

An investigation on the impact of Information Technology in accounting firms

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Date: 29th July 2011

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Word Count: 15,139

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Abstract

This study explores the impact of Information Technology in accounting firms. The study investigates different issues that have an impact on Information Technology in accounting firms including: productivity; performance; accuracy; cost; time; output and quality.

The study will evaluate the influence Information Technology has inflicted on each of these components within accounting firms. Academic studies and critiques will be explored in relation to the use of Information Technology in accounting firms. The structure of the study will be underpinned by the exploration of various data collection methods.

Additionally, the study will hope to exhibit the diverse aspects of using Information Technology in accounting firms.

Acknowledgements

Several people have been of great help assisting in the completion of the project. I would like to take this opportunity to express my sincere gratitude to the following people:

- Mr. Simon Stephens for his guidance and support during the research and the compilation of this thesis.
- My research lecturers – Deirdre McClay and Suzanne Roarty for their guidance with the research methodology during the year.
- The partners and employees of the accounting firms who took the time to participate in the interview and complete the questionnaire.
- My parents for their encouragement and support throughout the year and for proof reading this thesis.
- John Gallagher for proof reading this thesis.
- Finally, my family and colleagues in the masters class of 2011 for making it a memorable year.

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Chapter 1 – Introduction

1.1 Background Information on research topic

The accounting profession has experienced considerable change over the past number of years. Banker et al. (2002:209) states that “public accounting underwent tremendous changes at the turn of the millennium, sparked largely by the rapid changes in its IT environment.” The use of computers has affected the majority of modern industry as they are seen to be economically beneficial and they contribute to the complementary innovations. There have been previous studies which have looked at the various opinions and views of the impact of Information Technology in accounting firms. Perceptions on the impact of Information Technology in accounting firms has been cited by several authors including Garen (2007), Devaraj and Kohli (2003), Powell (1992) and Banker *et al.* (2002) as a positive factor which will improve performance within an accounting firm. In contrast there are authors who view the impact of Information Technology as negative including Bharadwaj *et al.* (1999), Stone and Henry (2003), Ezzamel *et al.* (1997) and Xiao *et al.* (1997). Brynjolfsson and Hitt (2000:24) state that “the massive reduction in computing and communications costs has engendered a substantial restructuring of the economy.” This research will take into consideration all the factors aforementioned and the factors will be explored in detail in chapter two; the literature review section.

1.2 Aims and objectives of the research

The primary aim of this research is to understand the impact of Information Technology in accounting firms. The objective of this research is to find out the impact of Information Technology in accounting firms and to measure its impact on a firm's performance and productivity. The objective of the research is consistent with that of Banker *et al.* (2002) who focus on the impact of Information Technology on public accounting firm productivity. The resulting question is as follows: Does Information Technology help to improve performance within an accounting firm? This can be broken down into the following sub-questions:

- Does the use of Information Technology increase the productivity of the firm?

Prior research such as the study carried out by Banker *et al.* (2002) suggests that the use of Information Technology increases the productivity within a firm. However, the objective is to determine whether these findings can be replicated in Letterkenny.

- Does the use of Information Technology result in the reduction of the number of employees within a firm?

Previous studies carried out by Brynjolfsson *et al.* (1994) and Ezzamel *et al.* (1997) argue that the use of Information technology results in a decline in a firm's size. However, this decline takes place gradually and its impact is not felt immediately.

- Does the firm believe that the introduction of Information Technology is very expensive?

In the current economic climate, many businesses feel the pressure financially and are taken severe measures in order to survive. The aim of this research is to determine whether Information Technology has an impact on the financial section of the business and whether firms believe that they should reduce the usage of Information technology.

- Does the use of Information Technology improve accuracy?

Previous research indicates that the use of Information Technology supports accountants in relation to the analytical and decision making decisions. Ezzamel *et al.* (1997) note that Information technology can be seen as improving accuracy when producing accounts.

- Does the use of Information Technology reduce the time needed to prepare accounts?

Banker *et al.* (2002) suggest that the use of Information technology reduces the time needed when preparing accounts as the numbers are generated automatically and cross-referenced.

- Does the firm have difficulty in justifying the need for Information Technology?

Prior research such as the one carried out by Powell (1992) indicates that the use of Information Technology and its impact on a firm's performance is not always observable which can be hard to justify.

- Does the use of Information Technology result in the improvement of output and quality?

Mukhopadhyay *et al.* (1997) carried out a study on the impact of Information Technology on a firm's output and quality and the results suggest that it has improved the output and quality.

Previous research suggests that Information Technology has a positive influence on an Accounting firm's for example it improves accuracy, reduces the time needed to prepare accounts and it results in the improvement of output and quality. Therefore the aim of this research is to determine whether these findings can be replicated within accounting firms in Letterkenny. The research question and sub-questions were chosen as they are not too broad or too narrow therefore will act as a focus for the research. Furthermore, it is expected that the questions will lead to observable outcomes (Saunders *et al.* 2003). It is envisaged that the research question and sub-questions will be achieved by the combination of the literature review and data collection. The data collection will consist of questionnaires and interviews

1.3 Rationale for the paper

In relation to the importance of this research, it is expected that it will be relevant to the researcher, accounting firms and the education sector. It is envisaged that the results of this research would provide valuable feedback to present and future accounting firms. This research is applicable to accounting firms in Letterkenny, however it may also add to the collective knowledge on the impact of Information Technology in accounting firms in Ireland. It will be of benefit to new accounting firms setting up and those firms who are contemplating about becoming more technology based. It should enable the accounting firms to make a decision on whether to

increase or decrease investments in Information Technology. Furthermore, the results of the research should benefit the education both at secondary level and third level as it should give an indication whether or not they should focus more on Information Technology in relation to accounting. The findings will be of interest to academics and postgraduate students.

1.4 Potential limitations of this research

Many approaches to data collection and research have limitations. Saunders *et al.* (2009:278) state "that the financial criterion for assessing secondary data is a comparison of the costs of acquiring them with the benefits they will bring." Firstly, there is only one academic year to complete the research therefore there may be time and financial constraints. Secondly, in relation to questionnaires and interviews, bias is a concern. Thirdly, there is an issue when assessing the impact of Information Technology in accounting firms as the usage of it may vary from business to business (Devaraj and Kohli 2003). Fourthly, the usage of Information Technology may vary between different time periods for the same business. The solution is to measure the usage of Information Technology in accounting firms with actual performance and productivity.

Chapter 2 – Literature Review

2.1 Introduction

This chapter reviews literature in relation to the factors which contribute to the impact of Information Technology in accounting firms. The section contains seven sub-sections which are: introduction; Information Technology; and modern business; accounting firms; the link between Information Technology and accounting firms; education in relation to Accounting and Information Technology; previous studies in relation to Information Technology in accounting firms; and perceptions on the impact of Information Technology in accounting firms. This stage of reviewing literature is desk research which consists of reviewing literature from various sources such as books, academic journals, discussion papers and publications. This phase of the research is exploratory in nature. There are many different opinions in relation to the impact of Information Technology in accounting firms which are described by the various authors including Garen (2007), Devaraj and Kohli (2003), Powell (1992), Banker *et al.* (2002) Bharadwaj *et al.* (1999), Stone and Henry (2003), Ezzamel *et al.* (1997) and Xiao *et al.* (1997) and Brynjolfsson and Hitt (2000).

