

ICT Use by Greek Accountants

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ABSTRACT

This study investigates Greek accounting offices use of Information and Communication Technologies (ICT). Initially, a comprehensive questionnaire was developed. It contains 35 questions with multiple answers and 2 open questions tailored to the accountants. One hundred accountants' offices in a Greek county answered the questionnaire. The findings present their current ICT infrastructure and their use of ICT and accounting e-services. Greek accounting offices have made improvements in adopting new technology in their everyday work. All use email, antivirus software, and the Web. Most submit VAT (Value Aided Tax), Taxation Statements, and APS (Analytical Periodic Statement) via Internet. However, most are not cautious about backing up their data daily; they do not create electronic files for all their documents; they do not update their software via Internet; and they do not use advanced software applications. Finally, they expect the government and the Accountants' Chamber to finance their ICT infrastructure.

Keywords: accountants; computer use; e-accounting; e-finance; e-government; e-services; e-taxation; ICT infrastructure; Inland Revenue Services; Internet use; online tax filling.

INTRODUCTION

The profession of accountancy has experienced unprecedented change during the past 20 years. It has moved from paper-based to PC-based, and the Internet has become prevailing tendency. Similar to other professions in the service sector (Levy, Murphy, & Zanakis, 2009; Lexhagen, 2009), the recent technological developments have given accountants the opportunity to incorporate information systems in their profession. They use the PC, to a large extent, for customers' book keeping and liquidation of income tax statements. They spend a large amount of time processing and producing many documents (Bhansali, 2006a). Also, they use the Internet extensively for submitting tax statements to the government (Anderson, Fox, & Schwartz, 2005; Garen, 2006). The recent advances in e-government (Chatzopoulos & Economides, 2009; Economides & Terzis, 2008; Terpsiadou & Economides, 2009) have pushed accountants to follow. Furthermore, more than 2,000 accounting firms have Web sites registered with "The List of CPA Firms Directory" (Roxas, Peek, Peek, & Hagemann, 2000).

Many software packages are available to help accountants with book keeping. However, many of these software packages become quite complicated and present problems of interoperability and usability, among others.

Human-computer interface issues are extremely important for online service applications (Pinhanez, 2009). In parallel, many accountants lack the time or the patience to learn the skills needed to take full advantage of these advances. Even worse, the technology continues to move forward, getting more complicated and thus widening the gap between potential and actual use (Zarowin, 2004).

While technology's impact on the accountants' profession has been considerable, there are many more developments to come. Thus, accountants must be technologically proactive (Johnston, 2005). During the next few years, the profession of accountancy will face unexpected new challenges (Bhansali, 2006b).

This study investigates the level of ICT use by accounting offices in a Greek county. In the next section, previous studies on these issues are presented. Then the methodology is described. The presentation of the results follows. Finally, conclusions are drawn and future research is suggested.

PREVIOUS RESEARCH

Not many previous studies exist on the use of ICT by accounting offices. Some detailed studies were conducted by the American

Institute of Certified Public Accountants (AICPA).

Gallun, Heagy, and Lindsey (1993) distinguished between small and large public CPAs (Certified Public Accountants) and accountants in large enterprises (industry accountants) in the United States. They found that large accounting offices used more LANs (Local Area Networks) than small ones. Also, most accountants did not appear to worry very much about viruses and other security issues. Most used laser printers along with the essential dot matrix, and the most popular brand was Hewlett-Packard. Finally, a small percentage used portable printers.

Khani and Zarowin (1994) showed that 23% of enterprises in the United States supplemented all forms electronically (e.g., liquidation of income tax statements), and 15% planned to do it in the future. Regarding security, 31% faced virus problems. Also, 37% used an antivirus program, 68% of which used Norton. Regarding backup, 83% backed up their data, 80% of which did this daily and 16% weekly. E-mail was used by 39% of the offices.

