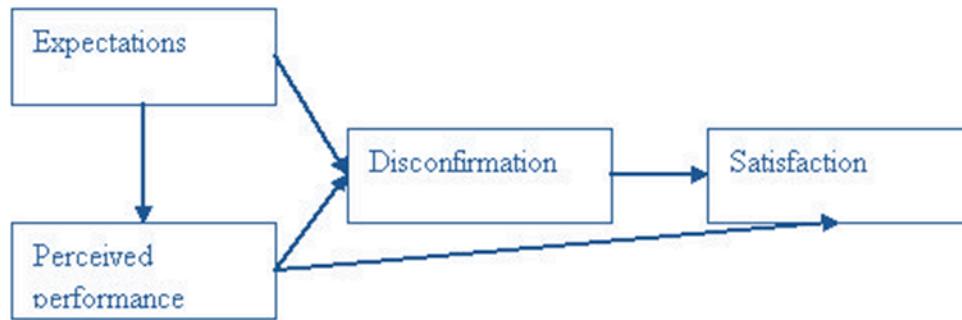


Figure 3.2: Expectancy Disconfirmation Theory (EDT) (Oliver, 1977, 1980)

Bhattacharjee (2001b) applied this model in the IS context, proposing that the Continuance Intention (CI) is similar to customers' repurchase intention because both intentions follow an initial decision (purchase and/or acceptance), are determined by the initial use of IT or products' experience, and could direct to an ex post facto reversal of the initial decisions. In the IT/IS context, EDT has been used to explain user satisfaction with various types of IS systems (Au, Ngai, & Cheng, 2002; Au, Ngai, & Cheng, 2008; Belanche, Casalo, & Flavian, 2010; Bhattacharjee, 2001a, 2001b; Bhattacharjee & Premkumar, 2004; Hossain & Quaddus, 2011; Kim, 2010; Lee, 2010a, 2010b; Limayem & Cheung, 2008; McKinney & Yoon, 2002; Susarla, Barua, & Whinston, 2003; Woodroof & Kasper, 1995).

Bhattacharjee proposed the Expectancy Disconfirmation Model (EDM) by integrating the EDT and the TAM. This model is largely derived from EDT, and the most important distinction is the differentiation between the pre- and post-adoption stages of IT use. Table 3.2 describes the constructs in EDT.

Table 3.2: Definition of EDT's constructs and their sources

Construct	Definitions	Source of constructs
Perceived Usefulness (PU)	The degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989. p.320).	“Relative advantage” from DIT, “PU” from TAM (Bhattacharjee, 2001b; Davis, 1989; Rogers, 1962).
Expectation Confirmation (EC)	When performance is better than expected, then expectations are positively confirmed.	This association comes from adaptation level theory (Helson, 1964), self-perception theory (Bem, 1972), “PU” from TAM (Davis, 1989), (Bhattacharjee & Premkumar, 2004).
Satisfaction (S)	The summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience (Oliver, 1981, p.29).	Initial definition from (Locke, 1976, p.1300), in job performance context from (Oliver, 1981, p.29), in building and retaining a loyal base from (Anderson & Sullivan, 1993, p.160), overall satisfaction from (Spreng et al., 1996).
Continuance Intention (CI)	Willingness to continue to use/purchase a technology/service or product.	“ITU” from TAM II (Venkatesh & Davis, 2000). Behavioral intention from (Mathieson, 1991).

EDT posits that consumers' intention to repurchase products or continue service usages is determined mainly by their satisfaction with their prior use of the products or services (Anderson & Sullivan, 1993; Karahanna, Straub, & Chervany, 1999). Bhattacharjee (2001b) extended EDT to the IS context in three ways. Firstly, while EDT examines both post-consumption and pre-consumption variables, the EDM refers only to post-acceptance variables. The outcome of any pre-acceptance variables is captured within the satisfaction and confirmation constructs. Secondly, EDT studies pre-consumption expectation effects, not post-consumption expectation effects. The EDM revised EDT to include ex post facto expectations. Lastly, expectations are represented by PU, because PU is a cognitive belief salient to IT usage (Davis, 1989). IT continuance intention refers to the beliefs that influence users' intentions across all stages of IT usage (Karahanna et al., 1999).

The preceding sections discussed the common theories that are used to study IT adoption. The key difference between the EDM and UTAUT models is that the latter seeks to explain the initial uptake of a technology, while the former examines what motivates users to continue using a technology after they have started using it. Given that the present study is interested in investigating both the initial adoption decision as

well as the continued use of Web 2.0 tools, both of these models are relevant. The next section looks at prior studies on Web 2.0 adoption and presents their findings, as well as the theoretical perspectives they used.

3.3 Web 2.0 user adoption studies

Recent studies have begun examining the use and adoption of Web 2.0 tools. These studies explore Web 2.0 adoption in different contexts and attempt to identify the factors, which influence the adoption of these technologies by individuals. Table 3.3 highlights the findings from these studies.

Table 3.3: Web 2.0 adoption studies

Study	Objective	Model	Findings/Conclusions
<i>Empirical</i>			
Chiu, Hsu, & Wang, 2006	A quantitative study conducted to investigate the motivations behind people's knowledge sharing in virtual communities. Methodology: a survey of 310 participants in a virtual community of professionals.	Knowledge sharing behavior in virtual communities is influenced by: <ul style="list-style-type: none"> • Trust • Norm of reciprocity • Identification • Shared vision • Shared language • Social interaction ties • Personal outcome expectations • Community-related outcome expectations 	Shared language and trust did not have a significant impact on the amount of knowledge sharing. However, shared vision had a negative and strong influence on the quantity of knowledge sharing. Social interaction ties, reciprocity, and identification increased the quantity of knowledge shared by individuals.
Jackson, Yates, & Orlikowski, 2007	An exploratory case study on a company's use of corporate blogging. Methodology: interviews and a survey	The barriers are: <ul style="list-style-type: none"> • Time • Technical complaints • Not valuing participation (management support) The motivations are: <ul style="list-style-type: none"> • Obtaining and providing information • Social value 	Obtaining information and social value are related to the impact of the technology on individual and organizational performance. Technical issues are related to ease of use, and management support is one aspect of the facilitating conditions in an organization.
Hsu & Lin, 2008	The aim of this study is investigate user adoption of blogs outside the organizational context. It is based on the theory of reasoned action. Methodology: survey.	Adoption is related to: <ul style="list-style-type: none"> • Technology acceptance factors (Perceived usefulness, Perceived ease of use and Perceived enjoyment) • Knowledge sharing factor (Altruism, expected reciprocal benefit, reputation, trust and expected relationship) • Social Influence factor: social norms 	Knowledge sharing is related to social influence.
Payne, 2008	This study used UTAUT to examine the adoption of Web 2.0 by public	The factors considered were: <ul style="list-style-type: none"> • Performance expectation 	The results suggest that intervention strategies designed to increase the intent of public relations

	<p>relation practitioners. Methodology: 338 public relation practitioners were surveyed in two-wave online surveys</p>	<p>(usefulness of blogging)</p> <ul style="list-style-type: none"> • Social influence • Effective technology 	<p>practitioners to accept Web 2.0 tools should focus on PE, SI, and affective components of technology.</p>
Chai, 2009	<p>This study investigates the factors that affect bloggers' knowledge sharing outside the organization. Methodology: survey of 446 students from two large US universities</p>	<p>The adoption factors are:</p> <ul style="list-style-type: none"> • Trust (trust in blogger, trust in information, trust the internet, trust the server provider) • Information privacy concerns • Social ties, gender and reciprocity 	<p>The author argues that privacy is a concern for individual involvement is on the internet. Privacy was not considered to be a relevant issue for the present study because of the CPD context, which meant that the information being shared was professional, not personal, information.</p>
In, Jaekyoung, & Sooyeon, 2009	<p>This research studied the social motivation for using blogs using motivation theory and TAM theory.</p>	<p>The factors studied were:</p> <ul style="list-style-type: none"> • Perceived usefulness • Perceived ease of use • Reciprocity • Social identity • Enjoyment of helping 	<p>Social identity was significantly related to blog use.</p>
Paroutis & Al Saleh, 2009	<p>This study investigated the key determinants of collaborating and sharing knowledge using web 2.0 technologies within organizations. Methodology: A case study was conducted in a technology company.</p>	<p>The determinants include:</p> <ul style="list-style-type: none"> • History • Outcome expectancy • Perceived organizational/management support • Trust 	<p>Certain variables were similar to those in UTAUT:</p> <ul style="list-style-type: none"> • History- related to compatibility; • Outcome expectancy - related to perceived benefits and rewards • Organizational/management support-related to facilitating conditions
Wattal, Racherla, & Mandviwalla, 2009	<p>This study examined the role of socio-demographic characteristics and social networks in blog adoption and usage by employees in a large multi-national corporation.</p>	<p>It focused on</p> <ul style="list-style-type: none"> • Individual characteristics (age, gender) • Organizational factors (managerial adoption) • Social influences (adoption in relational & spatial networks) 	<p>Age was negatively related to adoption, but gender had no significant impact. Usage in spatial networks and managerial influence explained much of the variance in adoption.</p>

Sumak, Polancic, & Hericko, 2010	The study measured how an e-learning technology (Moodle) was used among students. The UTAUT model was used. Methodology: 235 undergraduate students were surveyed.	The factors studied were: <ul style="list-style-type: none"> • Performance Expectancy (PE) • Effort Expectancy (EE) • Social Influence (SI) • Facilitating Conditions (FC) • Attitude Toward Using (ATU) • Behavioral Intention (BI) • Use (U) 	SI and PE had a significant direct effect on ATU, but EE did not. BI is affected by SI, not EE, PE and ATU. Use is determined by FC and BI.
Schoendiens t, Krasnova, Guenther, & Riehle, 2011	The study examined the factors influencing employees' adoption of micro-blogging, and suggested that micro-blogging should be presented to employees as an efficient means of personal brand building, communication, and knowledge management. Methodology: A survey of 82 Twitter users. The participants were asked to imagine that a Twitter-like system was introduced in their workplace.	The factors studied were: <ul style="list-style-type: none"> • Intention to Follow (FLW) • Intention to Contribute (CTB) • Performance Expectancy (PE) • Effort Expectancy (EE) • Signal-to-Noise Ratio (SN) • Communication Benefits (CBE) • Expected Relationships (ER) • Reputation (RE) • Privacy Concerns (PV) • Collaborative Norms (CN) 	PE, PV, CBE, RE, and SN significantly affect micro-blogging usage.
Conceptual			
Bradley, 2007	This Gartner research report describes the factors that motivate firms to shift to an "enterprise 2.0" model from the organizational as well as system viewpoints.	Organizational factors: <ul style="list-style-type: none"> • Purpose of use • Liberty • Authorship • Nurturing (management support) including awareness and reward • Tipping point (critical mass) System characteristics: <ul style="list-style-type: none"> • Structure (user's 	Promoting authorship is important for user adoption. Critical mass (tipping point) refers to the level of community participation, which is similar to social influence.

		<p>facilitators to do the work)</p> <ul style="list-style-type: none"> • Ease of use • Ecosystem (integration of the use of web 2.0 with the daily work process) • Discoverability (easy to discover the content of the system) • Seed (initial content and key participant to start the contribution) 	
Hester & Scott, 2008	<p>The study develops a theoretical model to examine the drivers of the adoption of wikis.</p> <p>The model was derived from the DOI framework and prior studies of wiki adoption.</p>	<p>The motivators for wiki diffusion are user perceptions of wiki:</p> <ul style="list-style-type: none"> • Complexity • Relative advantage • Usefulness for work • Critical mass 	<p>There are two levels of adoption-related factors: organizational and users. For this study, we consider only user-related factors. Critical mass is similar to social influence.</p>
Shumarova & Swatman, 2008	<p>This study investigated the factors that motivate employees to use shadow (informal) collaboration tools (i.e. wiki and blogs) rather than the formal ICT.</p> <p>Methodology: content analysis of the literature on computer supported collaborative work (CSCW) from 1997 to 2008</p>	<p>Adoption was related to:</p> <ul style="list-style-type: none"> • Performance (technology speed and system quality) • Personal satisfaction (perceived behavior controls over using the collaborative tools and communicating or discussing with others) • Affordability (organization's ability to obtain the system) 	<p>Performance and personal satisfaction are related to performance expectancy, while affordability is similar to facilitating conditions.</p>
Torning, 2008	<p>This paper develops a conceptual model and argues that CSCW systems in organization need a new design based on web 2.0.</p>	<p>Adoption was related to:</p> <ul style="list-style-type: none"> • The "time famine" for knowledge workers • A culture of sharing information 	<p>The availability of time can be considered to be similar to effort expectancy, while a culture of knowledge sharing is related to social influence.</p>

The review above shows that most studies on Web 2.0 adoption used the UTAUT model, although some extended it with variables such as privacy, social influence or knowledge sharing. Most of these variables can be subsumed under the existing UTAUT framework, while some, such as privacy, are not relevant to the present study, as it deals with the use of Web 2.0 tools for exchanging work-related information relevant to members of a profession, not personal information. Thus, this study will rely on UTAUT to study the use of Web 2.0 tools.

However, one aspect of the Web 2.0 world that is not captured by these models is the evolutionary aspect of Web 2.0 tools. Using Web 2.0 tools successfully requires users to have good Web 1.0 skills, e.g. searching, collating search results, commenting, and sharing links. These skills can be measured by the concept of *Digital Literacy*. It is likely that users who are uncomfortable with basic web-surfing would be less keen to use Web 2.0 tools, as they require more intense involvement with web browsers and a higher level of online interaction. The next section discusses this concept in more detail.

3.4 Digital Literacy

Literacy is defined as the ability to write and read at an acceptable level of skill necessary for communication (Holdaway, 1979). However, literacy has lately taken on other meanings; for example, researchers have introduced visual literacy, mathematical literacy, and technological literacy. While it might be problematic to measure the degree to which literacy has an impact on an individual's overall happiness, one can easily accept that an increase in literacy would lead to an improvement of the individual's life and society's development (Goodfellow, 2011). Nowadays, we are living in an era, which can be called the digital era, and it is worth clarifying the role of literacy in terms of the digital world.

Gilster (1997) introduced the concept of digital literacy (DL) and defined it as "... the set of attitudes, understanding and skills to handle and communicate information and knowledge effectively, in a variety of media and formats" (p. 17). The term itself had been used over the past decade, but with a narrower meaning- the ability to deal with hypertext information. Gilster's idea was broader, and did not involve a list of certain skills, attitudes, or competencies defining what it is to be digitally literate (Gilster, 1997). He described the concept in general, as the abilities to use and understand information from a wide range of digital sources, and considered it to be basic literacy in the digital age. Thus, it is the modern form of the traditional idea of literacy- the

abilities to write, read and deal with information using the format of time and technology. In the knowledge economy and information society, it is a fundamental life skill (Bawden, 2001; Martin, 2008).

DL is now seen as a broader concept, combining other related literacies, such as information evaluation, knowledge gathering, and a certain understanding (Virkus, 2003). DL in this sense is a framework for integrating several skill-sets and other literacies. Updating these abilities will be necessary, as people's circumstances change and as changes in the digital information environment bring the need for new understandings and new abilities (Markless & Streatfield, 2007). Nowadays, DL includes the ability to use computers, send e-mail, prepare material using computers, search for information on the web, and use other types of electronic technologies. As the use of technology, particularly mobile technology, expands, it is vital that the digitally literate individuals understand the changing world. According to Microsoft's DL curriculum (www.microsoft.com/digitalliteracy), "the goal of digital literacy is to teach and assess basic computer concepts and skills so that people can use computer technology in everyday life to develop new social and economic opportunities for themselves, their families, and their communities."

Today, a definition of DL includes the awareness of what IT can do, combined with the abilities to do tasks, and the ability to work alone and to know when assistance is needed. In summary, it is essential to be comfortable with using technologies, being able to use computers or mobile devices to communicate with one another, both in the work place and home environment, and be aware that technologies are changing and need not be feared.

Why do people need to be digitally literate? According to Smith-Gratto (cited in Huerta & Sandoval Almazan, 2007), people tend believe what they read if it is written in a scientific manner. People often do not use their intelligence – it is easier to Google a second or third time than to remember (Carr, 2008). It is essential that people understand how technologies work and how to use them, or else they might: believe information, which is incorrect, expose their information to others, disclose information by accident, or disclose their systems to hateful attacks. If people believe that pushing a button can provide what they need, what happens if it goes wrong? What happens if people do not know it is going wrong and keep using it, e.g., not perceiving that there are viruses running, using information which is not correct, but believing it. People need to know

and be able to interpret what they find when using technology- “information is not knowledge” (Holmes & Gardner, 2006, p.16). If people do not know where the information is coming from it would lead to believing wrong, incomplete or incorrect information. People may act on incorrect information in their personal and business lives (e.g. while using business analytics application). Thus, individuals need to be able to assess the validity of the data they find. Security can be a key issue in using technologies; people need to know about computers virus program and other forms of malicious software; people need to know when their systems can be exposed to hacking or interception. Digital literacy is beneficial in these ways:

- It increases ICT infrastructure development and use.
- It promotes the adoption of smart ICT and increased productivity.
- Digitally-literate populations are more innovative and creative.
- It promotes economic and social inclusion.
- It promotes and supports empowerment and engagement.
- It helps children and youth mitigate online risk.
- It enables public participation.

On the other hand, what would people miss if they were not digitally literate? Caldwell and Bradley (2009) argued “if users are led to believe that they do not need to spend time learning or developing expertise with the ICT systems that they buy, these users are in fact becoming more detached from the ICT and its influences on the Information Society” (p. 28). They might not take full advantage of or know the advantages of technologies, or may not see opportunities in their business and personal lives. For example, they may lose the opportunities offered by social networking tools to keep in touch with each other, find job opportunities, and make use of learning facilities if they are not familiar with technology.