2.2 Information Technology and modern business

Information Technology is “hardware, software and related technical routines, and information systems (IS) to organisational applications, increasingly IT-based, that deliver in the information needs of an organisation’s stakeholders” (Willcocks and Lester 1997:1082). This definition is suitable as it modern and includes everything that relates to Information Technology. Information Technology which can also be defined as computers and any related digital communication technology has the power to reduce the costs of information processing, communications and

coordination. This research focuses on computer based Information Technology.

Information Technology is changing rapidly. The management of Information Technology today is in contrast with management in the 1980s and 1990s. At present, the Information Technology environment is networked, systematically connected and ubiquitous. However, in the 1980s and 1990s the Information Technology environment was centralised and distributed. As a result businesses are challenged to perform differently than in the past from selecting and designing systems to implementing and evaluating systems (Gingrich 2003). Businesses respond in various ways and at different rates to the range of technologies available. Increasing competition demands that firms need to maximize their competitiveness by effectively updating or using new technologies. Alles *et al.* (2000:15) articulate that the “emerging trends in technology will fundamentally alter the way in which both business and accounting will be conducted” in the future. Perceptions of the quality of Information Technology are based more heavily on the perceptions on the performance rather than the range of changes in relation to Information Technology (Kangas 2003). Recently, an extensive growth in Information Technology investment has occurred and it is viewed as a key part for a firm’s success. It is believed that investments in Information Technology will increase value to the business improving both efficiency and effectiveness. However, there are concerns that the benefits may not be as high as expected therefore evaluation of Information Technology becomes a major concern (Davis 2003). The adoption of Information Technology in businesses and organisations facilitates in learning about new management practices, management strategies and new markets (Fung 1999). White and Bruton (2007) explain that the root of business today is driven by Information Technology and its application. Information Technology has reduced cost and time of interacting with suppliers and clients. However, Stone and Henry (2003) argue that unethical business behaviour is increasing and Information Technology may be one of the contributing

factors therefore sound ethical practices relating to the use of Information technology is vital within a business and society as a whole. Information Technology has different impacts on business applications.

2.3 Accounting firms

An accounting firm is responsible for providing trustworthy information about financial records. This might involve them in financial reporting, auditing, taxation, business recovery and insolvency, corporate finance, forensic accounting or accounting systems and processes. The aim of an accounting firm is to provide professional advice, aiming to maximize profitability on behalf of their employer or client. Recently, there has been a significant change in accounting firms as the majority of them focus on computer based applications such as Revenue Online Service, Sage and Microsoft Excel. Ezzamel *et al.* (1997:446) reflect on the way accounts were prepared previously as "the cost analysis and tools of trade were a big sheet of analysis paper and a pencil with an eraser." The new developments in Information Technology have led to significant savings in the accounting function. Fung (1999) reports that accountants are faced by various challenges in the 21st century as a result of customers becoming more knowledgeable and the technological changes that are taking place. To survive this rapid changing economy, accountants need more imaginative strategies, faster decisions and to become more flexible.

2.4 The link between Information Technology and accounting firms

Information Technology is seen as affecting the role of an accountant creating new challenges and opportunities (Lamberton *et al.* 2005). It has changed the way accounting firms do everything from hiring and retaining employees to communicating with clients. Businesses are expecting professional accountants to possess exceptional Information Technology

skills. The rapid changes in hardware, software and networking technologies create difficulties for accountants who need to understand the implications of these advancements. Wallman (1997:108) illustrates that "in order to provide useful information optimally, accounting must change with the developments in technology." Wheeler *et al.* (2004) propose that individuals who train to become an accountant may not feel comfortable with learning all the computer based skills and challenges that they face. To become a professional accountant, it is a requirement to have relevant knowledge about computer applications to provide high quality and valuable information to their employer or clients. Each new Information Technology application generates opportunities to improve data quality and process efficiency for accountants to understand and address.

Additionally, Information Technology is seen as rapidly changing the "landscape in business by reducing the significance of the traditional scorekeeping role of the accountant while increasing uncertainty and complexity in the workplace" (Lamberton *et al.* 2005:78). Several organisations have an individual in charge of monitoring the trends and new emerging technologies that take place which could affect business processes or financial reporting. Numerous studies have measured the complements of organisations directly and examined whether they are linked with Information Technology investment or whether it contributes to economic performance. Brynjolfsson and Hitt (2000) investigated the complementary system of Information Technology and the organisation. After surveying four hundred large firms, they found that the most significant levels of Information Technology are associated with levels of skill and education in the workforce therefore they increase delegation of authority to teams and individuals. The results indicated that Information Technology and organisations are part of a complementary work system. Businesses who have adopted Information Technology applications within their organisations often find that their investment balances the changes in other aspects of the organisation which gives positive implications in understanding the value of

computer investment within a firm (Brynjolfsson and Hitt 2000). It is estimated that emerging trends in Information Technology will alter the way in which accounting and business will be conducted in the future (Alles *et al.* 2000).

2.5 Education in relation to accounting and Information Technology

This section covers accounting education in Ireland at second level and third level. It will explore the current state of accounting while also taking into consideration the use of Information Technology within second and third level education. At present, accounting has become more technology based and students are educated towards this in schools and colleges.

2.5.1 Second-level education

Second level education in Ireland consists of students from the ages of twelve to eighteen. Prior to 1969, there was only one business subject examined in the leaving cert program. However, it was recommended to create a group of business related subjects such as economics, business studies and accounting. Accounting was introduced into the leaving certificate program in 1969 and was first examined in 1971. The new accounting syllabus was revised in 1995. New topics were added such as computer applications and Information Technology. Information technology in Ireland is not examined at second-level; however it is integrated in other subjects such as Accounting. Furthermore, there is an option for students to complete courses in relation to Information Technology at second-level such as ECDL. Kopel and Dudley (2003) reflect on the use of the internet in the classroom and clarify that it gives accounting students a greater understanding of the material they are covering such as the use of Microsoft Excel. In second-level institutions, there are difficulties in relation to the financial aspect of integrating technology into education so therefore it is necessary to identify

the most cost effective methods for using Information Technology in education.

2.5.2 Third-level education

Third-level institutions in Ireland consist of institutes of technology, universities, colleges of education and a number of independent private colleges (Byrne and Flood 2003). The vast majority of entrants into third-level education in Ireland are school-leavers. Business facilities within the third-level education were introduced under the Irish Universities Act 1997 (Byrne and Flood 2003). In the past, third-level colleges had been faced with the difficulty of integrating Information Technology related subjects within the accounting curriculum. However, many colleges have now designed a new degree program which focuses both on accounting and Information technology. Accounting related subjects in third-level institutions which focus on Information Technology include information security and controls, e-commerce, electronically based financial reporting and training and technological competency (Watson *et al.* 2007).