Prawitt, Romney, and Zarowin (1997) classified U.S. accountants in the following categories: 1) in big accounting offices (Big 6—national), 2) in intermediate (regional) offices, 3) in small offices (local and individual offices), 4) in organisations (business and nonprofit), 5) in schools (academic), and 6) in governmental organisations. The most popular operating system was Microsoft Windows. All accountants in the first two categories used networks. The most popular application office suite was Microsoft Office (Word, Excel, Access, and PowerPoint). All accountants used applications for managing their contacts and timetables, and the most popular application was ACT! by Sage. (The small use of Microsoft Outlook was interesting.)

Bush (2000) found that 96% of U.S. accountants had access to the Internet. More than half reported that they “surf” every day. Also, 65% of men and 47% of women reported that the Internet created more opportunities for them. Finally, 47% expected an increase in using the Internet for accounting research.

Anders and Fischer (2004) found that the New York accountants were absolutely satisfied with the programs of accountancy that they used for third consecutive year. Also, an increase was observed in the creation of

Web pages by accountants aiming at the satisfaction of their customers.

Zarowin (2006) found that many accounting offices of all sizes transformed their offices to electronic ones. In 2003, only 38% prepared invoices electronically. In 2005, the percentage increased to 46%. In 2003, 64% used internal local networks (Intranets) for the storage and processing of customers’ data. In 2005, the percentage increased to 72%. Finally, the number of accounting offices that stored their customers’ documents only in the computer without printing them (electronic paperless office) showed an enormous increase of 103% from 2003 to 2005.

The use and development of Web pages for advertising by companies in the European Union during 2000–2003 increased, by 19% (Voiculescu, 2003). Advertising was the main reason for using and developing web pages (59%). It is remarkable that income acquisition was in third place (11%), behind customer service (26%).

Gullkvist and Ylinen (2005) found that the most important reasons for the development of e-accounting systems by Finnish accounting agencies were the following: more efficient use of time resources, higher internal performance, availability of accounting information, and perceived requirements from authorities. Lack of time can clearly been seen as one of the key obstacles delaying the adoption of the e-accounting systems among small and medium-sized enterprises.

The accountancy profession is feeling the strain of increased responsibility, away from the traditional roles for which accountants were trained (Intel International Group Ltd., 2005). Although the triggering factors for stress and increasing staff turnover are high, little is currently being done to improve the situation. A resounding 84% of U.S. companies said their accounting department was leading the compliance initiatives in the company. The same 84% stated that increasing compliance requirements have put them under greater pressure due to the increase in scope and volume of their work, and yet 88% were still manually re-keying data into spreadsheets for reporting and analysis (Intel International Group Ltd., 2005).

Although many Inland Revenue Service offices support electronic tax filling (Economides & Terzis, 2008), many accountants continue not to use these new electronic services. Each of the previous studies investigated only a specific area of

accountants' ICT use. For example, one study examined the types of networking technologies adopted; another examined the types of software used; and another examined the accountants' Web sites. Therefore, a comprehensive survey needed to be developed to capture the complete view of accountants' ICT use. Furthermore, most studies investigated accountants in the United States. Thus, a need also existed to investigate accountants' ICT use in other countries.

METHODOLOGY

Based on the OECD (Organization for Economic Co-operation and Development) (2002) model, our experience in surveying other services' areas, opinions of accountants after extensive discussions with them, and the previous studies presented above, we developed a comprehensive questionnaire to find out the utilization of ICT by accountants. Specially, fruitful discussions with members and officials of a local Accountants' Club helped us finalize the questionnaire.

We wanted to discover the ICT infrastructure that accounting offices in a Greek province owned and used. Also, we investigated what kind of accountant-specific software and e-government services the accountants used. We also wanted to identify the problems they faced in their daily accounting work regarding ICT. Suggestions to the Greek government and the Greek Accountants' Chamber could then be made.