In order to be included in the information society, individuals have to be digitally literate. This study extended UTAUT by including this concept as a key predictor of Web 2.0 adoption. Digital literacy is particularly relevant in the context of Web 2.0 adoption because it allows us to conceptualize IT use as an evolving skill. In other words, users who are comfortable with IT should take up innovations, such as Web 2.0, much more easily than users who are less savvy with IT. The vision of a knowledge-based society, where economic wealth depends on individuals’ ability to deal with the abundance of information and to adapt to an ever-changing working environment, makes digital literacy a particularly salient concept for examining individual adoption of

IT. Unlike computer self-efficacy (Compeau & Higgins, 1995), which is based on people's perception of their skills, digital literacy focuses on their awareness of important IT-related terms and norms, and is thus a more direct measure of their IT abilities (Hargittai, 2005).

Chapter summary

This chapter reviewed the literature on IT adoption, including studies of Web 2.0 adoption UTAUT (Venkatesh et al., 2003) and the expectation disconfirmation theory (Bhattacharjee, 2001b) are the dominant theories for understanding IT adoption and continued use. This chapter summarized the key factors in the model, and introduced the concept of digital literacy (Hargittai, 2005) as an additional factor worth considering in studies of Web 2.0 adoption. The next chapter presents the research models.

CHAPTER 4: RESEARCH MODEL AND HYPOTHESES

4.1 Introduction

This chapter presents the research models that will be used to study the factors that influence Web 2.0 adoption and continued use.

4.2 Web 2.0 Adoption

To explain professionals' adoption of Web 2.0 tools for their CPD, the study extended the UTAUT model by including digital literacy (Figure 4.1).

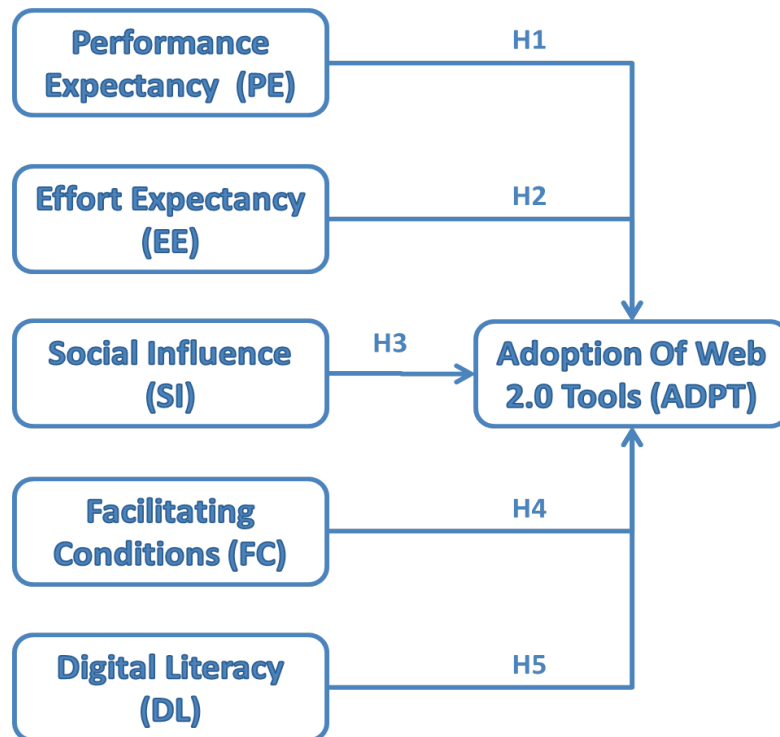


Figure 4.1: Research model for Web 2.0 Adoption (Model 1)

In the context of the current study, adoption refers to the extent that professionals intend to use Web 2.0 for their CPD. Empirical studies have shown that several factors are involved in adopting new technologies (Alan, Annear, Beck, & Van Beveren, 2009; Chia, 2008; Chu & Lu, 2007; Damianos, Cuomo, Griffith, Hirst, & Smallwood, 2007; Grandon, Alshare, & Kwun, 2005; Lim, Trimi, & Lee, 2010). These are discussed in turn below.

4.2.1 Performance Expectancy (PE)

PE is the extent to which users believe that an application enhances their performance. In the context of this study, PE refers to the extent that professionals believe that using Web 2.0 will enhance their performance. Venkatesh et al. (2003) find that PE was a strong indicator of users' intention to use new technologies in organizational context. Empirical studies show support for the relationship between PU and behavioral intention in the context of Web-based learning and e-learning (Mahmod, Dahlan, Ramayah, Karia, & Asaari, 2005; Ong et al., 2004; Saade & Bahli, 2005; Shumarova & Swatman, 2008). Therefore, the following hypothesis is accordingly proposed.

H1: PE will positively influence adoption of Web 2.0 tools.

4.2.2 Effort Expectancy (EE)

EE is to the extent to which users believe that using an application is free of effort. In the context of this study, EE refers to the extent to which professionals believe that using Web-based learning is free of effort. EE relates to perceived ease of use in the TAM model, which assumes that an application that is perceived to be easier to use is more likely to encourage a perception of usefulness and thus an intention to use it. To the extent that higher EE leads to improved performance, EE should have a direct effect on adoption. Studies indicate that PEOU is positively associated with PU and behavioral intention in the context of Web-based learning and technology acceptance (Ong et al., 2004; Saade & Bahli, 2005). Therefore, it is hypothesized:

H2: EE will positively influence adoption of Web 2.0 tools.

4.2.3 Social Influence (SI)

SI is to the degree to which users perceive that important persons believe they should use an application. The concept is similar to subjective norms in the TPB model, which argues that the more favorable the SI of a behavior, the stronger would be users' intention to perform it. According to DIT (Rogers, 1962), individual tends to increase communication with others to understand their IT adoption. Such an increased interaction can influence adoption decisions. Studies show that subjective norms are an important predictor of intention to use an application (Eckhardt, Laumer, & Weitzel, 2009; Hsu & Lin, 2008; Payne, 2008). In the context of this study, SI refers to the degree to which professionals perceive that persons whom they regard as important believe they should use Web 2.0 tools for their CPD. Therefore, the following

hypothesis is accordingly proposed.

H3: SI will positively influence adoption of Web 2.0 tools.

4.2.4 Facilitating Conditions (FC)

FC is to the degree to which users believe that organizational and technical infrastructures exist to support use of an application. In this study, regarding to Web 2.0 utilization, FC is conceptualized as support (technical and non-technical) provided by the company and ease of access to Web 2.0. The following hypothesis is proposed:

H4: FC will positively influence adoption of Web 2.0 tools.

4.2.5 Digital Literacy (DL)

DL is the ability to understand, analyze, assess, organize and evaluate information using digital technologies. DL involves a having knowledge of technologies and understanding how to use them. DL also involves an awareness of the technological services that affect individuals and culture. DL empowers individuals to communicate with others and work more effectively and increase productivities, particularly with those who have the same skills and proficiency (Ferro, Helbig, & Gil-Garcia, 2011). The following hypothesis is proposed:

H5: DL will positively influence adoption of Web 2.0 tools.

4.3 Web 2.0 Continued Use

To explain professionals' continued use of Web 2.0 tools for their CPD, the study relied on the EDT model (Figure 4.2). Continuance intention (CI) is defined in this context as the intention of professionals to reuse Web 2.0 tools for their CPD.

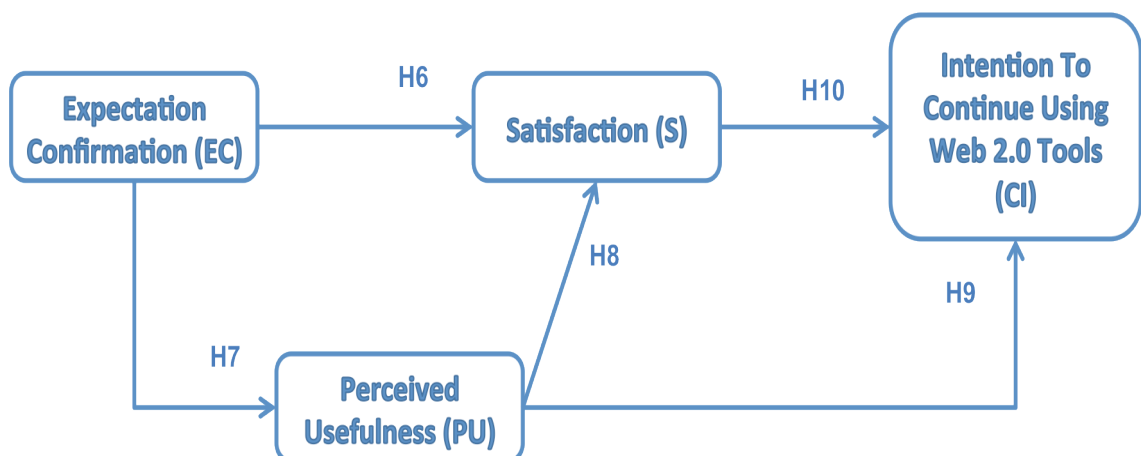


Figure 4.2: Research model for Web 2.0 Continued Use (Model 2)

4.3.1 Expectation Confirmation (EC)

Expectation and confirmation are negatively related, because lower expectations are more likely to be positively confirmed whereas high expectations are more likely to be negatively confirmed (Yi, 1990). Empirical studies in marketing and IS have generally supported this relationship for example; (Belanche et al., 2010; Bhattacharjee & Premkumar, 2004; Kandasamy & Ancheri, 2009; Spreng et al., 1996).

Performance greater than expectations (positive confirmation) generally leads to high satisfaction and vice versa (Spreng & Page, 2003; Yi, 1990). This relationship has been supported in both IT (Bhattacharjee, 2001b; Bhattacharjee & Premkumar, 2004; Hsu & Lu, 2004; Hsu, Chiu, & Ju, 2004; Khalifa & Liu, 2002; Susarla et al., 2003), and marketing (Yi, 1990). In the context of this study, if users find that Web 2.0 tools perform better than expected after using them, their expectations will be confirmed or exceeded and this positive confirmation will increase their satisfaction with these tools. In addition, when their expectations are exceeded or met, users' perception of the usefulness of a technology increases. Therefore, it is hypothesized that:

H6: EC positively influences satisfaction.

H7: EC positively influences PU.

4.3.2 Perceived Usefulness (PU)

Changes in professionals' perceptions as they gain online experience strengthen the usefulness of Web 2.0 tools (Venkatesh, 1999). In the context of this study, perceived usefulness refers to the extent to which professionals believe that using Web 2.0 tools will enhance the ability of the CPD to improve their job performance. When a technology's usefulness increases, users are more inclined to continue using it (Arbaugh & Duray, 2002; Pituch & Lee, 2006). Also, the more useful users find a technology, the more satisfied they will be with it. Therefore, it is hypothesized that:

H8: PU will positively influence satisfaction.

H9: PU will positively influence continuance intention.

4.3.3 Satisfaction (S)

Two definitions by Locke (1976), (in job performance context) and Oliver (1981) (in the context of use) are proposed. Locke defines satisfaction as “a pleasurable or positive emotional state resulting from the appraisal of one’s job” (Locke, 1976, p.1300). Oliver extends this definition as “the summary psychological state resulting when the emotion surrounding disconfirmation expectations is coupled with the consumer’s prior feelings about the consumption experience” (Oliver, 1981, p.29). In addition, in the consumer behavior context, satisfaction is defined as the buyers’ cognitive state of being inadequately or adequately rewarded for sacrifices they have undergone (Howard & Sheth, 1969).

Satisfaction in an IS context (Chin & Lee, 2000; Chiu, Chiu, & Chang, 2007; Chiu & Wang, 2008; Doll, Deng, Raghunathan, Torkzadeh, & Xia, 2004; Doll & Torkzadeh, 1988; Gavrilis, Kakali, & Papatheodorou, 2008; Shumarova & Swatman, 2008) is defined as the affective attitude towards the specific applications by individuals who interact with the applications directly. All of these definitions highlight the psychological states associated with cognitive appraisal of the confirmation (expectation performance discrepancy). That is, lower expectations would result in a higher chance of being confirmed, which in turn positively influence users’ satisfaction and intention to continue. In addition, since individuals focused on knowledge and education may be pleased and satisfied with well-presenting technologies despite having low expectations (Cohen & Houston, 1972; Tse & Wilton, 1988), it is highly likely that users using technologies for such purposes will continue using them once they are satisfied.

In this study, satisfaction is defined as the professionals’ overall affective and cognitive evaluation of the pleasurable level of usage-related fulfillment experienced with the Web 2.0 tools. If professionals are satisfied with a technology, professionals should feel that it will work well in the future, creating a willingness to depend upon it. Logically, professionals who are dissatisfied with Web 2.0 tools will not be as willing to depend on that technology in the future for learning (Ribbink, Van Riel, Liljander, & Streukens, 2004).

This relationship between satisfaction and an interest in being involved in future exchanges with the technology has been supported in prior studies (e.g., Belanche et al., 2010; Chiu, Hsu, Sun, Lin, & Sun, 2005; Deng, Turner, Gehling, & Prince, 2010; Hossain & Quaddus, 2011; Khalifa & Liu, 2004; Lee, 2010a; Spreng et al., 1996;

Spreng & Page, 2003; Susarla et al., 2003; Thong, Hong, & Tam, 2006). Therefore, the following hypothesis is proposed:

H10. Satisfaction will positively influence CI.

The next chapter presents the methodology that will be used to test these hypotheses.

CHAPTER 5: METHODOLOGY

5.1 Introduction

The primary purpose of this chapter is to identify and justify the choice of methodology used to address the research objectives. The current study used a mixed method approach to investigate and identify the factors effecting professionals intention to continue Web 2.0 tools usage. A combination of quantitative and qualitative research methodologies was employed for the current study. The web-based and paper questionnaires were followed by a series of in-depth interviews. This chapter begins with an explanation of research objectives, a discussion on research methods, and a justification for the chosen methodology. Next, details of the survey will be presented: how the questionnaire was developed and designed, how the sample was recruited, and how the data was gathered and analyzed. Following that, the qualitative portion of the study will be presented: how the sample was recruited, how the interviews were conducted, and how the qualitative data was analyzed. The ethical concerns involved in the study will also be discussed.

5.2 Research objectives

E-learning/CPD has been greatly enhanced by the use of Web 2.0 tools, such as blogs, podcasts and wikis, because they enable flexible, learner-centered training. For example, training can be provided “on-demand” to meet the needs of employees who are geographically dispersed or have conflicting schedules. Web 2.0 tools are especially appealing to SMEs, because they reduce the scale economies for professional training. While previously only larger firms could afford to hire high-quality trainers or purchase expensive databases, today employees of SMEs can access similar high-quality resources and interact with these training providers at a much lower cost. However, even though this technology has distinct benefits for SMEs, as it enables them to overcome the challenges of their “smallness”, studies on this topic have mainly focused on large organizations. The current study attempted to fill this gap by examining the use of Web 2.0 tools by professionals in NZ mainly working in SMEs.

We attempted to examine this issue in the context of the use of Web 2.0 tools by professionals. Web 2.0 tools are especially valuable for professionals working in SMEs or operating as SMEs, because they enable them to improve their skills and knowledge much more efficiently. First, instead of having to attend training sessions in person, they

can now obtain the knowledge online and in a much timely manner. Second, the communities created around Web 2.0 tools such as blogs are viable alternatives to the networks found in large organizations. They thus compensate SMEs' professionals for one of the main barriers they face in continuing their education - their lack of access to knowledge and learning networks because of their size. These findings of the current study will help practitioners and researchers better understand the factors hindering and supporting the use of Web 2.0 tools among New Zealand's SMEs, which dominate its economic landscape. This understanding will also help SME managers, IT consultants, vendors and government agencies develop guidelines to encourage the adoption of Web 2.0 tools for e-learning, so as to enhance the competitiveness of New Zealand's SMEs in the global business environment.

The objectives of the study are to identify the factors that lead professionals to:

- ✓ Adopt Web 2.0 tools, and
- ✓ Continue using these tools if they have already adopted them.

5.3 Research methodology and justification

Creswell (2009) states that quantitative methods are those that focus on capturing frequencies and numbers. Data collected by quantitative methods provides information, which is easy to analyze statistically to generalize respondents' explicit/implicit claims, and is fairly reliable. Moreover, with a limited amount of time for conducting the current study, the quantitative questions are easy for respondents to answer and understand and the data is simpler to interpret (Dillman, 2007). However, the quantitative method is criticized for not providing an in-depth description of the phenomenon under investigation. In contrast, qualitative methods are concerned with describing the meaning of a phenomenon under investigation. Although qualitative methods are also criticized regarding their validity and reliability, they provide much richer and deeper descriptions than quantitative methods (Creswell, 2009).

Therefore, the current study applied a mixed method approach (Creswell, 2009), by combining qualitative and quantitative research methods. Tashakkori (2006) defines "mixed method studies are those that combine the qualitative and quantitative approaches into the research methodology of a single study or multiphase study" (Tashakkori, 2006, p.17-18). Johnson and Turner state that methods should be mixed such that their strengths complement each other and their weaknesses do not overlap (Chapter 11, cited in Tashakkori & Teddlie, 2003). An investigator-led mixed method

(Denzin, 1970) and a sequential confirmatory strategy (Creswell, 2009) were adopted in this study. The qualitative was used to deepen the understanding of the phenomenon, and surface novel ideas, while the quantitative method (survey) was used to test the relevance of an existing model, that had been adapted by including a new construct. Interviews (qualitative method) were selected as to develop a holistic and in-depth understanding of the research phenomenon (Teddlie & Tashakkori, 2009). The used of interviews would prevent the study from possibly misrepresenting the phenomenon, and help ensure the validity and reliability of the data collection (Locander, Sudman, & Bradburn, 1976). Interviews help researchers probe participants for clarity or for more detailed information when needed. Overall, the rationales for the mixed method approach for the current study are: 1) an ability to extract adequate information from the underlying data collected (representation), 2) ascertain the validity of the data interpretation (legitimation) (Kaplan & Duchon, 1988; Onwuegbuzie & Teddlie, 2003). Additionally, the interview method provides more than just additional voices; it provides facts, expertise, balance, depth and credibility. It also breathes life into information from the survey that might otherwise fall flat.