There are suggestions that linking both Information technology and accounting at second-level and third-level may be difficult to teach as it requires a different approach. A study carried out by Chang and Wang (2003) described that auditors who enter the workplace had more Information technology exposure than current auditors who had been into the workforce a number of years. This study also focused on educators and the results indicated that educators had difficulty finding time to cover all the relevant topics. Furthermore, educators felt there was a need to increase and develop their expertise in relation to Information Technology. Marriott *et al.* (2004) investigated the views of students in relation to the use of Information Technology in accounting programs in third-level institutions. The investigation was carried out in two UK universities. The results showed that there has been a considerable increase in internet and email usage.

Furthermore, it was reported that the male population within these universities had a higher general ledger, spreadsheet, word processing and computer use. However, it was noted that the students preferred face-to-face form of education and would only approve of Information Technology and internet usage during the delivery of courses.

The studies in relation to education have influenced the project design of this research. The in depth interviews will address the training of Information Technology in accounting firms and whether staff members had previously been exposed to it before at second and third level.

2.6 Previous studies in relation to Information Technology in accounting firms

There are numerous articles and studies in relation to Information Technology in accounting firms. These studies relate to the objectives of this research including the impact of Information Technology on the performance of an accounting firm; the impact of Information Technology on the productivity of an accounting firm; the impact of Information Technology on an accounting firm's size; the impact of Information Technology on an accounting firm's output and quality and justifying the need for Information Technology in accounting firm's.

2.6.1 Performance

Devaraj and Kohli (2003) explored the relationship between organisational performance and investment in Information Technology. The effect of the Information Technology usage on profitability and quality was examined on a cross sectional set of hospitals combined with time series data. The results of this study were analysed on a statistical bases. They indicated that there was general support in relation to the statement "that the greater the actual

usage of technology, the better the financial and quality performance of hospitals” (Devaraj and Kohli 2003:285).

Similarly, Bharadwaj *et al.* (1999) investigated the impact of Information Technology on a firm’s performance. This study identified arguments for and against the use of accounting measures of performance particularly relating to the insensitivity of time lags. Bharadwaj *et al.* (1999) used Tobin’s *q* measure of performance as their dependent variable. Bharadwaj *et al.* (1999) defined *q* ratio as “a predictor of a firm’s future investments.” This ratio has been used previously as a predictor of profitable investment opportunities, an alternative measure of business performance, a measure of returns from diversification and measure of brand equity. There were only two sources of data in relation to computer budgets and Information Technology budgets. The data collection method used was the annual survey of chief information systems executives conducted by Information weekly magazine because of the larger sample of available data. The results indicated that Tobin’s *q* provided an appropriate measure in relation to Information Technology’s impact on firm’s performance as it avoided many of the shortcomings of accounting based profit ratios.

Additionally, Willcocks and Lester (1997) examined the relationship between Information Technology performance and its evaluation. Willcocks and Lester (1997) carried out several studies including a survey which was carried out amongst 150 senior Information Technology managers which attracted 70% response rate. The sample was taken from a cross section of the main economic sectors including financial services, pharmaceuticals, energy, manufacturing, publishing and private sectors. The results concluded that two thirds of the Information Technology departments admitted that they had incurred uncertainty when demonstrating the effectiveness of Information Technology services. In contrast, the overall contribution of Information technology to a business was the principal focus in 16% of the organisations.

Furthermore, Harris and Katz (1991) evaluated the relationship between organisational performance and two measures of Information Technology investment intensity among systems technology leaders in the life insurance industry between 1983 and 1986. The data source for the study was the Life Office Management Association (LOMA) Information Processing database. LOMA is the insurance industry for life insurers. Harris and Katz (1991) examined both the year by year relationship between Information Technology investment and organisational performance. The results of the study indicated that the ratio of Information Technology expense was higher in the top performance life insurance firms in comparison to the weak performance life insurance firms.

Powell and Dent-Micallef (1997) examined Information Technology as a competitive advantage. This study focused on retail industry. Variables and dependent variables were used. The variables were human, business and technology. Two performance measures were used as dependent variables which were Information Technology performance and financial performance. The data was analysed using a linear regression model. The results helps to explain why some firms benefit form the use of Information technology and why some do not. After analysing the results, Powell and Dent-Micallef (1997) stated that "technology alone is not enough."

2.6.2 Productivity

Banker *et al.* (2002) describes a piece of research which investigated the impact of Information Technology on public accounting firm productivity. A large accounting firm was identified as its research site. Banker *et al.* (2002) had access to the firm's senior management therefore both quantitative and qualitative data could be easily obtained. The firm updated and transformed their Information Technology in 1998. Banker *et al.* (2002) were then able to make comparisons from the periods before and after 1998 to evaluate the impact of Information Technology on the firm's performance. Several

interviews along with 24 monthly observations were carried out in order to obtain the required data. The results of the study carried out by Banker *et al.* (2002) indicate that Information Technology has different impact on professionals at different levels. Furthermore, there had been a significant improvement in efficiency and revenue.

2.6.3 Firm Size

Ezzamel *et al.* (1997) carried out interviews in thirty-three UK companies in relation to the changes in management accounting; twenty-four of these companies came from the manufacturing industry. The main objective of the study was to investigate new developments in Information Technology which could have major consequences on the nature of accounting information and on the organisation of the accounting function. After analysing the interview material, it gave a greater insight concerning the role of accounting in modern organisations. The first insight relates link between accounting procedures and methods of calculation to the recent changes in Information Technology therefore facilitating in the managing of large databases which can be reviewed on a regular basis. Furthermore, the interview results indicated the reduction in the number of employees and the decline in the preparation and presentation of accounting reports.

Additionally, Brynjolfsson *et al.* (1994) examined the relationship between Information Technology and firm size. This study used all available data in US to directly examine the relationship between Information Technology and the average firm size. To measure the size of the firm, number of employees, total sales and total value were used. The data was analysed using a two stage least-squares regression estimate of the correlation between Information Technology and various measures of firm size, while also controlling for other explanatory variables. The overall results indicated that Information Technology contributes to a decline in a firm's size. However, it is also noted that Information Technology only impacts on a firm's size in

year two of its implementation therefore the impacts are not felt immediately. Brynjolfsson *et al.* (1994) stated that the “findings should not be interpreted to apply to all industries and at all time periods.”

2.6.4 Output and Quality

Mukhopadhyay *et al.* (1997) investigated the impact of Information technology on process output and quality. They measured the use of Information technology on the mail sorting application at the United States Postal Service (USPS). Process output and quality of output were the endogenous variables. They used data from forty six mail processing centers over 3 fiscal years. Labour hours and machine hours were used as the physical measures. Output quality was measured in terms of the timeliness of mail processing. The data collection began with observations of first hand activities. Quantitative data was then obtained from the United States Postal Service (UPSP) data bases. The results of these findings indicate that Information Technology has a positive impact on output and quality.