The questionnaire contains 30 closed-type questions with multiple choice answers and 2 open-type questions. We classified the questions into four categories:

- 1) General information about the accounting enterprises (5 questions),
- 2) ICT infrastructure of the enterprise (18 questions),
- 3) Internet use and Web presence (4 questions), and
- 4) Accounting software applications and services (8 closed + 2 open questions).

One hundred twenty accounting offices are in the survey's region. The research was carried out at 100 accounting offices (private as well as belonging to enterprises) in this Greek county, using interviews at each office. The remaining 20 offices did not participate due to their lack of available time. We faced several obstacles in trying to interview the accountants due to their limited time.

We selected the specific survey's region because we have personal relationships with many accountants in this region, and expected that they would take the time to answer our questionnaire. During 2006–2007, we visited 75 offices and personally interviewed the staff. Twenty-five offices were interviewed by phone.

RESULTS

General information about the accounting enterprises

Most accounting offices (53) employed four to nine people, followed by offices (37) with less than three people. There were also 10 offices employing more than nine people.

Almost all offices (98) were autonomous private offices, while 2 were large enterprises. This was expected since most Greek accountants work mainly as free professionals, having their own private offices.

Most offices (63) were active in the profession for more than 15 years. Most (31) were active for 23 years. Only 13 offices were relatively new in the profession (less than 6 years).

ICT Infrastructure

As expected, all offices used Internet and e-mail, since they need to use the e-government services of Inland Revenue Service. Wide Area Networks (WAN) were only used by two offices, the large enterprises (Figure 1).

It is important to note that 63 offices set up LAN networks for better internal office operation. Considering the offices that have LANs, 21% employed 1–3 people, 62% employed 4–9 people, and 17% employed 10 or more people. This shows that the use of networks in small and medium-sized enterprises is becoming a necessity.

The number of PCs was proportional to the number of personnel. In particular, 58 offices owned 4–10 PCs, and 42 offices owned 1–3 PCs. However, no office owned more than 10 PCs although 11 offices employed more than 10 people. Not all personnel were concurrently working on PCs; some were occupied at exterior works (e.g., visiting the Inland Revenue Service, the Social Security Organization, and banks).

Out of the 63 offices that set up LAN networks, 21 used Client-Server technology and 42 used Peer-to-Peer (P2P) technology

(Figure 2). This was expected for such small LANs since the P2P networks cost less and do not require specialised personnel for maintenance. It is also noteworthy that among the 37 offices that did not set up any network infrastructure, 29 planned to set up one in the near future, while 8 did not.

Furthermore, 26 offices used a separate file server for central storage of all their files (in both Client-Server and P2P networks), 4 used Print Server (only in Client-Server networks), 12 used Backup Server (only in Client-Server networks), and none used Mail Server. Since most offices employed few employees, they usually met each other in person at the office. The 26 offices that used a file server realised that they were able to protect important files by placing them centrally and would not waste time updating the same data on separate PCs.

It is also interesting to note that among the offices that used Client-Server, 10% owned 1–3 PCs (Figure 3). Also, among the offices that used P2P, 62% owned 4–10 PCs. Accountants may not have been fully aware of the different benefits offered by each one of these networking technologies. Usually, an office imitates others and decides to invest in something others suggest. Cost is also a very important factor in this choice. Instead of buying a new server, many small offices transformed an old PC into a File Server.

The offices that did not plan to set up a LAN were small offices, usually with one PC and sometimes two or three. Roughly half of the offices that planned to set up a LAN owned 1–10 PCs (Figure 4).

Only 34 offices owned laptops apart from PCs. Some accountants worked from homes using laptops at these offices.

As expected, 92 offices owned Dot Matrix printers since printing is essential for their daily work, for example printing customers' books (Figure 5). It is interesting to note that 30 offices had black and white Laser printers and 16 offices owned colour Laser printers. These offices were mainly large offices with many customers, as well as the two big enterprises. More than half of the offices owned new multi-machines (fax, Inkjet printer, scanner together), which is economically sound for small offices. Forty-two offices owned old fax machines. The new offices preferred to buy multi-machines. Sixty-six owned inkjet printers, which are the most economical for printing a few pages. Seven offices owned separate scanners. Only 16

offices owned photocoppy machines (mainly big offices with many customers).