In terms of quantitative methods, the current study replicates the Bhattacharjee (2001b), Hargittai (2005) and Venkatesh et al., (2003) studies, which used surveys. As the purpose of the current study is to examine the relationships between the variables that “have been previously identified and measured” rather than to explore “what are the variables involved” (Perry, 1998, p.78), Perry suggests quantitative methodology is appropriate (Perry, 1998).

This study was conducted within the positivist paradigm in which “the observer is independent and the word is objective and external” (Remenyi & Williams, 1998, p.104). Therefore, the study focused on facts provided by analysis of data collected from the survey and interviews. As the Bhattacharjee, Hargittai, and Venkatesh et al. studies had been replicated in other contexts before, a close replication using a similar methodology and context was considered more appropriate. Section 5.5 and its sub-sections will provide the details of the survey.

5.4 Research design

In order to address and treat the research objectives properly, a researcher needs to choose an appropriate research design to collect data (Straub, Boudreau, & Gefen, 2004). Research design is a structured set of rational decision-making choices, or

guidelines to support in generating reliable and valid research outcomes (Seddon & Scheepers, 2011). The current research design is pictorially represented in Figure 5.1, as shown in the diagram; the literature review was a continuous activity during the current study.

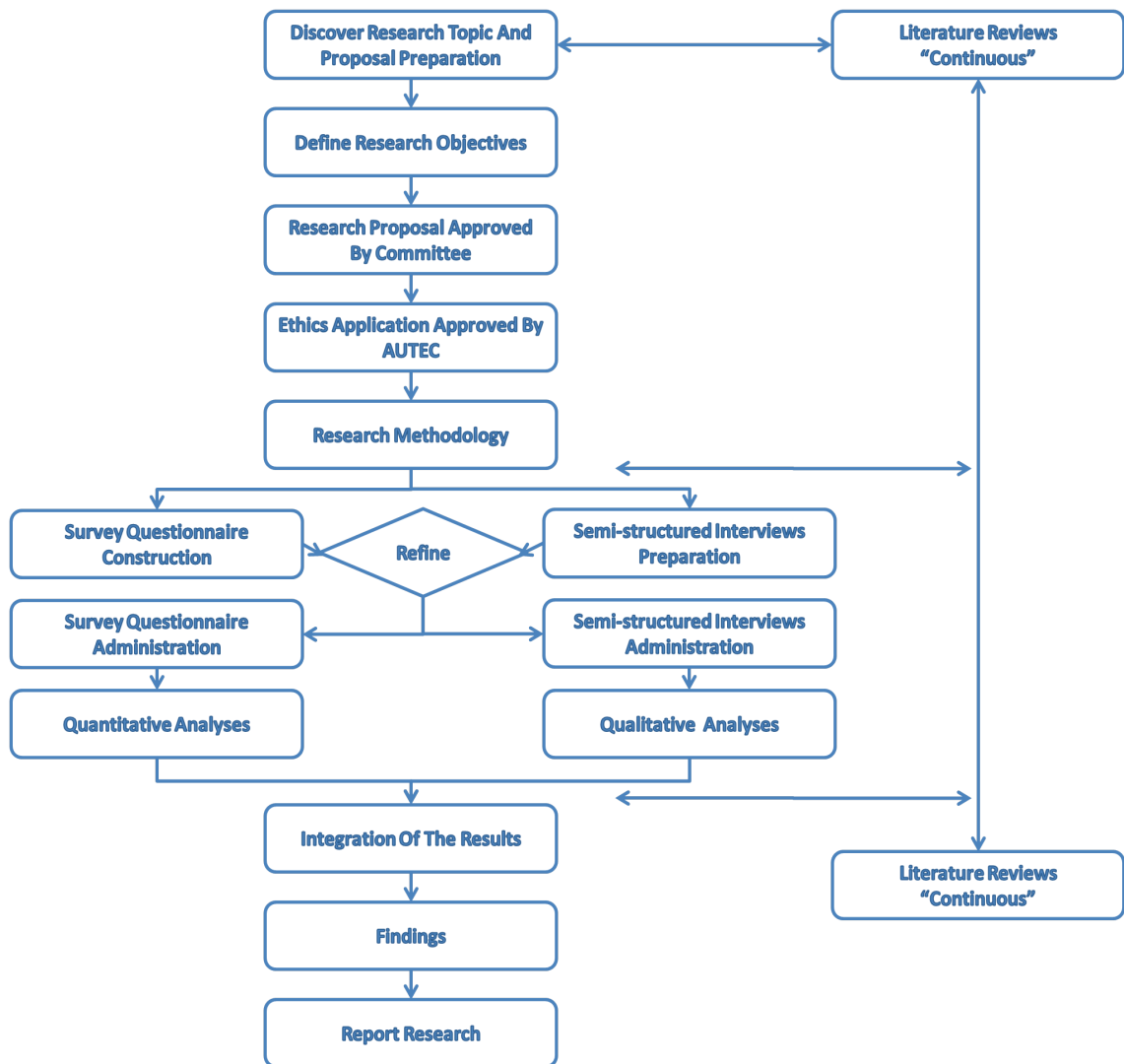


Figure 5.1: Research design

5.5 Survey

This section describes survey development, data collection, data analysis, and validity and reliability issues.

5.5.1 Survey development

A structured self-administered questionnaire was used. All the questions were closed-end questions and the survey was administered as a hard copy as well as an online survey tool using Qualtrics. The survey can be accessed here: http://autfbl.qualtrics.com/SE/?SID=SV_819uz0a7TX6IH1a

5.5.1.1 Qualtrics

The Qualtrics survey tool is available to all AUT students, and staff through a university-wide site license. The Qualtrics survey tool is a full-featured, easy-to-use, web-based tool that allows users to create and take survey through a web browser. It also comes with various question types and provides premade questions as well. Moreover, it is able to provide several methods distribution and analysis of the results. Its features and abilities are:

- Quick Survey Builder that guides beginners through creating a survey
- Survey Library with templates that you can customize to meet your specific needs
- Tool to send and track participation invitations and reminders
- Tool to display survey results, graphically and statistically
- Ability to export data, including to SPSS or Excel

5.5.1.2 Self-administrated questionnaire

Respondents answered the self-administered questionnaire from the Qualtrics web link, as well as through hard copies sent by the researcher. As suggested by Saunders, Lewis, and Thornhill, “the self-administered method could help to elicit participants beliefs, opinions, attitudes, perceptions” (Saunders, Lewis, & Thornhill, 2009, p.121). Saunders et al. (2009) state that self-administrated questionnaires ensure the right respondent participates in research. Since the current study was set in New Zealand, the survey had to be dispersed to a large geographical area, making this an appropriate method. Online surveys can significantly reduce the time needed for implementation and improve response rates (Dillman, 2007).

5.5.1.3 Survey design

The survey consists of 34 items taken from the Bhattacharjee (2001b), Hargittai (2005), and Venkatesh et al. (2003) studies. The questionnaire (Appendix D) has five sections. The first section asked for the participants’ general demographic information including location, education background, social role, gender, age and work experience.

The second section explores the participants’ ICTs and digital literacy background (based on Hargittai’s study). In this section, respondents’ digital knowledge, experience and Internet use were studied. This helps measure participants’ literacy and ability to use online technologies. Based on Hargittai’s (2005) recommendation (page 375), a sum of seven items from Q 20 was used to develop the digital literacy scale.

The third and fifth sections of the questionnaire used existing scales obtained from the Bhattacharjee and Venkatesh et al. studies (except Q.22). These sections are designed to explore the participants' perceptions and experiences with Web 2.0 tools before and after usage. The fourth section was used to divide participants into two groups: those who currently use Web 2.0 tools continue to answer the rest of survey and those who do not use Web 2.0 tools could skip to the end of the survey. This allows the researcher to differentiate between the two groups of respondents: those who are using Web 2.0 tools and those who were not.

5.5.1.4 Likert-type scales

Likert-type scales are commonly used for measuring attitudes, beliefs and opinions (DeVellis, 2011). Therefore, it was appropriate for this research as the research measured professionals' beliefs and opinions concerning their attitude towards Web 2.0 usage.

According to Hinkin, the main issue in using likert-type scale is “to generate sufficient variance among respondents for subsequent statistical analysis” (1995, p.977). Moreover, Clark and Watson state providing more response alternatives does not necessarily increase validity or reliability of responses because respondents might not be able to make more subtle distinctions that are required, and might respond randomly, which in turn would lead to invalid responses (Clark & Watson, 1995). Researchers have found that reliability of responses increases steadily for a 5-point scale or 7-point scale (Lissitz & Green, 1975 cited in Hinkin, 1995). Therefore, a combination of 5-point scale and 7-point scale should be appropriate to generate sufficient variance of responses.

Bhattacharjee (2001b), Hargittai (2005), and Venkatesh et al. (2003) used Likert-type scales in their studies and yielded satisfactory variance of responses for their statistical analysis. Thus, the Likert-type scale method remained unchanged in current study. In this study the questionnaire requires participants to respond to some statements from 1 to 5 where 1 represents having “no understanding” and 5 represents having “a full understanding” of the term and to some statements from 1 to 7 where 1 represents very strongly disagree and 7 represents very strongly agree on their answers. The following Table 5.1 shows the scales used in the research model. There were 10 constructs, and a total of 32 items to measure them.

Table 5.1: Construct items of scales

Construct	Code	Hyp.	Statement	Source
Performance Expectancy (PE)	PE1	H1	23- I expect to find Web 2.0 tools useful for my CPD	Venkatesh et al, (2003)
	PE2		24- Using Web 2.0 tools will enable me to accomplish tasks for my CPD more quickly	
	PE3		25- Using Web 2.0 tools will increase my productivity in carrying out my CPD	
	PE4		26- If I use Web 2.0 tools, I will increase my chances of getting a raise	
Effort Expectancy (EE)	EE1	H2	27- My interaction with Web 2.0 tools will be clear and understandable	
	EE2		28- It will be easy for me to become skillful at using Web 2.0 tools	
	EE3		29- I will find Web 2.0 tools easy to use	
	EE4		30- Learning to operate Web 2.0 tools will be easy for me	
Social Influence (SI)	SI1	H3	35- People who influence my behavior think that I should use Web 2.0 tools for my CPD	
	SI2		36- People who are important to me think that I should use Web 2.0 tools for my CPD	
	SI3		37- The senior management of my organization has been helpful in the use of Web 2.0 tools for my CPD	
	SI4		38- In general, my organization has supported the use of Web 2.0 tools for my CPD	
Facilitating Conditions (FC)	FC1	H4	39- I have the resources necessary to use Web 2.0 tools for my CPD	
	FC2		40- I have the knowledge necessary to use Web 2.0 tools	
	FC3		41- Web 2.0 tools are not compatible with other technologies I use	
	FC4		42- A specific person (or group) is available for assistance with difficulties I experience with Web 2.0 tools	
Digital Literacy (DL) (sum of 7 items)	DL1	H5	19- Do you know how to download a file from the World Wide Web to your computer?	Hargittai, (2005)
	DL5k		20- How familiar are you with the following terms? MP3	
	DL5ag		20- How familiar are you with the following terms? Preference setting	
	DL5ai		20- How familiar are you with the	

			following terms? Refresh/Reload	
	DL5aj		20- How familiar are you with the following terms? Newsgroup	
	DL5ak		20- How familiar are you with the following terms? PDF	
	DL5al		20- How familiar are you with the following terms? Advanced Search	
Adoption	ADPT		43- I am using Web 2.0 tools for my CPD	No source
Expectation Confirmation (EC)	EC1	H6 & H7	49- My experience with using Web 2.0 tools was better than what I expected	Bhattacharjee (2001b)
	EC2		50- The service level provided by Web 2.0 tools was better than what I expected	
	EC3		51- Overall, most of my expectations from using Web 2.0 tools were confirmed	
Perceived Usefulness (PU)	PU1	H8 & H9	45- Using Web 2.0 tools improves my performance in managing my CPD	
	PU2		46- Using Web 2.0 tools increases my productivity in managing my CPD	
	PU3		47- Using Web 2.0 tools enhances my effectiveness in managing my CPD	
	PU4		48- Overall, Web 2.0 tools are useful in managing my CPD	
Satisfaction (S)**	S1	H10	55- How do you feel about your overall experience of using Web 2.0 tools for your CPD? Satisfaction	
	S2		55- How do you feel about your overall experience of using Web 2.0 tools for your CPD? Pleasure	
	S3		55- How do you feel about your overall experience of using Web 2.0 tools for your CPD? Contentment	
	S4		55- How do you feel about your overall experience of using Web 2.0 tools for your CPD? Delight	
Continuous Intention (CI)	CI1		52- I intend to continue using Web 2.0 tools for my CPD, rather than discontinue their use	
	CI2		53- My intentions are to continue using Web 2.0 tools for my CPD than use any alternative means (traditional learning)	
	CI3		54- If I could, I would like to discontinue my use of Web 2.0 tools for my CPD	

Note: PU, PE, EE, SI, FC, EC, CI are 7-point scales. DL (DL5k, DL5ag, DL5ai, DL5aj, DL5ak, and DL5al) and S are 5-point scales. DL1 and ADPT are dichotomous (yes or no) questions.

** Satisfaction items are based on semantic differential scales whereas all remaining scale items are Likert scales.

5.5.1.5 Pilot survey

A questionnaire should be pilot tested before researchers intend to use it to collect data to increase its efficiency and validity (Saunders et al., 2009). Pilot testing enables researchers to find out the time required to complete the questionnaire, whether any questions are biased or wrongly encoded, whether the questionnaire directions are easy to follow, and any other problems related to the survey's design (Dillman, 2007). The survey was pilot-tested by six individuals and some questions were amended based on their feedback. Overall, the respondents to the pilot survey indicated that the questionnaire was easy to understand and complete, and did not take too long to complete.

5.5.2 Data collection

The data was collected from June 2011 through November 2011 through the paper and online surveys. The target population was the accounting profession, which includes auditors, financial accountants and managerial accountants. This profession was chosen because: a) CPD is a key requirement for retaining certification, b) various professional accounting organizations are active in managing CPD activities, and c) some Web 2.0 tools, such as podcasts, RSS and blogs, are being used for CPD activities.

To ensure that the relevant population responded to the survey, professional accounting organizations, such as ACCA, CPA, and NZICA, were contacted by the researcher and the researcher's supervisor to see if they would support the project. In return for their assistance, these organizations were offered a report summarizing the findings of the survey as an incentive. Once their approvals were received, the organizations were sent a short paragraph on the survey and the link to the survey. They published this on their websites and/or sent it their members as an email notice (see Appendix E). To improve the response rate, all respondents were offered an equal opportunity to win 2 NZ\$50 gift vouchers.

Besides the professional accounting organizations, snowball sampling was also used to increase the response rate. Snowball sampling refers to non-probability sampling, and is useful when respondents are not easy to obtain (Dillman, 2007). When someone participates in research, they are also asked to recommend their friends to participate in the research. This method helps ensure that the respondents meet the researcher's criteria (Dillman, 2007; Fink, 2003). For this study, the researcher sent the survey

invitation to her acquaintances who were APs, with a request that they forward it to their colleagues who were also APs.

About 250 invitations were distributed by the researcher in this way, in addition to the links to the online survey that were distributed by the professional organizations. A total of 91 surveys were returned, of which six of these were incomplete. Therefore, a total of 85 completed surveys (online and offline) were usable.

5.5.3 Quantitative data analysis procedure

SPSS v18 was used to obtain descriptive statistics for the variables. Structural Equation Modeling (SEM) was then used to assess the models. SEM is a combination of path analysis and factor analysis that allows researchers to simultaneously consider the relationships between multiple independent and dependent variables in a single, systematic analysis (Gefen, Straub, & Boudreau, 2000). The interest in SEM is often on the *theoretical constructs*, represented by the latent variables. The relationships between these latent variables (the structural model) are theoretically derived and represented by the path coefficients between the factors. At the same time, SEM also allows the testing of the measurement model, which refers to the relationships between the observed indicators and the latent variables.

SEM can be carried out in two ways: a) the covariance-based approach (with tools such as EQS, Amos, Lisrel and others), and b) the component-based approach, which is referred to as PLS. In covariance-based SEM, the goal is to test whether the covariance matrix predicted by the research model fits the covariance matrix of the sample data. The statistical results for this approach take the form of goodness of fit indices, which indicate how well the data fit the model. Component-based SEM, on the other hand, is variance-based and focuses on maximizing the prediction of the dependent variables, instead of explaining the covariation in the data. Because of this difference, component-based SEM in the form of PLS makes fewer demands on the underlying data distribution and sample size, compared to covariance-based SEM (Chin, 1998). PLS is also useful because it provides explicit estimates of latent variable scores, unlike covariance-based SEM (Urbach & Ahlemann, 2010).

For this study, the PLS approach was chosen because, besides the small sample size, the dataset was found to contain a number of abnormally distributed variables, with high kurtosis values. Smart PLS 2.0 M3 (Ringle, Wende, & Will, 2005) was used to carry out the analysis, and a p-value of 0.05 was set as level of significance to support or reject the

hypotheses. The measurement model was evaluated by using Confirmatory Factor Analysis (CFA). CFA helps to validate and verify the factor structure of the latent variables by providing measures of the validity and reliability of the constructs (Cole, 1987).