2.6.5 Justifying the need for Information Technology

Powell (1992) investigates the difficulty of evaluating investment in Information technology. There are numerous arguments that the cost and benefits of the use of computers are hard to identify. Powell (1992) conducted a research into the different views of evaluating investment in Information Technology. Powell (1992) concluded that “the rapid pace of change in IT technology poses serious starting problems for any large investment” but “this does not, however, negate the need to evaluate projects.” It is difficult to justify the need for Information Technology in a firm. However, there are techniques identifying the success and failure of Information Technology in a firm, which don’t appear to be widely used.

Furthermore, Mukhopadhyay *et al.* (1995) outlines the concern in relation to quantifying a business's value of Information Technology because of the large investment in Information Technology made by numerous firms. This study investigated the business value of Information Technology. To assess the impact of Electronic Data Interchange systems, cross-sectional and time series data were combined. The data focused on nine assembly plants over the period 1981 to 1990. The results of the study indicated that EDI has helped to improve inventory turnover and the benefits of this for the firms can be clearly established.

The design and objectives of these previous studies correlates with the current research. A number of studies use both qualitative and quantitative methods to collect their data including Banker *et al.* (2002); however there are other studies which use only one data collection method including Devaraj and Kohli (2003). For this research, the most appropriate method of data collection is to use both quantitative and qualitative data. The research questions and objectives of the research have been answered in the variety of literature which has been reviewed.

Table 2.1 Research question

Research Question	Literature
Does Information Technology help to improve performance within an accounting firm?	Devaraj and Kohli (2003) Harris and Katz (1991) Willcocks and Lester (1997) Bharadwaj <i>et al.</i> (1999) Powell and Dent-Micallef (1997)

Table 2.2 Sub-questions

Sub – Question	Literature
Does the use of Information Technology increase the productivity of the firm?	Banker <i>et al.</i> (2002)
Does the use of Information technology result in the reduction of the number of employees within a firm?	Ezzamel <i>et al.</i> (1997) Brynjolfsson <i>et al.</i> (1994)
Does the use of Information Technology result in the improvement of output and quality?	Mukhopadhyay <i>et al.</i> (1997)
Does the firm have difficulty in justifying the need for Information Technology?	Powell (1992) Mukhopadhyay <i>et al.</i> (1995)

2.7 Perceptions on the impact of Information Technology in accounting firms

There are a range of opinions both negative and positive on the value of Information Technology in accounting firms. These opinions are now explored under the following headings: opportunities and challenges.

2.7.1 Opportunities

It is believed that the examination of the impact of Information Technology in accounting firms productivity and performance will be of considerable interest to both academic inquiry and practice (Banker *et al.* 2002). Several studies suggest that the use of Information Technology helps to improve a firm's performance. Powell (1992) outlines four reasons for using Information

Technology as a strategic resource: to improve productivity and increase performance; to gain competitive advantage; to develop new business and enable new ways of managing and organising the business.

Accounting firms invest considerable amount of money in Information Technology with the hope of gaining significant returns which will impact on their performance. Devaraj and Kohli (2003) narrate that the increase in the use of Information Technology will result in the improvement of the financial and quality performance. Additionally, it can be argued that Information Technology that Information Technology supports accountants in relation to analytical and decision making decisions as when accounting information is processed manually; it may be inaccurate (Banker *et al.* 2002). When preparing accounts manually, accountants need to be careful when writing numbers down and using the calculator. However, when using computerized method it saves a lot of time as the numbers are generated automatically and cross-referenced. Ezzamel *et al.* (1997:447) state that Information Technology can be seen as "improving the accuracy and internal dissemination of information." Farrell *et al.* (2003) believe that new technology deployed effectively can enable businesses to increase productivity, improve performance and redefine competition within their sectors so it is essential for businesses to know where and when to invest. The adoption of Information Technology can generate new types of accounting information such as the introduction of ERS which can be used instead of invoicing and the performance of new accounting calculations. The use of Information Technology reduces the need for accounting firms to wait for days to receive information and data as everyone now expects immediate results (Garen 2007).

2.7.2 Challenges

Powell (1992) explains that here have been conflicting results from different readings as some articles argue that Information Technology improves a

firm's performance whilst other articles dispute that the performance is not always observable. In addition, the increased investments in Information Technology have led to the need to provide economic justification as it is estimated that spending in the Information Technology is expected to increase (Devaraj and Kohli 2003). There are also reports of mixed findings between the relationship of Information Technology investments and the firm's profitability (Bharadwaj *et al.* 1999). Furthermore, there are a lot of security threats from within the business relating to Information Technology such computer attacks and hacking which may occur as a result of lack of user end training and motivation within the workplace (Stone and Henry 2003).

Brynjolfsson *et al.* 1994 argue that investment in Information Technology may lead to a smaller firm size. Furthermore, managers in the UK see the scope of reducing accounting personnel as a result of the increasing use of Information Technology (Ezzamel *et al.* 1997). Moreover, employers who are seeking accounting and accounting technology professionals may aim for the near impossible in trying to find all the traits they seek in the same individual (Lamberton *et al.* 2005). Xiao *et al.* (1997) report that Information Technology related changes can be observed in a number of ways including questioning directly what changes have been caused by Information Technology, analysing the importance of Information Technology use in changes that have occurred and by examining the relationship between the changes identified and Information Technology. Many businesses worry about the increased costs of Information Technology and wonder if it is worth it. Within the banking sector, one can observe that the use of Information Technology is worth it and helps to improve performance. The banking sector offers a lot of services that are related to Information Technology for example the online banking which enables customers to manage their accounts, apply for loans, set up deposits and payments and so on (Morrison and Graves 2004).

There are suggestions that there is computer anxiety among employees within a firm particularly in relation to females. Furthermore, there is an increase in ambiguity in relation to the increased dependence and reliance on Information Technology (Feeny and Willcocks 1998). This may result in the widening of the gaps between the requirements of the job to be performed and the interests of the accountants. The use of Information Technology can affect the risk assessment, control environment, information communication, monitoring and control activities (Gelinias and Gogan 2006).

The perceptions reported in the literature of the impact of Information Technology in accounting firms have assisted in the answering of the research questions and objectives of the research which is in relation to the performance, productivity, cost and the firm size of accounting firms.

2.8 Conclusion

In summary, this is a small scale study based on the evaluation on the impact of Information Technology in accounting firms. The analysis of the literature assisted in the answering of the research questions and objectives. The main findings of the literature is that the use of Information Technology in accounting firms improves performance, increases the productivity, results in a smaller firm size, improves output and quality and leads to the difficulty in justifying the need for Information Technology. The analysis of the literature influenced this research when making the decision in which data collection methods would be most suitable for the research. It is proposed that qualitative and quantitative data will be used for the research.