All offices used antivirus programs, while hardly any of the 76 offices used separate firewall programs apart from that included in Windows XP Operating System (Figure 6). Also, 12 offices used full data backup systems. These were mainly big offices and the two large enterprises, which had explicit backup policies. Due to the high cost of such technologies, the remaining offices did not use such technology. Instead, they used more economical ways of backing up their data. The offices that did not use a firewall program were mainly small offices with few PCs; they did not wish to purchase separate programs, since the firewall included in Windows XP worked well.

Regarding security problems faced by the offices during the previous year, 18 faced virus or spy-ware problems, 11 faced unauthorized access into their PCs, and 1 faced a program exploitation problem (Figure 7). The main reason for these problems was that despite being equipped with antivirus programs, they did not update these programs daily or, in some cases, even have the programs activated. The unauthorized access could be associated with the fact that most offices did not use password and user name to log into Windows.

Seventy-nine offices backed up their critical data daily, 11 did this weekly, and 10 did this monthly (Figure 8). They claimed that the main reason for not backing up daily was the lack of time and their belief that it is not important to back up daily.

Regarding the media used for back up (Figure 9), most offices (86) backed up on the local disk (another partition or another file), 16 used a backup server, 8 used the old zip-drive, and 29 offices used CD-DVD. Twenty-one offices used more modern methods such as USB flash disk and external USB hard disk. Only two offices knew about and had a complete image backup of their hard disk. These two offices were small with less than people people, but these workers were young and familiar with new technology.

As expected, they used Microsoft's software for general use. They used Windows XP as the operating system, and the Microsoft Office 2000–2003 as their office suite. Most companies did not know about open source software.

Sixty-eight offices used password and user name to log in to the Windows system. The remainder 32 offices were mainly small offices

with few PCs, and they did not consider it essential.

Regarding problems due to introducing ICT into their enterprises, 18 offices considered, as a problem, the lack of information and knowledge about ICT; 16 offices had problems with the terminology; and 13 offices were burned up by the time-consuming procedures (Figure 10). However, it is interesting to note that most offices (58) did not face any particular problem, and 5 offices were not interested in any of these problems. (Most offices were staffed by young accountants who eagerly follow any new technological innovations.)

Regarding the use of VoIP (Voice over Internet Protocol) technology, only four offices had used Skype (Figures 11 & 12). Most offices declared that this technology is still unreliable, and they will wait until it becomes perfect to use it again. Sixty-seven offices said they had not used it but intended to do so in the future, while 23 offices declared that they did not intend to use it at all. Their reasons for not using VoIP were that this technology is still new, unreliable, and there is no sufficient information about it. At that time, only two Greek telecommunications companies provided VoIP in parallel with other services, and they did not advertise it enough. Sixteen offices declared that they were not interested in this new technology.

Regarding their degree of familiarization with ICT and their continuing training policy, most offices (58) maintained a continuous training policy and were very familiar with ICT (Figure 13). In these offices, most accountants recognized the benefits of ICT. Internet explosion helped immensely. On the other hand, a few offices (eight) hesitated to use ICT. These were mainly old offices with elderly accountants, who could not keep pace with the new technologies and simply used only the essential items for their daily work. Sixty-four offices were very familiar with ICT, but they did not have any training policy, which happens mainly in small offices with one or two people.

Regarding their expectations of their Chamber (oe-e.gr, pol.org.gr) or the government, 71 offices wished to be financed to purchase or use new ICT products (Figure 14). Accountants were willing to use the new technologies, but they needed money to proceed.