This study examined the construct, content, convergent, and discriminant validity of the instruments. Construct validity is the extent to which an operation measures the concepts that it purports to measure (Straub, 1989). Each item in an instrument should be representative of the construct, and collectively the item should widely cover all aspects of the construct (Lewis, Templeton, & Byrd, 2005). To ensure validity of constructs' items, all 32 items of ten constructs of this study were developed by using existing validated scales from the previous researches.

Content validity is mostly established through literature reviews and expert panels (Boudreau, Gefen, & Straub, 2001). To ensure content validity of each constructs' items in the instruments, this study reviewed the literature comprehensively and used expert opinions. Convergent validity is a function of the association between two different measurement scales, which are supposed to measure the same concept, and is achieved when multiple indicators operate in a consistent manner (Straub, 1989).

Discriminant validity refers to the extent to which a measure is distinct from other measures (Hair, Black, Babin, Anderson, & Tatham, 2006). . Ideally, an item is expected to be related to other items that measure the same construct (convergent validity), but to differ from items, which measure different constructs (discriminant validity) (Hair et al., 2006). For this study, convergent validity was optimized by using multiple items to measure all constructs. All of the scales were adopted from established scales that have been tested for validity previously. Discriminant validity was tested according to Anderson & Gerbing's (1988) suggestion.

Reliability is concerned with the internal consistency and stability of a measurement (Boudreau et al., 2001; Sekaran, 2006). According to Straub, reliability analysis answers the question: "Do the measures show stability across the units of observation? That is, could measurement error be so high as to discredit the finding?" (Straub, 1989, p.150). Reliability is often estimated by Cronbach's Alpha, which ranges from 0 (completely unreliable) to 1 (perfectly reliable) (Lewis et al., 2005). It is widely used in the social sciences because it provides a measure of reliability that can be achieved from one testing session or one administration of a questionnaire (Leech, Barrett, & Morgan, 2005). This study used Cronbach's Alpha and composite reliability (CR) to assess the

reliability of the measures (Cronbach, 1951; Nunnally, 1978; Sellitz, Wrightsman, & Cook, 1976).

After establishing the quality of the constructs, the structural model was evaluated by examining the path coefficients for the hypothesized relationships. Using a bootstrap sampling method, 500 samples were generated to estimate the path coefficients and their *t*-values, as well as the R^2 for each dependent variable.

5.6 In-depth interviews

Like other IT adoption studies (Nodder et al., 2003), semi-structured interviews were conducted after the survey. Such interviews are useful because they provide more details for this study, as the interviewer could interact with the respondents (Ross, 1974). Semi-structured interviews provide a framework with a set of categories to be tested from the literature, similar to a structured interview, but allow the interviewers to be flexible and give the respondents opportunities and flexibility with their responses (Bryman & Bell, 2007).

Twelve in-depth interviews were conducted using ooVoo and Skype, because the participants were located outside the Auckland metropolitan area. The focus of the interviews was to obtain further insight into the extent to which professionals understand and utilized Web 2.0 technologies and any concerns that they may have in responding to the trend towards using Web 2.0 technologies. The interview questions were in a semi-structured format. They consisted of 16 semi-structured questions, which are better described as probes. The answers were written down and transcribed by the researcher, because the participants declined to be recorded. The questions were designed to stimulate respondents to provide information on the factors they believed have influenced their intention to use or avoid Web 2.0 for their CPD.

5.6.1 Sample recruitment

A purposive sampling technique was employed for this part of the study. To recruit participants for the interviews, managers of small and medium-sized accounting firms in New Zealand were contacted by the researcher. The study was described to them thoroughly in a simple and friendly way to encourage their participation. This participation constituted the firm giving permission to interview its employees. The twelve APs interviewed were a mix of managers, auditors and professional accountants.

A Participation Information Sheet (Appendix B) explaining the research and the

interviewees' role in the study, and a Consent Form (Appendix C), were mailed to them. The interviewees were assured that their privacy would be protected. At the start of interviews via ooVoo and Skype, all participants were asked to confirm that they had received these forms and provided their verbal consent to participate. Snowball sampling was used at the end of the interview when the interviewees were asked to nominate another employee.

5.6.2 Qualitative data analysis strategy

Bogdan and Taylor (1975) define qualitative analysis as a "... process, which entails an effort to formally identify themes and to construct hypotheses (ideas) as they are suggested by data and an attempt to demonstrate support for those themes and hypotheses" (cited in Tesch, 1990, p.113). This process involves three stages: data reduction, data display and conclusion drawing (Miles & Huberman, 1994). An alternative way of organizing the activities is: accuracy test and data reduction, coding, and selective coding and adding the data interpretation as the last stage of the analysis as suggested by researchers (Kaplan & Maxwell, 2005; Myers & Avison, 2002; Sandelowski, 1998; Silverman, 2006; Wolcott, 1994) (see Figure 7.1). These steps/stages involve extracting some organized meaning from the many pages of interviews transcripts; beginning with identifying the descriptive themes and concluding with the interpreting of those identified themes.

All of the interviews were transcribed by the researcher. Following each interview, ambiguous areas were identified and clarifications sought from the interviewee. To assess the reliability of the data, the researcher asked interviewees to clarify some of their comments later on during their interview. In some cases, two employees from the same firm were interviewed, and this enabled their experiences to be compared and counter-checked (Hair, Celsi, Money, Samouel, & Page, 2011; Saunders et al., 2009; Sekaran, 2006). The validity of interview data can be assessed by comparing it with other sources of information. In this study, this was achieved by comparing the interview findings with the survey results (Creswell, 2009; Hair et al., 2011; Saunders et al., 2009; Sekaran, 2006).

The coding process was performed by the researcher, and theoretical saturation was achieved after three rounds of coding. The results of the qualitative data analysis were interpreted both separately and in conjunction with the findings from the survey. The analysis of the interviews will be discussed in Chapter 7.

5.7 Ethical consideration

Since this study uses human subjects, attention needed to be paid to ethical values. The participants for the survey were mature adults (over 18 years old), and were provided with an Information Sheet describing the study. This sheet was incorporated in the online survey as well as the hard copy version, and was used to obtain informed consent from the participants.

Ensuring the dignity and safety of the participants was also important for the interviews. They received a 'Participant Information Sheet' (Appendix B), which outlined that the research process was commonplace and safe. It informed them what they should do if they felt any discomfort when answering the questions and/or being transcribed. Finally, they were told that the data would be anonymized and confidential so as to protect their privacy.

This study was considered to have a low level of ethical risk based on guidelines in AUT's Ethics Knowledge Base: no deception was involved, the participants had to provide informed consent, and the project would only be conducted after being approved by the Auckland University of Technology Ethical Committee (AUTEC). The ethics approval form is attached as Appendix A.

Chapter summary

This study used quantitative and qualitative data to identify the factors that influence the adoption and continued use of Web 2.0 tools by APs for their CPD. A survey was designed based on Bhattacharjee 2001b, Hargittai 2005, and Venkatesh et al. 2003. 250 invitations to participate in the research were sent. In total, out of 91 returned questionnaires (online survey and paper survey), 85 were usable. The data was analyzed with SPSS 18.0 and SmartPLS 2.0. Twelve semi-structured interviews were also carried out, and their data were coded and summarized. The next two chapters present the results of the analyses.

CHAPTER 6: QUANTITATIVE ANALYSIS

6.1 Introduction

This chapter discusses the quantitative data analysis that was carried out and the results of this analysis. The next chapter contains the results of the qualitative portion of the study. This chapter begins by describing the procedures used for data preparation. Next, I provide some descriptive statistics of the sample. Following that, I show how my research model was evaluated with Partial Least Squares (PLS) and provide the results for the measurement and structural models

6.2 Data preparation for statistical analysis

Data preparation includes data coding, entering it into a database, cleaning it, and checking for any missing data (Fink, 2009). This study followed the data preparation procedure as follows:

- All data from the paper surveys was entered into Qualtrics in order to have all data (web-based and paper responses) in one database.
- After the data was entered to Qualtrics, the raw data was checked visually.
- All data sets were sight-edited for usability and completeness to check if they completed by eligible participants. For instance, if a respondent responded all questions exactly the same, the data was considered unusable, and/or to check if they are completed, if not, the data was considered not completed.
- The data from the usable responses was downloaded into a SPSS 18.0 statistical package.
- After the data was downloaded to SPSS 18.0, another test was conducted to make sure that the data had been appropriately downloaded. The test involved a random sample being examined manually. A systematic random sample of every fourth questionnaire was checked manually by comparing the downloaded data against the original.
- Frequencies were computed using SPSS 18.0 for all variables to check for missing data and outlier responses.

6.3 Data cleaning

Using boxplots, outliers were identified for each of the constructs. They were:

- Respondents 3, 34 and 70 for the PE items;
- Respondents 3 and 70 for the EE items;
- Respondents 2, 23, 39 and 70 for the FC items; and
- Respondents 16, 34, 38, 39 and 70 for the SN items

These results indicated that participant 70 should be removed from the dataset as s/he was an outlier on all of the factors. Thus, the following analysis was carried out without participant 70's responses.

6.4 Descriptive analysis

91 surveys were returned. Of these 91, 6 were unusable because they were incomplete. After removing the outlier, 85 surveys were used for the analysis. Appendix G provides descriptive statistics for the set of variables in the current study.

6.4.1 Demographics

Appendix F provides mean score for demographic information, while Table 6.1 provides a general overview of the participants' demographic information, such as gender, age, CPD requirement, training, education, and work experience. 49 (57.6%) respondents were female and 36 (42.4%) were male. Most (61.2%) of the respondents had no children. The largest group of participants (42.4%) was aged between 20 and 30, and about a third was between 31 and 40. About half of the respondents were accredited with NZICA, while 21.2% were part of CPA Australia. Almost all (92.9%) of them required CPD to maintain their professional accreditation. 52.9% of respondents had attended professional training in the last 12 months. Most (44.7%) respondents were university graduates, and a third of them (32.9%) had master's degrees. Most participants were from Auckland (75.3%), followed by Wellington with 8.2% and Hamilton with 7.1%.

34.1% of the working respondents had less than 5 years of work experience, while 25.9% had between 11 to 20 years of work experience. Nearly half (47.1%) had less than 5 years of accounting experiences, followed by those who had 6-10 years of experience (37.6%). 65.8% of respondents were working in SMEs, which are defined as firms with fewer than 30 employees.

Table 6.1: Demographic characteristics

Variables	Frequency	Percent	
Gender	Female	49	57.6
	Male	36	42.4
Age	Below 20	0	0
	20 - 30	36	42.4
	31 - 40	24	28.2
	41 - 50	15	17.6
	Above 50	10	11.8
Accredited with	NZICA	42	49.4
	CPA	18	21.2
	Others (e.g. ACCA)	28	32.9
CPD requirement	Yes	79	92.9
	No	6	7.1
Training	Yes	45	52.9
	No	40	47.1
Education	University Graduate	38	44.7
	Master Degree	28	32.9
	PhD	3	3.5
	Qualification e.g. ACCA	16	18.8
City	Auckland	64	75.3
	Christchurch	2	2.3
	Dunedin	1	1.2
	Hamilton	6	7.1
	Wellington	7	8.2
	Others	6	7.1
Working	Yes	69	81.2
	No	16	18.8
Work experience (years)	Less than 5	29	34.1
	6 - 10	15	17.6
	11 - 20	22	25.9
	21 - 30	14	16.5
	More than 30	5	5.9
Accounting experience (years)	Less than 5	40	47.1
	6 - 10	32	37.6
	11 - 20	9	10.6
	21 - 30	3	3.5
	More than 30	1	1.2
Is childcare needed?	Yes	33	38.8
	No	52	61.2
No. of employees in firm	Self-employed	16	18.8
	Less than 10	18	21.2
	11 - 20	11	12.9
	21 - 30	11	12.9
	31 - 50	10	11.8
	More than 50	19	22.4

6.4.2 Digital literacy

Table 6.2 reflects different aspects of the respondents' digital literacy. Almost all respondents (98.8%) access the Internet several times a day, while only 1.2% accessed the Internet a few times a week. The respondents communicate mainly with their mobile phones and email. Online communications methods, such as VOIP and chat rooms, had penetration rates with 49.4%, 28.2%, and 17.6% respectively. Nearly all of the respondents saw themselves as being fairly or highly skilled at using the Internet, and could accomplish standard tasks such as downloading files, sending files, opening attachments, and naming a search engine (see Appendix F for mean score).

Table 6.2: Digital literacy characteristics

		Frequency	Percent
Internet usage frequency	Several times in a day	84	98.8
	Once a day	0	0
	A few times a week	1	1.2
	Once a month	0	0
	Less than once a month	0	0
	Never/almost never	0	0
Communication methods	Fax	21	24.7
	Phone	61	71.8
	Mobile phone	80	94.1
	Chat room	24	28.2
	Surface mail	15	17.6
	Courier	7	8.2
	Email	80	94.1
	VOIP (e.g. Skype)	42	49.4
	Face to face	77	90.6
Do you know how to download a file?	Yes	83	97.6
	No	2	2.4
Do you know how to send a file?	Yes	79	92.9
	No	6	7.1
Do you know how to open an attachment?	Yes	84	98.8
	No	1	1.2
Name a search engine	Yes	78	91.8
	No	7	8.2
How would you rate your Internet skills?	Not at all skilled	0	0
	Not very skilled	3	3.5
	Fairly skilled	40	47.1
	Very skilled	34	40.0
	Expert	8	9.4

6.4.3 Comparison between users and non-users

6.4.3.1 Comparing users and non-users in terms of their demographic characteristics

In this section, the users (34) and non-users (51) of Web 2.0 tools are compared (Tables 6.3 and 6.4) and the salient points are mentioned here. 38.8% of females use Web 2.0 tools for their CPD, compared with 41.7% of the males. Half of the non-users were below 30, while only about 30% of users were in the same age group. Similarly, nearly half of non-users had less than five years of work experience, whereas only 11.8% of users were in the same category. These two indicators show that experienced professionals are more likely to adopt Web 2.0 than younger, less-experienced professionals. So, while younger professionals may be more “web-savvy” than their older colleagues, they may not be keen to use Web 2.0 for their CPD because they lack the learning that comes with being part of managing the accreditation process or the peer networks that may support the use of such new techniques.

NZICA members were a bigger proportion of users, and a significant section of non-users were accredited by bodies other than NZICA or CPA Australia. About two-thirds of those who use Web 2.0 tools have undergone training in the last 12 months, compared to about 45% of non-users. These two indicators point to the presence of external influences, in this case peer professionals, in driving technology adoption. About a quarter of non-users were self-employed, unlike 8.8% of users. This indicates the surprising lack of take-up of Web 2.0 tools by individual professionals, even though these tools can help them reduce their training expenses.

While 52.9% of Web 2.0 users required childcare, only about a third of non-users did so. This indicates that professionals with children have adopted Web 2.0 more readily than those without any children. This could be a means to improve the balance between their work and personal lives, because learning through Web 2.0 tools equates less time spent away from the family on training events after work.

Table 6.3: Demographic characteristics of Web 2.0 users and non-users (%)

		Current Web 2.0 users (N=34)	Current Web 2.0 non-users (N=51)
Gender	Female	55.9	58.8
	Male	44.1	41.2
Age	Less than 20	0	0
	20 - 30	29.4	51.0
	31 - 40	23.5	31.4
	41 - 50	32.4	7.8
	More than 50	14.7	9.8
Accredited	NZICA	58.8	43.1
	CPA	29.4	15.7
	Others	20.6	41.2
CPD requirement	Yes	97.1	90.2
	No	2.9	9.8
Training	Yes	64.7	45.1
	No	35.3	54.9
Education	University Graduate	47.1	43.1
	Master's	32.4	33.3
	PhD	8.8	0
	Qualification	11.8	23.5
Working	Yes	91.2	74.5
	No	8.8	25.5
Is childcare required?	Yes	52.9	29.4
	No	47.1	70.6
Work experience (years)	Less than 5	11.8	49.0
	6 - 10	20.6	15.7
	11 - 20	32.4	21.6
	21 - 30	26.5	9.8
	More than 30	8.8	3.9
Accounting experience (years)	Less than 5	32.4	58.8
	6 - 10	50.0	27.5
	11 - 20	11.8	9.8
	21 - 30	5.9	2.0
	More than 30	0.0	2.0
No. of employees in firm	Self-employed	8.8	23.5
	Less than 10	20.6	19.6
	11 - 20	17.6	9.8
	21 - 30	14.7	11.8
	31 - 50	17.6	7.8
	More than 50	20.6	27.5

Table 6.4: Comparing current users and those who intend to use Web 2.0 within demographic categories

		Current Web 2.0 users		Future Web 2.0 users	
		<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>
Gender	Female	38.8%	61.2%	49.0%	12.2%
	Male	41.7%	58.3%	41.7%	16.7%
Accredited	NZICA	47.6%	52.4%	35.7%	16.7%
	CPA	55.6%	44.4%	33.3%	11.1%
	Others	25.0%	75.0%	64.3%	10.7%
CPD requirement	Yes	41.8%	58.2%	48.1%	10.1%
	No	16.7%	83.3%	16.7%	66.7%
Training	Yes	48.9%	51.1%	37.8%	13.3%
	No	30.0%	70.0%	55.0%	15.0%
Education	University Graduate	42.1%	57.9%	42.1%	15.8%
	Master's	39.3%	60.7%	50.0%	10.7%
	PhD	100.0%	.0%	.0%	.0%
	Qualification	25.0%	75.0%	56.3%	18.8%
Working	Yes	44.9%	55.1%	42.0%	13.0%
	No	18.8%	81.3%	62.5%	18.8%

6.4.3.2 Comparing users and non-users in terms of their digital literacy

Table 6.5 shows the proportion of different aspects of digital literacy among users and non-users of Web 2.0 tools. The two groups are mostly similar in terms of the frequency of their internet usage, use of VOIP and chat room applications, and ability to upload or download files. The only significant difference was that about 60% of users considered themselves to be “very skilled” while roughly the same percentage of non-users considered themselves to be “fairly skilled”.