It is envisaged that the results of this research would provide valuable feedback to present and future accounting firms. Although this research is applicable to accounting firms in Letterkenny, it may also add to the collective knowledge on the impact of Information Technology in accounting firms in Ireland. It is predicted that the results should enable accounting

firms to make a decision on whether to increase or decrease investments in Information Technology. Additionally, the results of the research should benefit the education sector both at secondary level and third level as it should give an indication whether or not they should focus more on Information Technology in relation to accounting.

Chapter 3 – Research Methodology

3.1 Introduction

This chapter reviews the methodology adopted for the research which will include a description of the research problem, the research process and the data collection methods used. Saunders *et al.* (2003:3) define research “as something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge.” There is a difference between research methods and research methodology. A research method is the various procedures used in research while research methodology is a systematic way to solve a problem or the way research is to be carried out (Rajasekar *et al.* 2006). Robson (2002) argues that a well designed piece of research is not just of value to those concerned with carrying out the research, it is also of interest to one or more academic disciplines. The first procedure an individual needs to undertake when conducting the research is to identify an area of interest. The impact of Information Technology in accounting firms is of considerable interest to present and future accounting firms, the education sector and to the researcher.

3.2 Research Process

The first step in the research process was to research and review various literature which consisted of articles, journals and books. Firstly, secondary data was explored and reviewed. Secondly, primary research was then carried out which consisted of questionnaires and interviews. The process in relation to the questionnaires and interviews is discussed in this chapter.

3.2.1 Research Problem

The aim of this research was to investigate the impact of Information Technology in accounting firms. There have been similar studies carried out previously in relation to this topic such as the one carried out by Banker *et al.* (2002). However, there haven't been many studies carried out within the Irish context.

3.2.2 Research questions and aims

The primary aim of this research was to understand the impact of Information Technology in accounting firms. The resulting research question is as follows: Does Information Technology help to improve performance within an accounting firm? This research question can be broken down into the following sub-questions:

Table 3.1 Sub-questions

Does the use of Information Technology increase the productivity of the firm?
Does the use of Information Technology result in the reduction of the number of employees within a firm?
Does the firm believe that the introduction of Information Technology is too expensive?
Does the use of Information Technology improve accuracy?
Does the use of Information Technology reduce the time needed to prepare accounts?
Does the firm have difficulty in justifying the need for Information Technology?
Does the use of Information Technology result in the improvement of output and quality?

3.2.3 Research Philosophy

Saunders *et al.* (2003:83) express that research philosophy “depends on the way that you think about the development of knowledge.” There are three perspectives about the research process which are positivism, realism and interpretivism which are different views about the way in which knowledge is reviewed and developed as being appropriate (Saunders *et al.* 2003). These views are known as paradigms. Ritzer (1975:156) refers to a paradigm as encompassing “the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community.” A paradigm is critical to the success of the research and can influence the way the research is undertaken. Prior to the research process, the researcher analysed the paradigms therefore ensuring that the aims and objectives of the research were met. The paradigms are explored under the following headings positivism and interpretivism.

3.2.3.1 Positivism

The approach to positivism involves adopting a “philosophical stance of the natural scientist” (Saunders *et al.* 2003: 83). This study of a physical phenomenon came from the natural sciences. Furthermore, positivism can be a theory of law which “aims to explain certain familiar features of societies in which law exists, and it proposes to do so by analysing the ‘concept’ of law” (Leiter 1999:1140). Saunders *et al.* (2003) reflect that the researcher is an objective analyst. The positivism view tends to be large scale and mainly focuses on the quantitative approach. However, qualitative methods may be used occasionally. Robson (2002:27) interprets that “positivists maintain that one reality exists and that it is the researcher’s job to discover what it is.” There are numerous criticisms in relation to the positivism approach with one author stating that “positivism is dead” (Robson 2002). The positivism approach can be seen as very “narrow and sterile in face of the complex normative structure of the contemporary legal systems” (Pino 1999:513).

The following are strengths of the positivist approach:

Table 3.2 Strengths of the positivist approach

Positivist research is economically in relation to time, place, environment and sample size
Positivist research gives clear objectives and theoretical focus
Positivist research enables data to be easily obtainable and easily compared with other data
Positivist research enables the researcher to have a greater opportunity to retain control of the research process

The following are weaknesses of the positivist approach:

Table 3.3 Weaknesses of the positivist approach

Positivist research is unrealistic in terms of searching for ideal and perfect standards
Positivist research may show lack of consideration and acknowledgement for the subject and may be inflexible
Positivist research may demonstrate an inability to accurately prove hypotheses through empirical experiments and therefore is very vague
Positivist research assumes that social reality can be discovered in each society independently

3.2.3.2 Interpretivism

Walsham (1995) state that the interpretivists approach assumes the situation that our awareness of reality is a social construction of human actors. In this view, the researcher has the responsibility of interacting with human objects of the enquiry therefore changing the perception of both parties. Interpretivist approach recognises that there are multiple realities and these may differ because of circumstances that may arise in relation to the time and place. Carson (2005) clarify that the interpretivist approach allows the focus to be on what is occurring in a given context and furthermore, it considers the most important characteristics of research that is in contrast with the positivist approach. Saunders *et al.* (2003:84) note that in relation to the interpretivist position, "it is necessary to explore the subjective meanings motivating people's actions in order to be able to understand these."

Carson (2005:63) states that "interpretivism methodologies seek to 'build' theory as a result of empirical insights so the theory building phase of a research project is given explicit and careful attention." This approach assumes that the world is changing rapidly and the researcher is an integral part of this. Interpretivism is critical of the positivism as it seeks to analyse and collect data from parts of a phenomenon, whereas by using the positivist approach the researcher may miss some of the important aspects.

The following are strengths of the interpretivist approach:

Table 3.4 Strengths of the interpretivist approach

Interpretivist approach assists in the understanding social process
Interpretivist approach facilitates the understanding and making sense of phenomena by using a more personal approach
Interpretivist approach enables the researchers to respond to changes that occur in the research process

The following are weaknesses of the interpretivist approach:

Table 3.5 Weaknesses of the interpretivist approach

Interpretivist approach may be perceived as less realistic by 'non-researchers'
Researchers must expect to face some uncertainties in the research process such as bias
Data collection can be time consuming
Difficulty may occur when analysing data

To conclude, both of these research paradigms are in contrast each other. The positivist approach tends to produce quantitative data; using large samples; with specific and precise data; with high reliability and low validity.

In contrast the interpretivist approach tends to produce qualitative data; using small samples; with rich and subjective data; with low reliability and high validity. It can be noted that no single research methodology is beneficial than any other methodology and the majority of researchers prefer a combination of both therefore leading to an improved quality of the research.