Internet use and Web presence

In this section, we present the results of our research on accountants' Internet use. It is important to note that a Greek accounting office should have an Internet connection to connect to the Inland Revenue Service (TAXIS NET: www.taxisnet.gr). Forty-three offices used ISDN (Integrated Services Digital Network), while 53 offices adopted the new ADSL (Asymmetric Digital Subscriber Line) technology (Figure 15). However, four still used simple PSTN (Public Switched Telephone Network) connections via modems; these offices are small and staffed by elderly accountants who did not wish to upgrade their infrastructure. No office used wireless or satellite connections.

More than half of the offices used an ADSL connection due to the aggressive policy of the main Greek telecommunication company (OTE). Recently, OTE lowered the price of ADSL, making it affordable for any office. Correlating these results with their upgrading plans, we see that most of the 53 offices that planned to upgrade their Internet connection used ISDN. Accountants also embraced ADSL technology because it was economically and technically accessible.

Only three offices had Web sites, which were developed by external personnel and hosted by an ISP server. Most accounting offices did not exclusively employ ICT specialists or an ICT service company, because they believed they needed a Web site only for advertising purposes. However, they did not consider this function essential. This conclusion is also supported by the fact that only five offices planned to create Web pages in the near future.

As we have mentioned, an accounting office must have an Internet connection for transactions with public services, such as the Inland Revenue Service. Consequently, all offices said the main reason they used the Internet was to communicate with public services and ministries (Figure 16). Thirty-four offices also cited e-banking as a reason for their Internet use. Fifty-eight offices used the Web to find information.

They rated the problems that affect their Internet use equally (Figure 17). These problems were related to security, complicated technology, Web site cost, loosing time in surfing, communication costs, and slow and unstable data communications. Most offices (47) considered these problems serious, 37 considered them fair, and 13 did not care.

Therefore, most accountants were hesitant about the Internet.

Accounting software applications and services

In this section, we report on the accountants' use of accounting software and related services.

The usual work of a Greek accountant is the book keeping of A and B categories. In the Greek market, there are software packages operating in a network environment that are useful for this purpose. These software packages can be used simultaneously by several people, depending on the licence. In 63 offices, such software packages were used by two or more people in a network environment. In the remaining 37 offices, a single person used them. This occurred mainly in small offices.

In Greece, all enterprises are obliged to send a VAT (Value Added Tax) statement periodically (every quarter for A & B categories) to the Inland Revenue Service. According to existing legislation, accountants do not have to send these statements electronically via TAXIS NET even if such possibility is provided. Most offices (82) periodically sent the VAT statement electronically, exploiting the electronic services offered by the state. Few offices (18) submitted their statement in person to the Inland Revenue Service.

While almost all of these software packages support data exchange with MS Office, no office used this feature. The accountants may not have known about this possibility or did not need it.

Although these software packages could be upgraded via the Internet, in real time (live update), most offices (61) did not download the new versions. They may have not been familiar with this process, or they did not know it existed. On the other hand, 26 offices checked for new versions once per month, and 13 offices did so daily.

When we examined the types of printers used to print out reports from these software packages, we found that 92 offices used all varieties. Eighty-nine did this daily and three did weekly. The remaining eight offices, which are small offices, owned and used only one printer (Figure 18).

Next, we investigated the book keeping of C category. Large enterprises, with high turnover, must keep C category books. Thus,

the book keeping of C category is mainly done by large offices with much experience. Regarding the simultaneous use of software packages by two or more people, we have the same results as the book keeping of A and B categories, that is, accountants used networking technology. Sixty-three offices used this technology daily and 37 never. In these 37 offices, offices were included that did not serve customers of the C category.

None of the offices used the software's ability to connect to MS Office. For C category book keeping, accountants must frequently update their software packages. In terms of upgrading via the Internet in real time, 53 offices never updated in this manner, 13 monthly, 5 weekly, and 29 daily. Regarding printing work related to C category book keeping, 66 offices, with many of these customers, printed daily. However, 28 offices did not have such customers and therefore did not need to print this work, 3 offices printed a few times per month because they had one or two such customers, and 3 offices printed a few times per week (Figure 19).