Table 6.5: Digital literacy of Web 2.0 users and non-users (%)

		Users (%)	Non-users (%)
Internet usage	Several times a day	100.0	98.0
	Once a day	0	0
	A few times a week	0	2.0
	Once a month	0	0
	Less than once a month	0	0
	Never/almost never	0	0
Communication methods	Fax	23.5	25.5
	Phone	67.6	74.5
	Mobile phone	94.1	94.1
	Chat room	29.4	27.5
	Surface mail	17.6	17.6
	Courier	5.9	9.8
	Email	97.1	92.2
	VOIP (e.g. Skype)	50.0	49.0
	Face to face	97.1	86.3
Digital Literacy: Downloading a file	Yes	100.0	96.1
	No	0	3.9
Digital Literacy: Sending a file	Yes	97.1	90.2
	No	2.9	9.8
Digital Literacy: Opening an attachment	Yes	100.0	98.0
	No	0	2.0
Digital Literacy: Name a search engine	Yes	88.2	94.1
	No	11.8	5.9
Internet skills	Not at all skilled	0	0
	Not very skilled	2.9	3.9
	Fairly skilled	29.4	58.8
	Very skilled	58.8	27.5
	Expert	8.8	9.8

6.4.3.3 Comparing users and non-users in terms of their familiarity with Web 2.0 tools

Appendix H provides a summary of the participants' experiences with Web 2.0 tools, while Table 6.6 provides the mean scores for users and non-users. As expected, users were more familiar with these tools than non-users. Non-users were most familiar with blogs and social networking sites, which could be attributed to their use of these tools for their personal reasons.

Table 6.6: Mean Familiarity Scores for Web 2.0 tools among Web 2.0 users and non-users

	Users (N=34)	Non-users (N=51)
Blogs	4.21	3.57
Mash-ups	3.44	2.08
Microblogging	3.00	2.27
Podcasts	4.12	3.35
Prediction markets	3.12	2.39
Rating	3.74	3.08
RSS feeds	4.09	2.86
Social networking sites	4.62	4.24
Tagging	4.12	3.43
Wikis	4.03	3.29

(The answers were on a scale of 1 = No understanding to 5 = Full understanding)

6.4.3.4 Comparing users and non-users in terms of the 7-item digital literacy construct

This study followed the advice of Hargittai (2005: p.375) in using a summarized seven-item scale for digital literacy. This scale comprised these items: *Download, MP3, Preference setting, Refresh/Reload, Newsgroup, PDF, and Advanced Search*. Hargittai and her colleagues have found that this shorter scale correlates highly with measures of actual skill, compared to other measures such as time spent online, number of years of Internet use and Internet self-efficacy (Hargittai, 2005; Hargittai & Hsieh, 2012).

The DL construct is a summed measure of the scores for the seven items. Appendices F and I provide mean scores for DL construct (all participants), and frequency for overall sample (7-item DL construct) respectively. Table 6.7 depicts the mean scores for the 7-item Digital Literacy (DL) construct for users and non-users of Web 2.0 tools. Both groups had similar levels of familiarity with the seven DL terms.

Table 6.7: Mean Familiarity Scores for 7-item Digital Literacy (DL) construct among Web 2.0 users and non-users

	Current Web 2.0 users (N=34)	Current Web 2.0 non-users (N=51)
Download	4.59	4.33
MP3	3.65	3.47
Preference setting	4.53	4.14
Refresh/Reload	3.82	3.02
Newsgroup	4.74	4.57
PDF	4.59	4.25
Advanced search	4.59	4.33

6.5 Validation of instrument

The psychometric properties of the constructs were evaluated using Confirmatory Factor Analysis (CFA) with SmartPLS 2.0 (Ringle et al., 2005). The reliability, convergent validity and discriminant validity of the constructs were measured as follows.

6.5.1 Reliability

The reliability of a measure refers to the degree to which the instruments are free of random error, or its consistency and stability (Sekaran, 2006). SmartPLS 2.0 provides values of the Composite Reliability (CR) and Cronbach's alpha for each construct. Researchers suggest a value more than 0.7 is regarded as a satisfactory and acceptable level (Fornell & Larcker, 1981; Hair et al., 2006). As can be seen in Table 6.8, the composite reliability and Cronbach's Alpha statistics for each construct exceed 0.7. Therefore, the reliability of all constructs in the current study is adequate.

Table 6.8: Reliability of constructs

	Constructs	No. of Items	CR	Cronbach's Alpha (α)
Model 1	PE	4	0.95	0.93
	EE	4	0.97	0.96
	SI	4	0.96	0.94
	FC	4	0.87	0.80
	DL	Sum of 7	1.00	1.00
	ADPT	1	1.00	1.00
Model 2	EC	3	0.98	0.96
	PU	4	0.98	0.97
	S	4	0.98	0.97
	CI	3	0.86	0.76

6.5.2 Convergent and discriminant validity

Construct validity of all the current study scales was evaluated by using CFA. As discussed earlier in previous chapter, CFA is considered appropriate in research with pre-validated measurement scales (Bhattacharjee & Premkumar, 2004).

The CFA results for Model 1 and Model 2 are presented in Tables 6.9, 6.10, 6.11 and 6.12. Tables 6.11 and 6.12 also indicate the mean values of the latent constructs, as estimated by SmartPLS 2.0. The three criteria recommended by Fornell & Larcker (1981) for assessing convergent validity are: i) the factor loadings of the items should exceed 0.707, ii) the construct reliabilities should exceed 0.7, and iii) the Average Variance Extracted (AVE) by each construct should exceed 0.50. The results show that all items loaded on their expected factors and that the loadings of the items in both models that exceed the cut-off level. The Average Variance Extracted (AVE) from each construct exceeds the recommended lower limit of 0.50. Thus, convergent validity was established.

Gefen and Straub (2005) recommended two criteria to assess discriminant validity: i) the square root of the AVE for each construct should exceed the inter-construct correlations, and ii) the within-item construct loadings should exceed the inter-construct cross-loadings by at least 0.10. The results indicate that these requirements were met for all pairs of constructs in both models, with the average variance extracted ranging from 0.79 to 0.98 (Table 6.11 and 6.12), and the loadings of items on their constructs were at least 0.10 higher than their loadings on other constructs (Table 6.9 and 6.10).

Table 6.9: CFA results - Model 1

Factors loadings						
Constructs	ADPT	DL	EE	FC	PE	SI
ADPT	1.00	0.20	0.40	0.45	0.56	0.43
DL	0.20	1.00	0.31	0.14	0.16	0.08
EE1	0.45	0.20	0.92	0.62	0.88	0.63
EE2	0.37	0.33	0.95	0.51	0.71	0.35
EE3	0.31	0.34	0.94	0.46	0.64	0.37
EE4	0.34	0.33	0.95	0.53	0.70	0.42
FC1	0.38	0.15	0.56	0.84	0.73	0.70
FC2	0.40	0.27	0.65	0.85	0.69	0.57
FC3	0.33	-0.05	0.27	0.68	0.34	0.48
FC4	0.32	0.02	0.29	0.78	0.38	0.60
PE1	0.53	0.12	0.79	0.61	0.92	0.65
PE2	0.52	0.16	0.71	0.69	0.95	0.69
PE3	0.53	0.13	0.73	0.68	0.93	0.78
PE4	0.44	0.19	0.66	0.54	0.83	0.65
SI1	0.39	0.04	0.36	0.59	0.63	0.92
SI2	0.42	-0.00	0.40	0.64	0.69	0.94
SI3	0.37	0.08	0.48	0.76	0.71	0.96
SI4	0.42	0.19	0.56	0.77	0.79	0.88

PE= Performance Expectancy; EE= Effort Expectancy; SI= Social Influence;
FC= Facilitating Conditions; DL= Digital Literacy; ADPT= Adoption

Table 6.10: CFA results – Model 2

Factors loadings				
Constructs	CI	EC	PU	S
CI1	0.87	0.78	0.83	0.65
CI2	0.88	0.63	0.60	0.59
CI3RV	0.70	0.34	0.41	0.50
EC1	0.70	0.97	0.88	0.50
EC2	0.72	0.98	0.86	0.55
EC3	0.73	0.94	0.87	0.49
PU1	0.75	0.85	0.98	0.66
PU2	0.74	0.84	0.98	0.62
PU3	0.77	0.92	0.94	0.59
PU4	0.71	0.84	0.92	0.60
S1	0.60	0.45	0.57	0.91
S2	0.70	0.50	0.61	0.98
S3	0.66	0.49	0.59	0.98
S4	0.75	0.58	0.67	0.96

PU= Perceived Usefulness; EC= Expectation Confirmation; S= Satisfaction; CI= Continue Intention; CI3RV= CI3 reverse item

Table 6.11: Results for Model 1

Constructs	Mean	AVE	CR	Cronbach's Alpha (α)	ADPT	DL	EE	FC	PE	SI
ADPT	0.39	1.00	1.00	1.00	1.00					
DL	25.6	1.00	1.00	1.00	0.20	1.00				
EE	5.05	0.88	0.97	0.96	0.40	0.31	0.94			
FC	4.70	0.62	0.87	0.80	0.45	0.14	0.58	0.79		
PE	4.78	0.83	0.95	0.93	0.56	0.16	0.80	0.69	0.91	
SI	4.58	0.86	0.96	0.94	0.43	0.08	0.49	0.75	0.76	0.98

Construct composite reliability (CR), Cronbach's Alpha (α) - Reliability, which should be 0.70 or greater. Diagonal elements (bold-shaded) are the square roots of average variance extracted (AVE) by latent constructs from their indicators. Off-diagonal elements are correlations between latent constructs. For convergent and discriminant validity, diagonal elements should be at least 0.707 (i.e., AVE>0.50) and larger than off-diagonal elements in the same row and column.

Table 6.12: Results for Model 2

Constructs	Mean	AVE	CR	Cronbach's Alpha (α)	CI	EC	PU	S
CI	5.81	0.68	0.86	0.76	0.82			
EC	5.46	0.93	0.98	0.96	0.74	0.96		
PU	5.46	0.92	0.98	0.97	0.78	0.90	0.96	
S	4.16	0.92	0.98	0.97	0.71	0.53	0.64	0.96

Construct composite reliability (CR), Cronbach's Alpha (α) - Reliability, which should be 0.70 or greater. Diagonal elements (bold-shaded) are the square roots of average variance extracted (AVE) by latent constructs from their indicators. Off-diagonal elements are correlations between latent constructs. For convergent and discriminant validity, diagonal elements should be at least 0.707 (i.e., AVE>0.50) and larger than off-diagonal elements in the same row and column.

6.6 Structural model evaluation

After confirming the validity and reliability of the constructs, the next step is to test the structural model for the hypothesized paths. For the first model, which aimed to establish the factors that influence users to adopt Web 2.0 tools, the responses of the entire sample (N=85) was used. For the second model, which examines the factors that motivate current users to continue their use, only those respondents who are currently using Web 2.0 tools were tested (N=34).

Figures 6.1 and 6.2 depict the path coefficients for each hypothesized and the t-values which indicate the significance of the paths. In addition, the R^2 values for each dependent variable are shown in the blue circles. Overall, Model 1 explains 35% of the variance in the data and Model 2 explains 68% of the variance in the intention to continue using Web 2.0 tools.

The results of the hypotheses are summarized in Table 6.13. In Model 1, only two of the hypothesized paths are significant: performance expectancy and digital literacy. However, digital literacy is only weakly related to adoption ($\beta = 0.154$; $t = 1.931$). In Model 2, all of the hypothesized paths coefficients are significant and in the expected

direction, except for the relationship between expectation confirmation and satisfaction, which is negative and weakly significant ($\beta = -0.264$; $t = 1.961$).

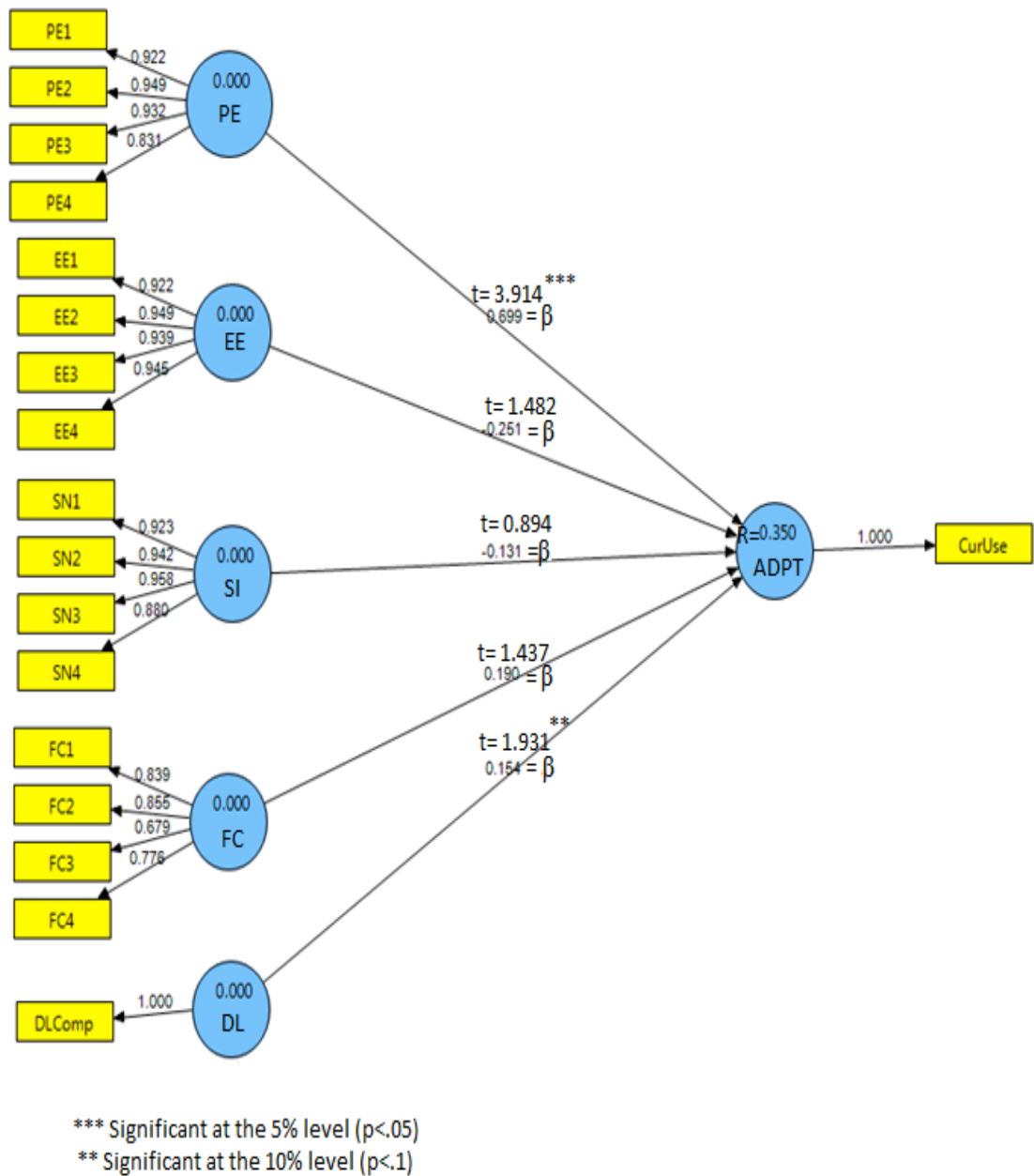
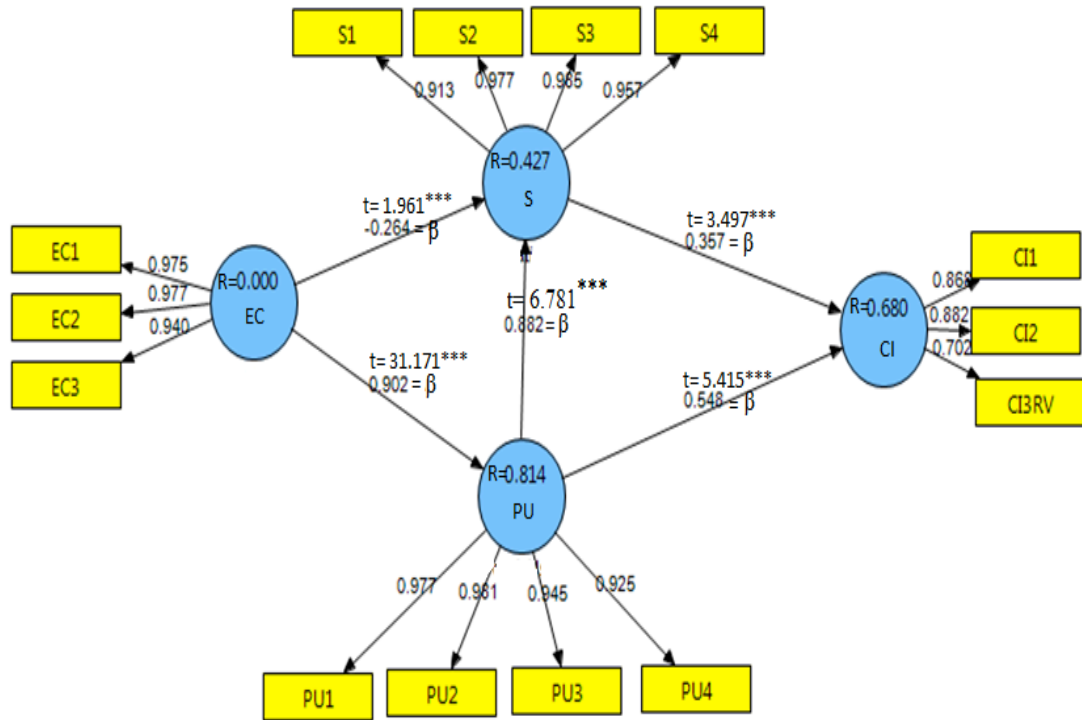


Figure 6.1: Partial Least Square (PLS) results for Model 1



*** Significant at the 5% level ($p < 0.05$)

** Significant at the 10% level ($p < 0.1$)

Figure 6.2: Partial Least Square (PLS) results for Model 2

Table 6.13: Summary of hypothesis tests

Hypothesis		Supported?
Model 1	H1 PE \rightarrow ADPT	Yes
	H2 EE \rightarrow ADPT	No
	H3 SI \rightarrow ADPT	No
	H4 FC \rightarrow ADPT	No
	H5 DL \rightarrow ADPT	Yes
Model 2	H6 EC \rightarrow S	No
	H7 EC \rightarrow PU	Yes
	H8 PU \rightarrow S	Yes
	H9 PU \rightarrow CI	Yes
	H10 S \rightarrow CI	Yes

CHAPTER 7: QUALITATIVE ANALYSIS

7.1 Introduction

This chapter presents the results of the analysis of the semi-structured interviews. The purpose of conducting these interviews was to supplement the findings of the survey. The methods used to collect and analyze the interview data were explained in Chapter 5.