3.2.3.3 Research philosophy adopted

When deciding which appropriate method of philosophy to adopt, it is necessary for the researcher to analyse the aims and objectives of the research and then choose the most appropriate method. In this case, the researcher uses both philosophies; the positivist and interpretivist approach. By adopting both philosophies, it was time consuming for the researcher. However, it assisted in the reduction of inappropriate uncertainty and it helped to “address different but complementary questions within a study” (Robson 2002:371). Banker *et al.* (2002) has used both qualitative and quantitative data to acquire their data which enabled them to support their argument which is consistent with this present objective. Qualitative research is research that allows for in depth understanding of the process and allows generalizations of results from the population as a whole, while quantitative data relates to the statistical analysis of large data sets (Brennan 1998). The data collection methods consisted of desk research, questionnaire and interviews which meant both philosophies were used.

The positivism approach was adopted by the researcher via the use of questionnaires which were distributed to various staff members within the accounting firms in Letterkenny. The questionnaires were accompanied with a cover letter which was emailed to the accounting firms. This positivist approach was easy to analyse and assisted the researcher when drawing conclusions as they help to demonstrate the emerging trends and changes. Additionally, questionnaires allow the researcher to collect data in a quick

and efficient manner so are therefore less time consuming than interviews and a large sample can be surveyed. However, questionnaires have a few limitations such as misunderstandings of the question may occur, there may be a low response rate, the respondents may not treat the questionnaire seriously or not answer it honestly.

The interpretivist approach was adopted by the researcher, conducting in-depth interviews with the partners of accounting firms in Letterkenny. This interpretivist approach was flexible and facilitated in the understanding of phenomena by taking a more personal approach. This approach allowed the researcher to obtain different opinions and answers on the research topic, enabling the researcher to design a more effective data analysis. However, the use of this approach has limitations and the main one occurring is bias. When conducting the interview, the researcher taped, transcribed and removed no essential material to assist the analysis.

3.2.4 Research approach

When deciding which research approach to undertake, the researcher had to investigate and understand the various approaches which they could adopt. The researcher could choose between two approaches which were the inductive approach and the deductive approach. Saunders *et al.* (2003:85) defined a deductive approach as when "you develop a theory and hypothesis (or hypotheses) and design a research strategy to test the hypothesis." Furthermore, Saunders *et al.* (2003:85) defined an inductive approach as when "you would collect the data and develop a theory as a result of your data analysis."

The research approach adopted by the researcher was the inductive approach. The inductive approach is appropriate for this research as the researcher is investigating the impact of Information Technology in accounting firms. The theory will be formulated as a result of the analysis

(Saunders *et al.* 2003). This approach may assist in discovery of new impacts of Information Technology in accounting firms from the data collected via interviews and questionnaires. Saunders *et al.* (2003) outline the reasons why an approach to the research project is important. Firstly, an informed decision can be made about the research design. Secondly, it will assist the researcher in adopting the most suitable approach for the research. Thirdly, it will enable the researcher to adapt the research design to cater for any limitations or constraints.

3.2.5 Research focus

There are three different types of research focus a researcher can adopt which are exploratory research, descriptive research and explanatory research.

3.2.5.1 Exploratory research

Robson (2002:52) illustrates exploratory research as “to find out what is happening, particularly in little-understood situations; to seek new insights; to ask new questions; to assess phenomena in a new light; to generate ideas and hypotheses for future research and almost exclusively of flexible design.” This approach can be used when a researcher wishes to clarify a problem. Saunders *et al.* (2003) states that there are three ways for a researcher to conduct exploratory research which includes talking to experts about the subject, conducting focus group interviews and researching the literature available.

3.2.5.2 Descriptive research

Robson (2002:52) articulates descriptive research as “to portray an accurate profile of persons, events or situations.” This approach may be flexible and requires the researcher to have previous knowledge of the situation to enable

them to gather the necessary information (Saunders *et al.* 2003). When using this approach the researcher should have a clear strategy in place when deciding how data will be collected and this approach can be used to assist in decision making and provide basis for further research.

3.2.5.3 Explanatory research

Robson (2002:52) outlines explanatory research as seeking “an explanation of a fixed situation or problem, traditionally but not necessarily in the form of casual relationships.” When the researcher adopts this approach, they are required to assess the situation and explain the relationship between variables (Saunders *et al.* 2003).

3.2.5.4 Research focus adopted

For this research project, the researcher has undertaken two of the concepts outlined above which are descriptive research and exploratory research. The descriptive research approach was adopted by the researcher via an analysis of the variety of literature available which consisted of journals, articles and books. The descriptive research approach influenced the range of interview questions and number of interviews to be carried out. The aim of these interviews was to achieve wide coverage across the key issues and to obtain an unbiased accurate account of the respondents’ perspective on the research topic. The exploratory research approach was adopted by the researcher via questionnaires and interviews. The interviews and questionnaires addressed the issues which have arisen in recent years such as the rapid progressions in Information Technology, the challenges accountants face and the variety views on the investments in Information Technology.

3.3 Data collection methods

When deciding which data collection method to adopt, it is important for the researcher to analyse the research objectives and choose the most appropriate method. There are several methods available to the researcher for collecting data which are questionnaires/surveys, interviews, case studies and focus groups. For this research, the researcher has chosen to adopt a qualitative and quantitative approach via questionnaires and interviews as these methods are suitable to the research objectives. The qualitative and quantitative data methods which are to be used for this research should give sufficient insight into how Information Technology and accounting firms are linked. The data collection method addresses how Information Technology affects the role of an accountant and why accounting has to change with the developments in Information Technology. The researcher decided to collect both qualitative and quantitative data concurrently therefore neither method had priority which is known as the concurrent nested theory (Creswell 2003). The researcher chose to adopt this method of collecting data as it results in substantiated and well-validated findings. Furthermore, it results in a short data collection time period and allows the researcher to gain a broader perspective as a result of using both the qualitative and quantitative method. Creswell (2003) noted that qualitative data could be used to access information which cannot be obtained when using quantitative data. The researcher chose five accounting firms in Letterkenny as its sample size as the researcher based its research process on a similar study carried out by Banker *et al.* (2002) and additionally, this similar study also used both qualitative and quantitative data collection methods. Furthermore, qualitative and quantitative data was easily obtained within the small sample size as it was convenient.

3.3.1 Interviews

Saunders *et al.* (2003:246) defines an interview as “may be highly formalized and structured, using standardized questions for each respondent, or they may be informal and unstructured conversations.” There are three types of interviews which are structured, semi structured and unstructured. Robson (2002:270) defined a structured interview as having “predetermined questions with a fixed wording, usually in a pre-set order.” Robson (2002:270) illustrates a semi-structured interview as having “predetermined questions, but the order can be modified based upon the interviewer’s perception of what seems most appropriate.” Robson (2002:270) interprets an unstructured interview as having “a general area of interest and concern, but lets the conversation develop within this area.”