Only eight offices used CRM (Customer Relationship Management) systems daily, and the remaining 92 offices did not know about CRM. These eight offices were mainly large offices with many customers. Similarly, only the two large enterprises used ERP (Enterprise Resource Planning) systems daily (Figure 20). Only large companies with a specialized accountants' section used ERP.

On the matter of payroll services in Greece, all enterprises that pay personnel are obliged to send the APS (Analytic Periodical Statement) to the Organisation of Social Security (IKA) every month. IKA offers accountants multiple ways to submit this statement. Currently, the two most popular methods are: 1) creating a compatible file using the payroll program and sending it to IKA, and 2) typing the elements into suitable forms on the Web site of IKA (www.ika.gr) and completing the sending of APS (Analytic Periodical Statement). The first method is used by 92 offices monthly (Figure 21). The second method is used by 71 offices monthly. Eight offices did not use any payroll software.

Three offices upgraded their payroll software online daily, 87 monthly, and 10 never.

Concerning electronic communication with banks or other institutions of social insurance (as well as the exchange of electronic data), 79 (respectively 82) offices

never had such interactions, 10 (respectively 8) monthly, and 11 (respectively 10) daily (Figure 21).

Ninety offices used Windows-based accounting software whereas only three used the old DOS-based software. Greek accounting software companies helped by adapting their products to new technological innovations.

Figure 22 shows the specific accounting software programs offices used. UNION is used by 37 offices, while SINGULAR is used by 24. EPSILON-net is a powerful program, but it is more expensive; therefore, it is used by only 12 big companies.

However, accounting offices did not utilize the new ways of upgrading their software. Seventy-nine upgraded via post (CD) (Figure 23). Although new technology is available, many offices insisted on using old methods. Eight offices upgraded their software directly via the Internet (live update) over a broadband Internet connection, and 34 offices upgraded after downloading and installing the update file.

The accountants kept themselves informed about new developments in their profession via multiple means. Ninety-two offices read periodicals, 53 offices read TaxHeaven (www.gus.gr), 37 offices read e-Forologia (www.e-forologia.gr), 26 offices read the online e-magazine EPSILON7 (<http://www.epsilonnetwork.gr/epsilon7>), and 29 offices were informed by discussions in various forums (Figure 24). Thus, many accountants were informed not only through traditional written press but also via the Internet.

As we have reported, many accountants used the new e-services provided by TAXIS NET. Although sending VAT statements regarding the A and B book keeping categories electronically is not mandatory, 92 offices did in this manner. Also, 95 offices sent their customers' final Taxation Statements to TAXIS NET. The accounting offices realized the benefits of using the new online services that the government provided (Figure 25).

Finally, Greek accountants were not familiar with the "paperless office" that prevails in the United States. Only two offices created an electronic file for each customer by scanning the forms and storing them in e-files. Also, no office could send invoices to their customers in electronic form. Instead, they preferred to key the invoices' data into the corresponding software. They did not use these technologies because 76 offices did not

consider them to be important, and 50 did not have much time for such work (Figure 26).

Finally, almost all offices considered the following factors very important for their software packages: convenience of learning, ease of use, reputation of the software's company, live update ability, specifications and functions, customer support, user friendliness, and online service (Figure 27).

CONCLUSIONS

The purpose of this study was to provide insights into the level of ICT use by the accounting offices in a Greek county.

The Greek state provided various e-government services to accountants, which urged the accounting offices to use and develop an ICT infrastructure. Various Greek public organizations provide e-services. For example, the Ministry of Finance has the Web site for TAXIS NET (www.taxisnet.gr) and the Ministry of Employment provides the Web site for IKA (www.ika.gr). These e-government services help accounting offices to save time and better serve their customers.

The findings from this survey show that the accounting offices in a Greek county kept pace with ICT technological innovations. For example, Internet was widely used by them. However, elderly accountants seemed to be more resistant to adopt the new technologies.