7.2 Sample Characteristics

Twelve informants from ten organizations operating in five industries were interviewed (Table 7.1). The each interview lasted for an average of 40 minutes. All interviews were transcribed by the researcher as recording was not permitted by participants.

Table 7.1: Interview informants

Interview informants			
Organizational role	Industry	Organization size	City
Management Accounting	SBA	Small	Hamilton
Assistant Accountant	SBA	Small	Wanganui
Assistant Accountant ^a	SBA	Small	Albany
Assistant Accountant ^a	SBA	Small	Albany
Financial Accounting & Reporting	SBA	Small	Taranaki
Accounts Officer	SBA	Small	Christchurch
Auditor	Real Estate	Medium	Rotorua
Accountant	Retail	Medium	Tauranga
Management Accounting & Budgeting	Hospitality & Leisure	Medium	Wellington
Financial Manager	Hospitality & Leisure	Medium	Wellington
Payroll ^b	Health Care	Medium	Wellington
Finance Director ^b	Health Care	Medium	Wellington

^{a, b} letters are indicating informants from the same firm.

The data gathering commenced on September 19th and carried on for 45 days, ending on November 2nd 2011. Twelve professionals from eight cities were interviewed using two online technologies, ooVoo and Skype.

The quiet and professional nature of the interview setting allowed the interviewees to feel safe, and for a friendly social atmosphere to be created between interviewees and researcher. This is outlined in Table 7.2 below. In the table, the interviewees were given codes according to the name of city they lived in, for both ethical approval reasons and their comfort, as this ensured their confidentiality.

Table 7.2: Interviewee and interview particulars

Respondent and interview particulars				
	Date	Code	Time	Technology
September	19 th	HAM	10:30 am	ooVoo
	22 nd	WAN	12: 00 pm	ooVoo
	23 rd	AL1	9:30 am	Skype
	26 th	AL2	9:45 am	ooVoo
October	13 th	CHR	5:30 pm	ooVoo
	14 th	TAR	10:00 am	Skype
		WE1	1:00 pm	Skype
	27 th	WE2	2:30 pm	Skype
		WE3	4:30 pm	Skype
	31 st	WE4	3:00 pm	Skype
November	1 st	ROT	8:40 am	Skype
	2 nd	TAU	10:00 am	ooVoo

7.2.1 Qualitative data analysis stages

As mentioned in Chapter 5, this study adopted the data analysis model of Miles & Huberman and developed into four conceptual analysis stages (Figure 7.1). These conceptual stages involve extracting some organized meaning from the many pages of interviews transcripts; beginning with identifying the descriptive themes and concluding with the interpreting of those identified themes.

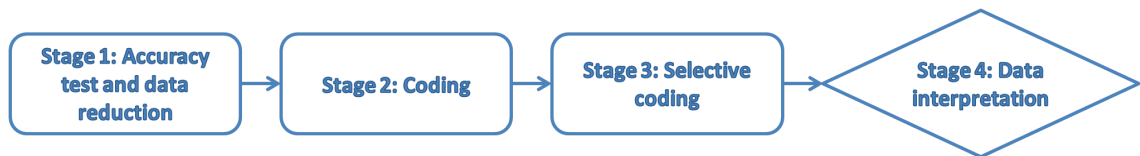


Figure 7.1: Qualitative data analysis stages

Stage 1: Accuracy test and data reduction: to enhance the accuracy of the data, the notes taken during the interviews were read back to the respondents at the end of the each interview. This helped ensure the validity of the data. Data reduction refers to “the process of selecting, simplifying and transforming data that appears in the original documents” (Mile and Huberman, 1994, p.10). The purpose of the data reduction is to report and summarize what the respondents have declared, enabling the detection of invalid data.

Stage 2: Coding: the data within each transcript was grouped according to the questions. A matrix was created, with each question forming a column heading and the twelve interviewees being the rows. The data from the interviews that pertained to each question formed the content of the cells. The aim of the process was to link all answers to any given question to allow the researcher to scan through the data in relation to any question easily, and underline any differences (Auerbach & Silverstein, 2003). Coding was carried out by analyzing the data at a fine grain to extract the concepts that the interviewees referred to. This led to the extraction of 42 concepts. The respondents often embellished their answers with other comments, which meant that there was an ample amount of data.

Stage 3: Selective coding: selective coding begins when the researcher shifts from running the data to delimiting the coding process (Glaser, 1978). Its benefit is that the researcher may concentrate on the analysis of one core variable with all the consequences and conditions that relate to it, but still within the total context developed during the coding (Glaser, 1978). The results of selective coding were eight categories that represented the themes that dominated the thoughts of the interviewees. These eight

themes subsumed the 42 codes that resulted from the initial coding exercise. Some of these eight categories confirmed a number of the factors that were deduced from the literature review, and further validated through the quantitative research.

Stage 4: Data interpretation: connections and themes were used to report the findings. A brief discussion of the factors that hinder accounting professionals from using Web 2.0 tools is provided next, followed by a list of the factors that encourage them to adopt these tools. .

7.2.2 Challenges facing Web 2.0 adoption

7.2.2.1 Theme 1: Infrastructure constraints

Some participants mentioned that IT infrastructure is one of the main challenges users faced with Web 2.0 tools adoption. A Finance Director of an organization stated that the Internet penetration rate in the company is low and was attributed to poor bandwidth, IT literacy, and the limited affordability associated with personal computer and Internet connection costs. In addition, he mentioned system integration as a technical challenge.

“Technical issues such as Internet penetration rate, the cost of accessing the Internet, IT experience, and system integration are the real challenges for employees to adopt Web 2.0 tools”.

7.2.2.2 Theme 2: Culture

Another main challenge for Web 2.0 adoption is culture. This challenge is particularly apparent in New Zealand, because it a multi-cultural country. Some participants referred to many obstructions to access the Internet in general, but culture can be a key challenge to the widespread use of Web 2.0 tools. Some prefer the traditional face-to-face way of learning. In this regard, a Payroll Officer stated:

“In my opinion, some people prefer to get the face-to-face learning services from the CPD providers. But we need to change this culture by building awareness among them regarding the advantages/benefits of using e-learning services I strongly believe that changing users’ culture is fundamental for the widespread of Web 2.0 tools”.

7.2.3 Factors that affect the adoption of Web 2.0 tools by professionals

7.2.3.1 Theme 3: Satisfaction

All respondents agreed on the importance of user satisfaction as one of the main factors that affects their willingness to use Web 2.0 tools. The lack of satisfaction, according is considered as one of the main barriers to Web 2.0 adoption in NZ. The interviewees

view therefore increasing users' satisfaction of web 2.0 tools usage as a vital factor to increase the rate of Web 2.0 adoption. In this regard, for example, the Financial Manager stated:

"We need also to be satisfied with Web 2.0 tools usage, especially when the users are required to pay over the Internet and spend time. When a user wants to get information on financial reports by access to CPD programs through Web 2.0 tools, this may require from user to pay through the internet and spend time to browse to find the useful content. Therefore, it is very important to ensure that users would be satisfied with the content ultimately with Web 2.0 tools. Otherwise user would not intend to use these tools again".

7.2.3.2 Theme 4: Digital literacy/limited IT skills and support

The lack of digital literacy limits the use of Web 2.0 tools by APs. A Management Accounting & Budgeting Officer stated:

"The lack of IT skills among significant portions of the users is a real concern for Web 2.0 adoption".

Many of the respondents believed that they had limited skills to explore new e-learning approaches and lacked the requisite IT skills to engage. Although they generally believed fairly comfortable with "Office applications" and had learnt to use them, they believed that was where their proficiency ended. They knew that they possibly would need to engage with Web 2.0 tools in the future if the demand increased, and staff 'champions' began asking or blogs and other Web 2.0 tools. It seems, however, that there is little support for these developments from accounting professionals. A Finance Director stated:

"One thing I think is a whole question of sort of (Web 2.0 tools) social networking, collaborative approach to e-learning I think it's the challenges that we are all going to face really and I think somewhat all professional employees are pushed in that direction, so, and you know how do we incorporate that sort of thing with these types of materials, they don't necessarily want the tools if they can't interact with in that way".

"We also have a number of employees who have been asking for blogs, because they feel like to use it, and was hard to convince the IT department, when it comes to e-learning then somehow the IT department think it is management responsibility in the centre for development of learning... I had to put a lot of pressure for them to make one available for me for a project so there is always a kind of tension".

7.2.3.3 Theme 5: Perceived usefulness and benefits

The respondents agreed on the importance of concentrating on creating awareness among professionals on how the use of Web 2.0 tools and information could save them money and time. An Auditor expressed this opinion:

“Currently, in my opinion, New Zealanders, according to the existing multi-cultural environment, some prefer to get face-to face learning services. But this needs to be changed by building awareness among them regarding the benefits of using e-learning services. For instance, how the use of e-learning services could save their money and time. Fortunately, Web 2.0 services regarding e-learning is promoting and widely using in educational sectors. In this way people learn how to use Web 2.0 tools to increase their productivities”.

However, professionals will not perceive the full benefits of using Web 2.0 tools until CPD providers provide them with sophisticated and advanced e-services.

CPD providers should provide a straightforward and easy to use service delivery mechanism with minimum effort required. In this regard, an Assistant Accountant said:

“Providing easy to use services to the users is also important”.

7.2.3.4 Theme 6: Reluctance to use Web 2.0 tools for learning – expectation

Although the majority of Internet users engage with Facebook or other social networking tools in their daily lives, the use of these tools by SMEs was limited, reflecting the wider situation in NZ SMEs. Interestingly, employees were reluctant to use such tools in the course of their learning, preferring to use these sites for personal use.

“It is noticeable that these employees have an online presence that they would rather keep separate from their professional life. They prefer to engage in social networking sites for pleasure rather than for learning and want to keep the professional and personal separate”.

“I am personally concerned that employees are naive in their use of social networking sites and believe that they often present an online participation that may expose them to risks”.

“I know some organizations encourage the use of Facebook within their learning and teaching. My organization said “No, it’s not going to happen” there are some issues regarding data protection, so ...And I also had problems with getting information for my particular topic. It means the service level provided by online tools is not what I expected.....”.

Some participants commented on the quality of service of Web 2.0 tools. Some of the

aspects they mentioned included: providing reliable online services; auditing websites, including e-learning sites to ensure the accuracy and freshness of information; and responding to enquiries accurately and quickly. An Accounting Assistant pointed out the key role of response and reliability:

“ ... If an online service is down, users will not use it. After providing online services, there must be customer services to provide responses to all enquiries quickly and clearly”.

7.2.3.5 Theme 7: technological innovation

This study provides an overview on the variety of ways in which Web 2.0 gives rise to technological innovation, outlining different areas in which Web 2.0 provides learners with new technological solutions which give rise to innovation in organization, even if this is not complemented by, or embedded in, pedagogical or organizational strategies.

Online content can support more creative and active users engagement in learning. Web 2.0 can open up a massive variety of new channels for accessing knowledge and offering alternative learning opportunities. There are several online communities, which connect learners creating new opportunities for informal learning, for example, LiveMocha is a community that enables language learners and native speakers to connect with each other to learn language in interaction, providing also available learning resources for language learning. A Financial Manager stated:

“Web 2.0 tools can also offer the opportunities to alter traditional educational form by allowing more personalized learning pathway. The initiative is based on pure online learning with no obligatory traditional classroom teaching sessions. Learning takes place through an online platform, consisting of virtual classroom environment, wikis and blogs. This system allows for learners’ flexibility, bridging location and time gaps. Learners are actively taking control over their learning pace and timing and are empowered by the creation of their own learning portfolios. Evidence collected as part of this study indicates that reflective learning and self-confidence are boosted, and differentiation according to learners needs is facilitated. This illustrates that the new generation of digital tools can be appropriated to substitute more traditional educational formats”.

“Web 2.0 tools furthermore support providers in integrating ICT into their teaching. Providers can create educational blogs and invite people and other lecturer to post contents on it. There are different types of educational blogs: school news, classroom diaries, project blogs, literary notebooks etc. The platform provides connections between blogs by means of tags, and cross-search capabilities. It has also a user’s forum and several tutorials”.

7.2.3.6 Theme 8: organizational innovation

Web 2.0 tools facilitate communication channels among organizational subunits characterized by informal networks, weak ties and boundary spanners. Knowledge transfer is fostered through increased social capital by interacting via these informal channels. When employees have access to greater, diverse knowledge, the innovation knowledge barrier should be lower. It is more likely that new ideas are generated and identified out of interactions among diverse knowledge. A finance Director pointed out that:

“The exposure of boundary spanners to diverse knowledge and experts increases organizations’ absorptive capacity to make new linkages and associations among diverse knowledge, leading to the generation of new ideas.”

Organizational use of Web 2.0 tools thus will drive organizational innovation through constant transfer of diverse knowledge facilitated by the interplay of informal networks, weak ties, boundary spanners and social capital.

Chapter summary

Analysing the data from the twelve interviews led to eight themes being surfaced- two factors that hindered the adoption of Web 2.0 tools and six that encouraged adoption. In the following chapter, the results of the quantitative and qualitative methods will be compared to provide a fuller understanding of the phenomenon being studied.

CHAPTER 8: DISCUSSION AND CONCLUSION

8.1 Introduction

This study has contributed to research by integrating the construct of digital literacy with the Unified Theory of Acceptance and Use of Technology (UTAUT), and empirically validating the significance of digital literacy as a predictor of Web 2.0 adoption. In this chapter, the results of the findings from the analysis of the qualitative and quantitative data will be interpreted, as well as a discussion of the contribution of the study and its limitations. The chapter concludes with some ideas for future direction for research in this area.

8.2 Discussion

This thesis studied the adoption of Web 2.0 tools by professionals for their continuous professional development. It was motivated by the low level of adoption by professionals of these tools, which provide benefits such access to a wider network of peers, more up-to-date learning resources, and lower training costs. Therefore, the principal objective of this study is to gain a better understanding of the factors influencing the professional' adoption of Web 2.0 tools. To examine this problem, two research models were developed after a literature review, based on the Unified Theory of Acceptance and Use of Technology (UTAUT), digital literacy, and Expectation Disconfirmation Theory (EDT).

The models were evaluated with a survey as well as a series of semi-structured interviews. These enabled the researcher to understand in depth the factors influencing the adoption of Web 2.0 by professionals. The interviews also allowed the comparison of actual practice with theory. The results revealed that while only 40% of the 85 respondents use Web 2.0 tools currently, the majority of the non-users expressed their willingness to use Web 2.0 tools in the future. The adoption of Web 2.0 tools by professionals was determined by their performance expectancy of these tools, that is whether using these tools will improve their performance, and their level of digital literacy. Unlike prior research, the other factors of the UTAUT model (effort expectancy, social influence, and facilitating conditions) did not have any significant impacts on the adoption of Web 2.0 tools by professionals.

These findings suggest that the digital literacy construct deserves more attention in Web 2.0 adoption research. While performance expectancy has been found to affect Web 2.0 uses, specifically blogging by PR practitioners (Payne, 2008), digital literacy has not been studied as widely yet. Its low-to-medium correlations with the other constructs (Table 6.11), including effort expectancy, which is defined as the degree of ease associated with the use of the system, combined with its significant relationship with Web 2.0 adoption, indicate that it is capturing a unique aspect of user ability.

Moreover, the interview results also indicated that there was concern among users that they lacked the necessary skills and were reluctant to use Web 2.0 tools for their professional needs, preferring to use it for their personal activities. They were also unsure about the quality of service these tools would provide: would the data be up-to-date and accurate? Would they be maintaining an adequate amount of uptime? Would they respond to queries in a timely manner and answer feedback? These comments were intriguing, especially when since the survey indicated that they were fairly similar in terms of their experience with the Internet.

Interview results showed that Web 2.0 tools trigger technological innovation in learning by providing new formats for knowledge gain, management and distribution. Web 2.0 technologies upsurge accessibility and availability of learning contents by providing learners with a wide range of platforms offering a broad variety of educational material. Furthermore, these technologies support new strategies for studying a subject matter by making available a range of dynamic tools for transforming content and displaying information in different formats. Web 2.0 can also contribute to diversifying and enhancing teaching methods and practices by supplying professionals with accessible and adaptable tools and resources. Learners can profit from flexible and dynamic applications that are better suited to their individual learning styles, preferences and needs.

Moreover, Web 2.0 technologies enable networking and community building among providers and learners, allowing for knowledge exchange and collaboration among geographically dispersed groups. It can, in particular, simplify intercultural exchange and cross-border, cross-institutional collaboration by providing environment capable of establishing a sense of community among learners that have never met face-to-face.