Briefly, the positive points were the following:

- Many (63) offices set up a LAN, and 29 of the remaining offices planned to do so in the future. The accountants recognized the benefits of having a LAN in their enterprise. Software companies helped with this implementation by allowing their programs to be used in a network environment without extra cost.
- All the offices had antivirus programs for their PCs.
- Few (18) offices faced viruses' problems during the past year.
- Many (58) offices did not face any problems using ICT.
- Many (82) offices used the electronic submission of VAT (in A and B category book keeping) via TAXIS NET, which is not mandatory.

The negative points were the following:

- Few (26) offices used separate file servers to store their data.

- Few (12) offices used complete backup systems for their data.
- Only 79 offices backed up their data daily.
- Very few (2) offices had a complete image backup of their hard disk.
- Very few (4) offices used VoIP for small time duration. They said this service was unreliable, and they did not have much information regarding how to use it.
- Many (43) offices still used the old ISDN Internet connection, although the prices of ADSL had fallen enough to be economically comparable with ISDN.
- Very few (3) offices developed their own Web site.
- Very few (8) offices used CRM programs for daily operations.
- Still, 3 offices used DOS-based professional applications.
- Many (79) offices upgraded their software packages via post (receiving the upgrades in a CD), although almost all software packages had live update ability.
- Very few (2) offices created electronic files of their customers' documents (paperless office).

Although there were two open questions, many accountants did not make any suggestions but the following suggestions were made:

- Enable direct and complete interconnection between their software programs and the public e-services of the Inland Revenue Service (TAXIS NET) and the Organisation of Social Security (IKA) without having to type the same data into forms on the these Web sites. Currently, this ability is provided for some services.
- Provide the possibility of sending a customer's first VAT statement electronically. Currently, a new customer should record his first statement in person with the Inland Revenue Service. Afterward, he can send the statements electronically.
- Provide the possibility of sending the liquidation VAT statement electronically via the Internet. Currently, a pilot project offers this ability.
- Training on accounting software should be offered by the software companies not only in Athens (the capital of Greece) but also in the province.

Limitations of this study include the specific province and country sample of the accounting offices. A future study could cover all Greek regions, as well as other countries. Also, a cross-sector comparison with

enterprises in other service professions could be made. Nevertheless, we hope that the results of this study provide an insight into the use ICT and electronic services by Greek accountants. These results could be a starting point for further research in this area.

REFERENCES

- Anders, S. B., & Fischer, C. M. (2004). A hard look at tax software: 2004 survey of New York State practitioners. *The CPA Journal*. Retrieved October 14, 2006, from <http://www.nysscpa.org/cpajournal/2004/704/jnfocus/p18.htm>
- Anderson, T., Fox, M., & Schwartz, B. N. (2005). History and trends in e-filing: A survey of CPA practitioners. *The CPA Journal*. Retrieved October 14, 2006, from <http://www.nysscpa.org/cpajournal/2005/1005/essentials/p66.htm>
- Bhansali, C. (2006a). The question every practicing accountant must ask. *Accounting Technology*, June. Retrieved March 22, 2007, from <http://www.webcpa.com/>
- Bhansali, C. (2006b). A partial solution to a Daunting problem. *Accounting Technology*, September. Retrieved March 22, 2007, from <http://www.webcpa.com/>
- Bush, C. T. (2000). Accountants are thriving on the Web, says survey. *Journal of Accountancy*, 190(5), 20. Retrieved November 23, 2006, from <http://www.aicpa.org/PUBS/JOFA/joiaiss.htm>
- Chatzopoulos, K. C., & Economides, A. A. (2009). A holistic evaluation of Greek municipalities' websites. *Electronic Government, an International Journal (EG)*, 6(2), 193-212.
- Czech Statistical Office. (2002). *Technology used by enterprises*. Retrieved October 11, 2006, from http://www.czso.cz/eng/edicniplan.nsf/o/9602-04-2003-1_technology_used_by_enterprises
- Economides, A. A., & Terzis, V. (2008). Evaluating tax sites: An evaluation framework and its application. *Electronic Government, an International Journal (EG)*, 5(3), 321-344.