Organizational innovation addresses the envisaged change, supported by ICT, whereby learning centers, universities towards learning service providers, companies towards

learning organizations and cities and regions towards learning support environments. This revolution is supported by (1) new collaborative approaches using ICT; (2) new assessment systems, e.g. e-assessment, on-demand testing with immediate feedback for diagnostic purposes, interactive simulation-based testing; (3) new accreditation mechanisms, e.g. in the form of e-portfolios which could be used to provide a digital record of learning achievements in formal, non-formal and informal learning settings and offer a showcase for learners' work.

This study provides an overview on the diverse ways in which Web 2.0 tools and strategies can serve to support organizational innovation. Web 2.0 tools can open up a vast variety of new channels for knowledge distribution, which substantially facilitate the access to and exchange of learning materials allowing multi-directional interaction. Especially professionals are exploiting these new means of information production and distributions to facilitate organizational procedures, involve learners in personalizing their learning pathways, improve communication processes and increase collaboration, support and guidance. Web 2.0 strategy exemplifies the perceived opportunities in enhancing the virtual learning environment with Web 2.0 tools: Blogs and RSS feeds are used instead of newsletters; social bookmarking technologies facilitate the management of course reading lists in a collaborative way; podcasts of public lectures can be downloaded after the event; and online services can help building a sense of community amongst professionals. Similarly, many organizations have recently integrated various Web 2.0 applications into their services aiming to set up an open, collaborative and accumulating eLearning environment for knowledge sharing and networking, supplying learners with tools for online collaboration and networking. As mentioned earlier there are many examples, where Web 2.0 tools used as course platforms facilitate organizational innovation by improving transparency and information distribution. For example, organizations employ a blog environment together with a wiki and other tools such as Youtube, Slideshare or chat to facilitate learning exchanges between learners and providers of the knowledge. Providers can store and manage learning materials and information relevant to the subject on the blog, which is periodically updated and distributed through RSS. Learners can share their insights, assignments and practices and comment on other learners/users' content, improving their collaboration and writing skills. Through the wiki, learners develop a collaborative glossary with the most relevant terms of the discipline.

Similarly, providers use blogs, podcasts and group discussions to facilitate information

exchange. They employ a blog to post information, provide links and add audio-clips in the form of podcasts, by recording their messages over the phone using a free number. Learners receive alerts of any new information added on their computers or iPods and can post follow-up comments. Free podcasts and videos from YouTube, linked to the blog, are part of the course materials. Through a “blogroll” inside the blog, all participants/learners are able to keep up with a collection of all learning logs. All documents, including instructions for assignments are developed using Google Documents, which allows for faster and easier editing and sharing, facilitating learners collaboration and providers’ assessment of individual progress.

These examples validate that Web 2.0 technologies can contribute to innovating the organizational frameworks of knowledge distribution and generation by allowing provider and learner to connect and communicate in a variety of new ways using a range of different media. As a result access to information and learning content is improved; peer support and lecturer guidance are facilitated; a greater range of learning materials, sources and resources, recommendations and experiences is available to learners.

The study’s conceptualization of Web 2.0 adoption as an evolutionary process, arising out of prior proficiency with Web 1.0 applications, was supported by the finding that older, more experienced professionals were more likely to adopt Web 2.0 than younger, less-experienced professionals. Younger professionals may be seen to be “digital natives” because they have grown up with the Internet; however, they may actually be “naive users” (Hargittai, 2010) who vary in the extent to which they are able to incorporate the web in their daily lives. In the context of this study, older professionals, who have experienced the tumult of the Internet’s growth, may be better placed to decide which tools are worth focusing on for their professional needs. In addition, their experience with managing the CPD process may have taught them how to mix and match off-line and online learning mechanisms.

The intention to continue using Web 2.0 tools was significantly predicted by perceived usefulness and satisfaction, confirming prior research (Li & Kishore, 2006). However, although expectation confirmation significantly predicted perceived usefulness, it was negatively and weakly related to satisfaction. One reason for this surprising finding may be that the small sample size used to test Model 2 may affect the reliability of the results. The qualitative results indicated the value of demonstrating the usefulness of the

technology and spreading awareness about it. The respondents also commented on the importance of ensuring user satisfaction so that professionals would continue using these tools. Their uncertainty over the quality of service of Web 2.0 tools supports the inclusion of expectation confirmation in the model.

Future research on Web 2.0 adoption could incorporate this aspect of service quality to develop a measure of expectation confirmation tailored to Web 2.0 use. This would be a valuable contribution because the current measures were developed in an intra-organizational client-server model of technology adoption, whereby a high level of service quality is assumed, so that the focus of adoption studies is on the features of the technology, the adopter and the organization's support structure. Working with Web 2.0 applications, which are usually operated outside an organization's boundaries and where no concrete service levels have been agreed upon, introduces an additional level of complexity into a user's decision to adopt a technology: will it work as it says it does? Researchers should thus consider how established IS theories may change as the material aspects of information technology evolve over time. What are the hidden or unspoken assumptions in these theories? Because they were developed at a certain point in time, are these theories limited by the paradigms of computing, both organizational and architectural, that existed then?

8.3 Practical Implications

This study has implications for three groups of practitioners: professional accountants, CPD providers (who are usually associations of professional accountants), and developers and authors of Web 2.0 CPD services/tools.

For accounting practitioners, the survey highlights that less than half of them are currently using Web 2.0 tools, even though they offer some promising benefits. These advantages are more critical for accounting professionals in SME firms, as described in Chapter 4. Since performance expectancy is a key determinant of adoption, managers of such firms should increase the awareness of these resources and their potential ability to enhance their staff's performance. To ensure the quality of the content and the reliability of the service, they could set up one of the tools, such as a blog, wiki or RSS feed, in-house to provide a comfortable setting for their colleagues to explore and familiarize themselves with the use of these tools. Such a tactic may also increase the digital literacy of those who score lowly in this capacity. Another tactic may be to nominate "power-users" to motivate their local networks as one way to create a learning

culture. These champions could also help ensure that their colleagues' expectations are set at the right level by providing them with realistic examples of the extent to which these tools helped the power-user. Finally, managers of accounting professionals could also ensure that they do not face some of the infrastructure constraints mentioned in the interviews, such as a lack of a blogging platform or procedures/protocols to govern what can and cannot be shared on Web 2.0 sites.

Professional accounting organizations could also work to promote wider awareness of these tools and incorporate them into their existing CPD frameworks. By creating an online network of like-minded learners, the organization may be able to increase its CPD pass rate while lowering its costs. As the accounting profession becomes more focused on wider aspects of information assurance and as the use of modern technologies such as XBRL (Xtensible Business Reporting Language) become more widespread, accountants of all stripes have to increase their digital literacy so that they can take advantage of new opportunities and/or prevent the obsolescence of their skills.

Developers of Web 2.0 tools for CPD can possibly segment the market to serve professionals with high and low levels of digital literacy. They could provide more complex tools for the former group and more basic services for the latter. In addition, they could collaborate with professional organizations to make their members aware of the possible performance improvements the use of Web 2.0 tools could lead to, as well as the usefulness of these tools in helping them achieve their CPD goals. This would address the performance expectancy aspect of encouraging adoption. Shifting from a world where CPD is predominantly delivered offline to an interactive, dynamic, "always on" model of CPD will be challenging, because it highlights key issues, such as: where does authority lie about interpretation? How much debate should there be on procedures or practices? Who monitors these sites for inaccuracies and who is responsible for correcting them? Addressing these issues will be a difficult trial for professional organizations and education providers.

Previous research has suggested that the use of Web 2.0 for e-learning has mainly been to provide access to and disseminate information (Bodell et al., 2009). However, Web 2.0 tools allow users not only to retrieve information but also to use the network as a platform to create and own the data (O'Reilly, 2005). This phenomenon can support online reflection and community-based interaction and knowledge-sharing (Bodell et al., 2009). Though there is an element of content delivery in these systems, there is also

an increasing acknowledgment that learning is a creative activity and that the suitable venue is a platform rather than an application. What is needed is an exploration as to how the content of learning, whether professionally authored or created by users, can be used as the basis for learning activities rather than a conduit for learning content (Downes, 2005).

It is important to note that the professionals interviewed wanted to separate their usage of Web 2.0 tools for their professional development from their usage of these tools for their personal social interaction. They wanted to keep their social networking activities separate from their profession, seeing this as their 'off work' and social space. There were some concerns stated by professionals regarding the formal involvement of professionals through social networking sites. They stated that there was the potential for employees to operate innocently in these environments and put themselves at risk if they exposed their personal details in publicly accessible forums. These publicly available profiles may reflect severely on professionals when they apply for employment or in other formal contexts. These concerns, along with a blurring of the boundaries between professional and personal online activities, may require significant changes in IT skills and culture before potential benefits can be achieved.

8.4 Limitations

The findings of the study should be read in light of its limitations. First, it was designed as a cross-sectional study, which limits its ability to determine causality. Future research could test this model longitudinally. This may possibly strengthen the effects of digital literacy, since it is conceptualized as an evolutionary construct.

Second, by studying New Zealand accountants, the study's findings may be less generalizable to other contexts because of some unique aspects of the business environment here. For example, more than 90% of all firms are SMEs. In addition, the small population (4.5 million) is scattered across a relatively large land-mass, which may prevent the diffusion of information through (physical) social networks, biasing the findings. Conducting comparative studies in different countries would offer an opportunity for comparing the findings and supporting or extending its results.

Third, the use of a self-administrated questionnaire may explain the inconsistency of the findings of Model 1 with prior UTAUT studies. Self-administrated usage measures may be biased or relative so that they cannot accurately represent adoption (Straub, Limayem & Karahanna-Evaristo, 1995) In the context of the current study, it is likely that

professionals' perceptions about "how often" (frequencies) and "how many hours" (duration) they actually use Web 2.0 reflect only their general usages of Web 2.0 in different contexts and at different times.

Fourth, the use of a single survey to gather data on both independent and dependent variables may lead to common method bias (Sharma et al., 2009). Future research could minimize this by system-generated data on adoption and continued use, or by using techniques such as marker variable. Fifth, the 7-item measure of digital literacy may be dated now since it was developed seven years ago. Advancements in technology, such as the growth of mobile devices and the consumerization of technology, may mean that alternative measures of digital literacy should be developed. Another possible direction for further research is to refine the digital literacy construct by adopting a semantic differential scale and testing different weights for the items that make up the construct.

Last, a challenge with this study is in defining "Web 2.0". The various technologies covered by the term, such as wikis, RSS and podcasts, may seem similar to technically-oriented individuals, since they are based on some aspect or variant of XML. However, it is a moot point if users from non-technical backgrounds share the same understanding. To them, the different types of Web 2.0 tools may fall into very different categories and our attempt to put them in a bucket may not make sense to them. Thus, it would be helpful if future research on this topic narrowed its focus by examining one particular type of Web 2.0 tool, while at the same time, finding out if the users of that tool were also involved in or participated in other Web 2.0 tools/services.

8.5 Conclusion

Within the accounting field, although e-learning is being used more intensively in recent years, there has been no significant demand for Web 2.0 tools. Some professionals have demonstrated a willingness to explore new approaches, but many still hold reservations about becoming involved with innovative pedagogical tools and have not yet realized what can be achieved with the tools. The range of possible functions offered by e-learning has not been fully exploited. SMEs especially continue to limit their use of such tools to their repository functions, perhaps pushed to do so because of the poor IT skills of their employees.

Despite its limitations, this study has contributed to research and practice in Web 2.0 adoption. The results revealed the importance of factors such as satisfaction, perceived usefulness, performance expectancy and digital literacy, on the adoption of Web 2.0

tools by professionals. Digital literacy as a construct deserves more attention in e-learning and other settings because it incorporates the idea of IT use as a skill that evolves. In light of these findings, the study has offered various suggestions to different communities of practitioners to improve the adoption of Web 2.0 tools by professionals. Although the potential offered by Web 2.0 tools is significant, it needs to be balanced against the challenges of doing so.

APPENDICES

Appendix A: Ethics approval form



MEMORANDUM

Auckland University of Technology Ethics Committee (AUTEC)

To: Harminder Singh
From: **Dr Rosemary Godbold and Madeline Banda** Executive Secretary, AUTEC
Date: 3 June 2011
Subject: Ethics Application Number 11/76, **Factors that influence the use of Web 2.0 tools for e-learning.**

Dear Harminder

Thank you for providing written evidence as requested. We are pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 11 April 2011 and that on 23 May 2011; we approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 27 June 2011. Your ethics application is approved for a period of three years until 23 May 2014. We advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 23 May 2014;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. This report is to be submitted either when the approval expires on 23 May 2014 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application. Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organization for your research, then you will need to make the arrangements necessary to obtain this.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact Charles Grinter, Ethics Coordinator, by email at ethics@aut.ac.nz or by telephone on 921 9999 at extension 8860. On behalf of AUTEC and ourselves, we wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Dr. Rosemary Godbold and Madeline Banda

Executive Secretary

Auckland University of Technology Ethics Committee

Cc: Soheila Mohammadyarisinderela_y@yahoo.co.nz

Appendix B: Participant information sheet



Participant Information Sheet

May 15, 2011

Project title: **Factors that influence the use of Web 2.0 tools for e-learning**

Dear participant,

Kia Ora

An invitation

I am a Master's student in Business Information Systems at the Auckland University of Technology (AUT). For my thesis, I am studying how accounting professionals, such as auditors and accountants, in New Zealand use Web 2.0 tools, such as blogs, wikis and podcasts, for their continuing professional development (CPD). I am conducting a survey to gather data on this topic, and you are invited to participate in it. Participation is voluntary but your help is greatly appreciated. As an incentive, I will be conducting **a draw in which 2 respondents to this survey will win a prize of a \$50 gift card**. If you agree to participate, please indicate your consent by signing the Consent Form on the next page.

What is the purpose of this research?

The purposes of this research are to:

- Investigate how accounting professionals are using Web 2.0 tools for their CPD
- Identify some of the key factors that influence the use of Web 2.0 tools

How was I chosen for this invitation?

Participants were recruited through contact with professional accounting organizations, such as NZICA and CPA Australia.

What will happen in this research?

The survey will take approximately 20-30 minutes to complete. Please answer each question as carefully as possible. You may decline to answer any specific question if you wish to. If you feel that you cannot answer a question, please continue to the next one.

What are the discomforts and risks?

We do not cause any discomfort for participants. The information collected from the survey will be aggregated and anonymized, so that it will not be linked to any particular individual(s). Your individual data will not be shared and your name and address are not required.

What are the benefits?

The findings of this study will help practitioners and researchers better understand the factors hindering and supporting the use of Web 2.0 tools among New Zealand's SMEs, which dominate its economic landscape. This understanding will help SME managers, IT consultants, vendors and government agencies develop guidelines to encourage the adoption of Web 2.0 application for e-learning, so as to enhance the competitiveness of New Zealand's SMEs in the global business environment.

What are the costs of participating in this research?

The time commitment will be 20-30 minutes. Your participation is vital for the completion of this research project. Should you prefer not to participate, or if you wish to cease participation at any time, you are free to do so.

What opportunity do I have to consider this invitation?

Two weeks

How do I agree to participate in this research?

A Consent Form will accompany the survey. **By completing this survey you indicate your consent to participate.**

Will I receive feedback on the results of this research?

Professional associations who support this study will be offered a report summarizing its findings. Individual participants should be able to read this report if the professional associations provide access to it.

What do I do if have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr. Harminder Singh, Faculty of Business and Law, the Auckland University of Technology (AUT), Auckland. Tel: 9 921-9999 ext. 5029. E-mail harminder.singh@aut.ac.nz. Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEK, Madeline Banda, madeline.banda@aut.ac.nz, 921-9999 ext 8044.

Whom do I contact for further information about this research?

Researcher contact details:

Soheila Mohammadyari, Master student, the Auckland University of Technology (AUT), mobile: 021-1439491. Email: sinderela_y@yahoo.co.nz.

Project Supervisor contact details:

Dr. Harminder Singh, Faculty of Business and Law, the Auckland University of Technology (AUT), Auckland. Tel: 9 921-9999 ext. 5029. E-mail: harminder.singh@aut.ac.nz.

I thank you in advance for your support of this research project.

Sincerely,

Soheila Mohammadyari (Ms.)

**Approved by the Auckland University of Technology Ethics Committee on
23/05/2011 AUTEK Reference number 11/76**

Appendix C: Consent form



Consent to Participate in Research

Title of Project: **Factors that influence the use of Web 2.0 tools for e-learning**

Project Supervisors: **Dr. Harminder Singh**

Researcher: **Soheila Mohammadyari**

- I have read and understood the information provided about this research project in the Information Sheet dated May 15, 2011.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to the completion of data collection, without being disadvantaged in any way. If I withdraw, I understand that all relevant records of my responses, or parts thereof, will be destroyed.
- I agree to take part in this research.
- I understand that I will not be identified in any way including publications resulting from this research.
- I understand that data will be kept for at least six years, and will be destroyed at the end of the research period.
- I would like to be interviewed on this topic Yes ☐ No ☐
- I would like to enter the draw for the \$50 gift card. Yes ☐ No ☐

Participant name:

Participant signature: Date:

Project Supervisor Contact Details: **Dr. Harminder Singh, Faculty of Business and Law, the Auckland University of Technology (AUT), Auckland. Tel: 9 921-9999 ext. 5029. E-mail harminder.singh@aut.ac.nz.**

Researcher: **Soheila Mohammadyari, Master student, the Auckland University of Technology (AUT), mobile: 021-1439491. Email: sinderela_y@yahoo.co.nz.**

**Approved by the Auckland University of Technology Ethics Committee on
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Appendix D: Questionnaire



Examining Web 2.0 use among accounting professionals

We are interested in knowing your experiences with the use of Web 2.0 tools for your continuing professional development (CPD). Web 2.0 tools include blogs, wikis, podcasts, RSS feeds, and social networking sites. Accounting organisations, such as NZICA and ACCA, have started using some of these tools, such as podcasts, as part of their CPD resources.