Gallun, R. A., Heagy, C. D., & Lindsey, H. C. (1993). How CPAs use computers. *Journal of Accountancy*, 175(1), 38-41.

Garen, K. (2006). Driving the firm of the future. *Accounting Technology*, June. Retrieved February 9, 2007, from <http://www.webcpa.com/>

Gullkvist, B., & Ylinen, M. (2005). E-accounting systems use in Finnish accounting agencies. In M. Seppä, M. Hannula, A-M. Järvelin, J. Kujala, M. Ruohonen, & T. Tiainen (Eds.) *Frontiers of e-Business Research. Proceedings of the e-Business Research Forum 2005* (pp. 109-117). Tampere, Finland: e-Business Resilience Centre.

Johnston, R. P. (2005). A tour of tomorrow's technology. *Journal of Accountancy*, 200(4), 95-97. Retrieved November 23, 2006, from <http://www.aicpa.org/PUBS/JOFA/joaiss.htm>

Khani, P. E., & Zarowin, S. (1994). The technology used by high-tech CPAs. *Journal of Accountancy*, 177(2), 54-58.

Levy, Y., Murphy, K. E., & Zanakis, S. H. (2009). A value-satisfaction taxonomy of IS effectiveness (VSTISE): A case study of user satisfaction with IS and user-perceived value of IS. *International Journal of Information Systems in the Service Sector*, 1(1), 93-118.

Lexhagen, M. (2009). Customer perceived value of travel and tourism web sites. *International Journal of Information Systems in the Service Sector*, 1(1), 35-53.

Mintel International Group Ltd. (2005). Retrieved October 14, 2006, from <http://www.mintel.com>

Organization for Economic Co-operation and Development. (2002). *The OECD model survey of ICT usage in the business sector*. Retrieved September 8, 2006, from <http://www.oecd.org>

Pinhanez, C. (2009). A service science perspective on human-computer interface issues of online service applications. *International Journal of Information Systems in the Service Sector*, 1(2), 17-35.

Prawitt, D., Romney, M., & Zarowin, S. (1997). A journal survey: The software CPAs use. *Journal of Accountancy*, 183(2), 52-66. Retrieved November 23, 2006, from <http://www.aicpa.org/PUBS/JOFA/joaiss.htm>

Roxas, M. L., Peek, L., Peek, G., & Hagemann, T. (2000). A preliminary evaluation of professional accounting services: Direct marketing on the Internet. *Journal of Services Marketing*, 14(7), 595-605.

Terpsiadou, M. H., & Economides, A. A. (2009). The use of information systems in the Greek public financial services: The case of TAXIS. *Government Information Quarterly*, in press.

Voiculescu, A. (2000). *Strategic implications of electronic commerce for UK businesses*. Retrieved October 14, 2006, from <http://www.aurelvoiculescu.com/>

Zarowin, S. (2003). Hot stuff: What you need and what you don't your technology setup may be sufficient for your needs. *Journal of Accountancy*, 195(4), 28. Retrieved November 23, 2006, from <http://www.aicpa.org/PUBS/JOFA/joaiss.htm>

Zarowin, S. (2004). Top tools for CPAs: Technology products that make your work go faster and smoother. *Journal of Accountancy*, 194(5), 26. Retrieved November 23, 2006, from <http://www.aicpa.org/PUBS/JOFA/joaiss.htm>

Zarowin, S. (2006). Rate yourself in the paperless race: Have you overcome your resistance to the new technology? *Journal of Accountancy*, 201(5), 50-54. Retrieved February 17, 2007, from <http://www.aicpa.org/PUBS/JOFA/joaiss.htm>