Your answers are entirely confidential and your name and address are not required. By completing this survey you indicate your consent to participate. A draw will be held where 2 respondents will win a prize of a gift card (2x\$50). If you have any questions on this survey, please address them to: Dr. Harminder Singh, Faculty of Business and Law, Auckland University of Technology, Auckland. Tel: 9 921-9999 ext. 5029, e-mail: harminder.singh@aut.ac.nz. Thank you for your participation.

Please tick the boxes as appropriate, or circle the numbers that best represent your answer.

Section 1: Demographic Information

1. Gender: Female ☐ Male ☐
2. What is your age? (Please round your answer to the nearest whole number)

3. What is your occupation? _____
4. Are you accredited with:
 - a) NZICA (the New Zealand Institute of Chartered Accountants) ☐
 - b) CPA Australia ☐
 - c) Other professional accounting bodies. Please specify: _____
5. Do you require continuing professional development (CPD) to maintain your professional accreditation? Yes/No
6. Did you attend any professional training events in the last 12 months? Yes/No
7. What is the highest level of education you have completed?
University Graduate ☐ Master's Degree ☐ Doctoral Degree (PhD) ☐
Professional Qualifications (e.g. ACCA) ☐

8. Which city do you live in now? _____
9. Are you currently working? _____ Yes/No
If yes, how many hours per week, on average? _____
10. How many years of work experience do you have? (Please round your answer to the nearest whole number) _____
11. How many years of work experience do you have in the accounting/audit industry? (Please round your answer to the nearest whole number) _____
12. Do you have any childcare responsibilities? _____ Yes/No
13. How many employees are there in your firm? _____

Section 2: Internet Use, Knowledge and Experience

14. In which year did you start using the Internet? _____
15. On average, how often do you use the Internet (Choose one)?
Several times in a day ☐ Once a day ☐ A few times a week ☐
Once a month ☐ Less than once a month ☐ Never / almost never ☐
16. On average how many hours a week at work do you use the Internet?
_____ Hours
17. On average how many hours a week at home do you use the Internet?
_____ Hours
18. Which of the following do you use to communicate with others in your daily life?
Tick as many as applicable
Fax ☐ Phone ☐ Mobile Phone ☐ Chat room ☐
Surface Mail ☐ Courier ☐ Email ☐ VOIP (e.g. Skype) ☐
Face to face ☐
19. Please circle the appropriate answer. Do you know:
- | | | |
|--|-----|----|
| How to download a file from the World Wide Web to your computer? | Yes | No |
| How to send a file that is on your computer's hard drive to someone using another computer (i.e. through FTP)? | Yes | No |
| How to open an attachment someone sent you via email? | Yes | No |
| The name of any search engine? | Yes | No |

20. How familiar are you with the following terms? Please choose/circle a number between 1 and 5 where 1 represents having “no understanding” and 5 represents having “a full understanding” of the term.

Modem	1	2	3	4	5	Usenet	1	2	3	4	5
Browser	1	2	3	4	5	Message thread	1	2	3	4	5
Server	1	2	3	4	5	Filtering software	1	2	3	4	5
ISP	1	2	3	4	5	Cookie	1	2	3	4	5
HTML	1	2	3	4	5	DNS parking	1	2	3	4	5
“bcc” option in email	1	2	3	4	5	Mirror site	1	2	3	4	5
Flaming	1	2	3	4	5	P3P	1	2	3	4	5
Spam	1	2	3	4	5	Click-through	1	2	3	4	5
Spider	1	2	3	4	5	Image map	1	2	3	4	5
Boolean expression	1	2	3	4	5	E-zine	1	2	3	4	5
MP3	1	2	3	4	5	Meta-tag	1	2	3	4	5
JPG	1	2	3	4	5	Frames	1	2	3	4	5
XML	1	2	3	4	5	Shareware	1	2	3	4	5
Meta-search engine	1	2	3	4	5	Preference setting	1	2	3	4	5
Natural language	1	2	3	4	5	Remote login	1	2	3	4	5
Proximity operators	1	2	3	4	5	Refresh/Reload	1	2	3	4	5
gov (“dot gov”)	1	2	3	4	5	Newsgroup	1	2	3	4	5
Banner ad	1	2	3	4	5	PDF	1	2	3	4	5
Weblog	1	2	3	4	5	Advanced Search	1	2	3	4	5

21. In terms of your Internet skills, do you consider yourself to be.....

1	2	3	4	5
Not at all skilled	Not very skilled	Fairly skilled	Very skilled	Expert

(Please circle a number)

Section 3: Perceptions of Web 2.0 Tools - prior to usage

Web 2.0 tools are applications that cultivate online participation in content creation and social interaction. Web 2.0 tools include blogs, wikis, podcasts, RSS feeds, and social networking sites. Accounting organisations, such as NZICA and ACCA, have started using some of these tools, such as podcasts, as part of their CPD resources.

22. How familiar are you with the following web 2.0 terms? Please choose/circle a number between 1 and 5 where 1 represents having “no understanding” and 5 represents having “a full understanding” of the term.

Wikis	1	2	3	4	5	Blogs	1	2	3	4	5
Podcasts	1	2	3	4	5	RSS feeds	1	2	3	4	5
Social networking	1	2	3	4	5	Mash-ups	1	2	3	4	5
Microblogging	1	2	3	4	5	Prediction markets	1	2	3	4	5
Rating	1	2	3	4	5	Tagging	1	2	3	4	5

Below are a series of statements about Web 2.0 and CPD. Please indicate your agreement or disagreement with the following statements using the scale shown. If you currently use Web 2.0 tools for your CPD, your answers to the questions below should reflect your perceptions before you began using these tools.

	1	2	3	4	5	6	7
	Very strongly disagree	Strongly disagree	Disagree	neither agree nor disagree	Agree	Strongly agree	Very strongly agree
23 I expect to find Web 2.0 tools useful for my CPD	1	2	3	4	5	6	7
24 Using Web 2.0 tools will enable me to accomplish tasks for my CPD more quickly	1	2	3	4	5	6	7
25 Using Web 2.0 tools will increase my productivity in carrying out my CPD	1	2	3	4	5	6	7
26 If I use Web 2.0 tools, I will increase my chances of getting a raise	1	2	3	4	5	6	7
27 My interaction with Web 2.0 tools will be clear and understandable	1	2	3	4	5	6	7
28 It will be easy for me to become skillful at using Web 2.0 tools	1	2	3	4	5	6	7
29 I will find Web 2.0 tools easy to use	1	2	3	4	5	6	7
30 Learning to operate Web 2.0 tools will be easy for me	1	2	3	4	5	6	7
31 Using Web 2.0 tools is a bad idea	1	2	3	4	5	6	7
32 Web 2.0 tools make work more interesting	1	2	3	4	5	6	7
33 Learning through Web 2.0 tools is fun	1	2	3	4	5	6	7
34 I like learning through Web 2.0 tools	1	2	3	4	5	6	7

- | | | | | | | | | |
|----|--|---|---|---|---|---|---|---|
| 35 | People who influence my behavior think that I should use Web 2.0 tools for my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36 | People who are important to me think that I should use Web 2.0 tools for my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 37 | The senior management of my organization has been helpful in the use of Web 2.0 tools for my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 38 | In general, my organization has supported the use of Web 2.0 tools for my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 39 | I have the resources necessary to use Web 2.0 tools for my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 40 | I have the knowledge necessary to use Web 2.0 tools | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 41 | Web 2.0 tools are not compatible with other technologies I use | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 42 | A specific person (or group) is available for assistance with difficulties I experience with Web 2.0 tools | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Section 4: Current Use of Web 2.0 Tools

- 43 I am using Web 2.0 tools for my CPD Yes/No

If you answered “Yes” to Question 43, continue to Section 5 – Question 45

If you answered “No” to Question 43: continue to Question 44

- 44 I intend to use Web 2.0 tools for my CPD Yes/No

This is the end of the survey for those who have NOT used Web 2.0 tools.

Section 5: Experiences With Web 2.0 Tools – after usage

If you have used or are using Web 2.0 tools for your CPD, please answer the following questions. If not, please go to the end of the survey.

- | | | | | | | | |
|--|------------------------|-------------------|----------|----------------------------|-------|----------------|---------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | Very strongly disagree | Strongly disagree | Disagree | neither agree nor disagree | Agree | Strongly agree | Very strongly agree |
-
- | | | | | | | | | |
|----|--|---|---|---|---|---|---|---|
| 45 | Using Web 2.0 tools improves my performance in managing my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 46 | Using Web 2.0 tools increases my productivity in managing my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 47 | Using Web 2.0 tools enhances my effectiveness in managing my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 48 | Overall, Web 2.0 tools are useful in managing my CPD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 49 | My experience with using Web 2.0 tools was better than what I expected | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

- 50 The service level provided by Web 2.0 tools was better than what I expected 1 2 3 4 5 6 7
- 51 Overall, most of my expectations from using Web 2.0 tools were confirmed 1 2 3 4 5 6 7
- 52 I intend to continue using Web 2.0 tools for my CPD, rather than discontinue their use 1 2 3 4 5 6 7
- 53 My intentions are to continue using Web 2.0 tools for my CPD than use any alternative means (traditional learning) 1 2 3 4 5 6 7
- 54 If I could, I would like to discontinue my use of Web 2.0 tools for my CPD 1 2 3 4 5 6 7

55 How do you feel about your overall experience of using Web 2.0 tools for your CPD?

Please choose a number between 1 and 5 for the following items.

	Very Dissatisfied				Very Satisfied
Satisfaction	1	2	3	4	5
	Very Displeased				Very Pleased
Pleasure	1	2	3	4	5
	Very Frustrated				Very Contented
Contentment	1	2	3	4	5
	Absolutely Terrible				Absolutely Delighted
Delight	1	2	3	4	5

Thank you for completing the survey

*If you would like to be **interviewed** on this topic, or if you would like to **enter the draw for the \$50 gift card**, please send an email to: sinderela_y@yahoo.co.nz*

Appendix E: Publication in newsletter of professional organizations

NEWS ALERT FROM ACCA AUSTRALIA & NEW ZEALAND

ACCA

Auckland University of Technology (AUT) Research Survey

Do you use blogs, wikis, and other types of social media?

The Auckland University of Technology (AUT) is conducting a survey to better understand how accounting professionals' use Web 2.0 tools and what they think of them and specifically in relation to Continuing Professional Development (CPD).

Please support AUT by completing the following, anonymous, survey click [here](#).

Once completed, you will be entered into a draw to win one of two \$50 gift vouchers.

This survey closes Saturday 30 July 2011

"ACCA may monitor and read all e-mails as it is presumed that they are sent or received in connection with the business of ACCA or for business use only. ACCA also monitors e-mails for security reasons to ensure that no unauthorised disclosure of ACCA's confidential information is passed via the e-mail system.

This e-mail and any attachments are confidential. It is intended for the recipient only. If you are not the intended recipient, any use, disclosure, distribution, printing or copying of this e-mail is unauthorised. If you have received this e-mail in error, please immediately notify the sender by replying to this e-mail and delete the e-mail from your computer.

The contents of any attachment to this e-mail may contain software viruses, which could damage your own computer system. While ACCA has taken every reasonable precaution to minimise this risk, we cannot accept liability for any damage which you sustain as a result of software viruses. You should carry out your own virus checks before opening the attachment."

Appendix F: Descriptive statistics of overall sample

Digital literacy (N = 85)			
		Mean	Std.Dev
Internet usage frequencies	Several times in a day	1.02	.217
Communication methods	Fax	.25	.434
	Phone	.72	.453
	Mobile phone	.94	.237
	Chat room	.28	.453
	Surface mail	.18	.383
	Courier	.08	.277
	Email	.94	.237
	VOIP (e.g. Skype)	.49	.503
	Face to face	.91	.294
Digital literacy	How to download	1.02	.152
	How to send a file	1.07	.258
	How to open attachment	1.01	.108
	Name of search engine	1.08	.277
Internet skills	Not at all skilled	3.55	.716

Demographic (N = 85)			
		Mean	Std.Dev
Gender		1.42	.497
Accredited with	NZICA	.49	.503
	CPA	.21	.411
	Others (e.g. ACCA)	.33	.473
CPD requirement		1.07	.258
Training		1.47	.502
Education		1.96	1.117
Working		1.19	.393
Childcare		1.61	.490

Web 2.0 tools (N= 85)		
	Mean	Std.Dev
Blogs	3.82	1.082
Mash-ups	2.62	1.480
Microblogging	2.56	1.277
Podcasts	3.66	1.211
Prediction markets	2.68	1.311
Rating	3.34	1.402
RSS feeds	3.35	1.453
Social networking sites	4.39	.914
Tagging	3.71	1.361
Wikis	3.59	1.357

DL construct items (N= 85)		
	Mean	Std.Dev
Download (DL1)	1.02	.152
MP3 (DL5k)	4.44	.957
Preference setting (DL5ag)	3.54	1.460
Refresh/Reload (DL5ai)	4.29	1.132
Newsgroup (DL5aj)	3.34	1.368
PDF (DL5ak)	4.64	.595
Advanced Search (DL5al)	4.39	.914

Appendix G: Descriptive statistics for all items

Descriptive statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
PU1	34	3	7	5.44	1.021
PU2	34	3	7	5.47	.992
PU3	34	3	7	5.41	1.019
PU4	34	4	7	5.68	.843
PE1	85	1	7	4.91	1.087
PE2	85	1	7	4.80	1.163
PE3	85	2	7	4.80	1.153
PE4	85	1	7	4.69	1.354
EE1	85	2	7	4.91	1.007
EE2	85	2	7	5.19	.970
EE3	85	2	7	5.11	1.069
EE4	85	1	7	5.08	1.104
SI1	85	1	7	4.62	1.225
SI2	85	1	7	4.55	1.277
SI3	85	1	7	4.60	1.302
SI4	85	1	7	4.66	1.323
FC1	85	1	7	4.89	1.195
FC2	85	1	7	4.92	1.093
FC3	85	1	7	4.47	1.333
FC4	85	1	7	4.52	1.240
DL1	85	1	2	1.02	.152
DL5k	85	1	5	4.44	.957
DL5ag	85	1	5	3.54	1.460
DL5ai	85	1	5	4.29	1.132
DL5aj	85	1	5	3.34	1.368
DL5ak	85	2	5	4.64	.595
DL5al	85	1	5	4.39	.914
ADPT	85	1	2	1.60	.493
EC1	34	4	7	5.47	.861
EC2	34	4	7	5.47	.929
EC3	34	3	7	5.59	.957
S1	34	3	5	4.24	.654
S2	34	2	5	4.15	.744
S3	34	3	5	4.18	.673
S4	34	3	5	4.18	.716
CI1	34	4	7	5.76	.955
CI2	34	1	7	5.38	1.415
CI3	34	1	4	1.65	.981

Appendix H: Familiarity with Web 2.0 tools for overall sample

Web 2.0 tools (N= 85)			
		Frequency	Percent
Blogs	(No understanding) 1	3	3.5
	2	6	7.1
	3	22	25.9
	4	26	30.6
	(Full understanding) 5	28	32.9
Mash-ups	(No understanding) 1	31	36.5
	2	9	10.6
	3	18	21.2
	4	15	17.6
	(Full understanding) 5	12	14.1
Microblogging	(No understanding) 1	26	30.6
	2	10	11.8
	3	31	36.5
	4	11	12.9
	(Full understanding) 5	7	8.2
Podcasts	(No understanding) 1	7	8.2
	2	6	7.1
	3	21	24.7
	4	26	30.6
	(Full understanding) 5	25	29.4
Prediction markets	(No understanding) 1	22	25.9
	2	15	17.6
	3	25	29.4
	4	14	16.5
	(Full understanding) 5	9	10.6
Rating	(No understanding) 1	15	17.6
	2	6	7.1
	3	21	24.7
	4	21	24.7
	(Full understanding) 5	22	25.9
RSS feeds	(No understanding) 1	16	18.8
	2	7	8.2
	3	17	20.0
	4	21	24.7
	(Full understanding) 5	24	28.2
Social networking sites	(No understanding) 1	1	1.2
	2	3	3.5
	3	10	11.8
	4	19	22.4
	(Full understanding) 5	52	61.2
Tagging	(No understanding) 1	11	12.9
	2	5	5.9
	3	13	15.3
	4	25	29.4
	(Full understanding) 5	31	36.5
Wikis	(No understanding) 1	11	12.9
	2	6	7.1
	3	18	21.2
	4	22	25.9
	(Full understanding) 5	28	32.9

Appendix I: Seven-item digital literacy construct for overall sample

Digital literacy (DL) construct items (N= 85)			
		Frequency	Percent
Download	Yes	83	97.6
	No	2	2.4
MP3	(No understanding) 1	2	2.4
	2	4	4.7
	3	4	4.7
	4	20	23.5
	(Full understanding) 5	55	64.7
Preference setting	(No understanding) 1	13	15.3
	2	11	12.9
	3	7	8.2
	4	25	29.4
	(Full understanding) 5	29	34.1
Refresh/Reload	(No understanding) 1	6	7.1
	2	0	0
	3	9	10.6
	4	18	21.2
	(Full understanding) 5	52	61.2
Newsgroup	(No understanding) 1	11	12.9
	2	16	18.8
	3	11	12.9
	4	27	31.8
	(Full understanding) 5	20	23.5
PDF	(No understanding) 1	0	0
	2	1	1.2
	3	2	2.4
	4	24	28.2
	(Full understanding) 5	58	68.2
Advanced search	(No understanding) 1	2	2.4
	2	3	3.5
	3	4	4.7
	4	27	31.8
	(Full understanding) 5	49	57.6

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