The researcher chose an interview as a method for collecting data as it is flexible and a constructive manner for obtaining information (Robson 2002). However, interviews can be time consuming and may have an element of bias attached to it therefore careful preparation was needed. For this research, the researcher chose to use the semi-structured interview as it gave the researcher the opportunity during the interview to omit any questions which were inappropriate. The semi-structured interviews were conducted with the one partner in five different accounting firms in Letterkenny. The researcher decided to use sample size of five different accounting firms in Letterkenny as the research process was based on a similar study carried out by Banker *et al.* (2002:210) who “obtained both qualitative and quantitative data from five offices of the firm.” The duration of each interview was thirty minutes. Each interview was tape recorded which allowed the interviewer to focus both on the line of questioning and the responses received from the interviewee. Before the researcher conducted the interviews, a letter was given to the interviewee’s which a copy of can be found in Appendix I.

3.3.2 Questionnaires

Saunders *et al.* (2003:280) defines questionnaires "as a general term to include all techniques of data collection in which each person is asked to respond to the same set of questions in a predetermined order." It is important for the researcher to design a questionnaire appropriately as problems may arise due to a poor questionnaire design such as respondents failing to understand the questions and the questions being interpreted in ways researcher did not intend (Kent 2001). The researcher needs to consider a number of issues when designing the questionnaire such as the types of questions, the respondents and the method of distribution.

The questionnaire was used as a method for collecting data as there were no time constraints, no cost issues and it was easy to process the data. The researcher designed the questionnaire after analysing the objectives of the research and the literature available. For this research, the researcher distributed the questionnaire to each member of staff in the five selected accounting firms in Letterkenny. This questionnaire was distributed before the interview with a partner in each of the accounting firms. After the interview, the questionnaires were collected from each member of staff within the accounting firm. The questionnaire consisted of yes/no questions and likert-style rating questions. These types of questions were useful as it gave the researcher the opportunity to find out attitudes and opinions of the respondents, while also finding out whether they agree or disagree with a statement. A copy of the questionnaire can be found in Appendix II.

3.4 Data analysis

The data was analysed using a bar chart. Robson (2002:403) defines a bar chart as "a type of histogram where the bars are separated from each other rather than being joined together." This method of analysing data was

chosen as it is quick, flexible and is easily understood. Furthermore, the bar chart provides a clear and accurate representation of the data collected.

3.5 Ethical considerations

There were many ethical issues that the researcher needed to consider. In relation to the interviews, permission was needed to be obtained from the interviewee's for the interview to be carried out and taped which was done via the letter and verbally. Furthermore, the researcher needed to assure the interviewee that the interview will be confidential and anonymous. In relation to the questionnaire, it was imperative that anonymity and privacy of the respondents were safe-guarded. In addition, the data needed to be collected fully and accurately without omitting any important information.

3.6 Conclusion

The objective of the research was to investigate the impact of Information technology in accounting firms. The researcher completed this investigation by adopting a philosophy, research focus and a research process. The researcher used two philosophies which were positivist and interpretivist. Furthermore, the researcher used two focus methods which were exploratory and descriptive. To conclude, the research process consisted of conducting semi-structured interviews and circulation of questionnaires.

Chapter 4 – Data findings

4.1 Introduction

In this chapter, the researcher will examine the data collected from the research process. In addition, the researcher will analyse the objectives with the data collected. The researcher will commence by discussing the results of the questionnaire. Moreover, the researcher will discuss the findings of the interview. For the research process, qualitative and quantitative data methods were used to obtain data via questionnaires and interviews. The purpose of the research was to acquire the opinions from the partners of the accounting firms via interviews and additionally, acquire the opinions of staff via questionnaires on the impact of Information Technology in accounting firms. Letterkenny accounting firms were chosen as the target audience for convenience purposes and the sample size of five accounting firms were chosen as the researcher based the research on a similar research carried out by Banker *et al.* (2002). Furthermore, the researcher used both qualitative and quantitative data which was also previously used by Banker *et al.* (2002). Before the commencement of the interview with a partner of each accounting firm, a questionnaire was circulated to all the employees of the five accounting firms and the questionnaire was collected after the interview.

The researcher was fortunate that the response rate for the questionnaire was high. This may be due to the questionnaire being circulated and collected by the researcher on the day of the interview.

Table 4.1 Summary of the questionnaire responses

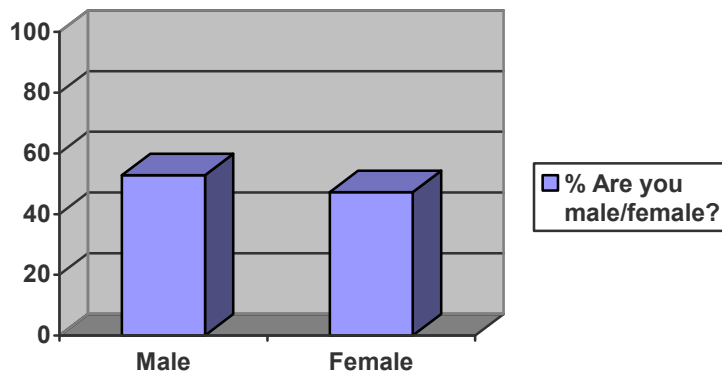
Details	Number
Total population	58
Total responses	53
Response rate	91%

4.2 Questionnaire results

4.2.1 Demographic details

For this research, the researcher distributed a questionnaire to the staff members in the five selected accounting firms in Letterkenny. The number of questionnaires that were circulated to staff members was 53. The researcher had difficulty as not all staff members were present in the accounting firms. The number of staff members that were not present in the five accounting firms was 5. Of the 53 staff members who responded; 28 were male (52.8%) and 25 were female (47.2%).

Figure 4.1 Percentage analyses of the respondents using a bar chart



In relation to the age group category in the questionnaire, 25 staff members were in the age group category 18-35, 18 staff members were in the age group category 36-49 and 10 staff members were in the age group category 50+.

4.2.2 Education details

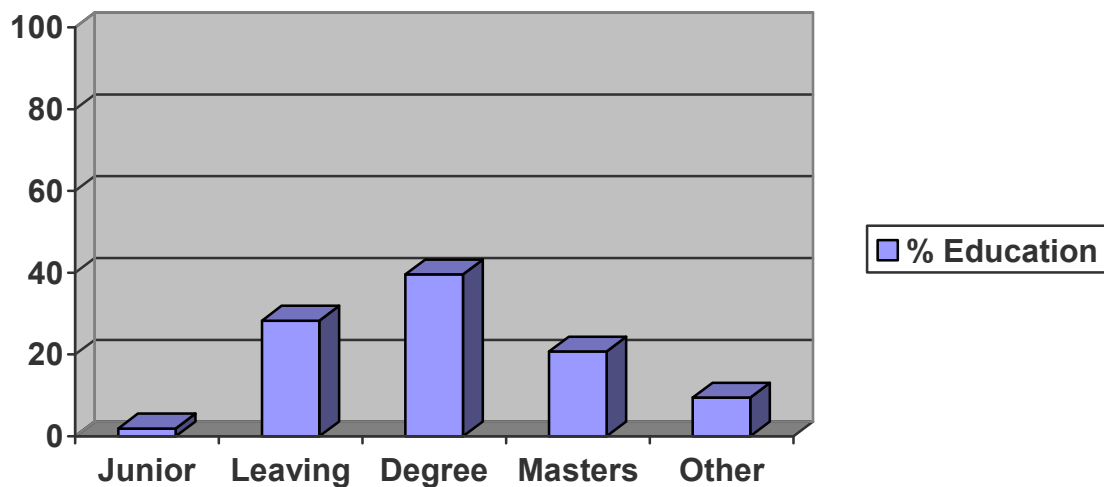
Following the personal details section of the questionnaire, each respondent was asked to state their highest education qualification. This was important for the researcher to determine if the respondents had been exposed to Information Technology during their second and third level education. The respondents had to choose between the following education sectors:

Table 4.2 Education sectors

1	Junior certificate
2	Leaving certificate
3	Degree
4	Masters
5	Other

The results of this indicated that 1.9% of the respondents had junior certificate qualification; 28.3% of the respondents had leaving certificate qualification; 39.62% of the respondents have a degree qualification; 20.75% of the respondents have a master's qualification and 9.43% have an other qualification which consisted of Chartered Accountant and ACCA qualification.

Figure 4.2 Summary of the respondent's education qualification



In addition, the respondents who had the third level qualification were asked if they had previously been presented with Information Technology applications which apply to firms such as Revenue Online System (ROS) and Sage.

Of the 32 respondents which this question applied to, 43.75% of the respondents stated yes and 56.25% of the respondents stated no. This indicated that the majority of the staff members in the accounting firm are unfamiliar with the applications and will need training in relation to the utilization of them.

4.2.3 Accounting profession

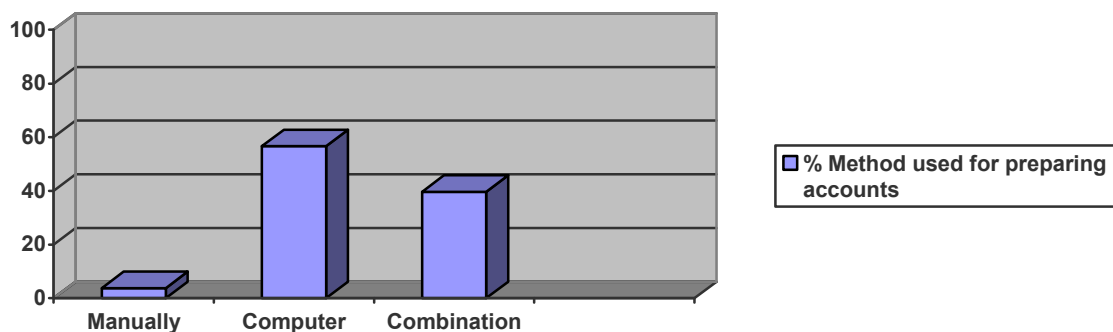
Following the education section of the questionnaire, the respondents were then asked about their views on the accounting profession. The first question asked the respondents which method they preferred using when preparing accounts. The respondents had to choose between three answers:

Table 4.3 Method used for preparing accounts

1	Producing accounts manually
2	Producing accounts using a computer
3	Combination of both

3.78% of the respondents stated that they would prefer producing accounts manually, 56.6% of the respondents stated that they would prefer to produce accounts using a computer and 39.62% of the respondents stated that they would prefer to use a combination of both.

Figure 4.3 Summary of the methods used to prepare accounts



Of the 3.78% respondents who preferred to prepare accounts manually, 50% of them were aged between 36-49 and 50% were aged 50+. Of the 56.60% respondents who preferred to prepare accounts using a computer, 60% of them were aged between 18-35, 33.33% were aged between 36-49 and

6.66% of them were aged 50+. Of the 39.62% respondents who preferred to produce accounts using a combination of both methods, 33.33% were aged between 18-35, 33.33% were aged between 36-49% and 33.33% were aged 50+.

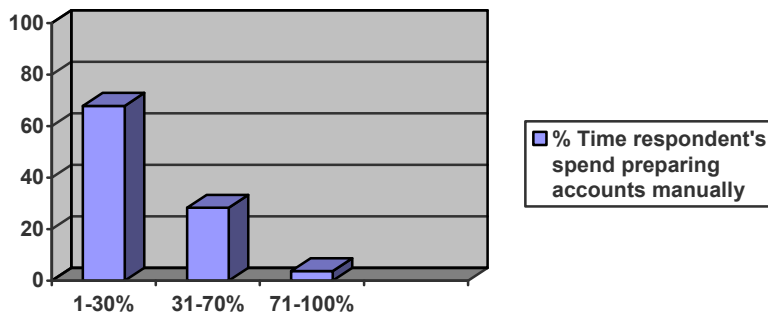
The second question on the accounting profession section asked the respondents in relation to the percentage of time they spend preparing accounts manually. The respondents had to choose between the three answers:

Table 4.4 Time you spend preparing accounts manually

1	1-30%
2	31-70%
3	71-100%

The results show that the majority of the respondents 67.92% spend between 1-30% of their time preparing accounts by completing them manually. However, 28.30% of the respondents spend between 31-70% of their time preparing accounts by completing them manually and 3.78% of respondents spend between 71-100% of their time preparing accounts manually. It is interesting to note that no respondent aged between 18-35 spend more than 70% of their time preparing accounts manually.

Figure 4.4 Summary of the time respondents spend producing accounts manually



The third question on the accounting profession section asked the respondents about the amount of time they spend preparing accounts using Information Technology. The respondents had to choose between the three answers:

Table 4.5 Time you spend preparing accounts using Information Technology

1	1-30%
2	31-70%
3	71-100%

The results show that the majority of the respondents 62.26% spend between 1-30% of their time preparing accounts using Information Technology. Additionally, 33.96% of the respondents spend between 31-70% of their time preparing accounts using Information Technology and 3.78% of the respondents spend between 71-100% of their time preparing accounts manually. The researcher has noted that the 50% of the respondents who spend between 71-100% of their time preparing accounts are aged between 18-35.

The fourth question in the accounting profession section asked the respondents to rate the importance of four factors in relation to Information Technology. These possible responses to these factors were as follows: strongly agree, agree, no preference, disagree and strongly disagree. The researcher assigned each response a rating in order to determine which factor was rated the highest. A response of strongly agree was allocated a rating of five. A response of no preference was allocated a rating of three. In addition a response rate of strongly disagree was allocated a rating of one. The respondent's were asked to rate the following factors:

Table 4.6 Factors in relation to Information Technology

1	Information Technology improves accuracy
2	Information Technology reduces the time needed to prepare accounts
3	Difficulty may arise when using Information Technology
4	Security issues may arise when using Information Technology

Table 4.7 Breakdown of responses regarding the factors in relation to Information Technology

Factors	Strongly disagree	Disagree	No preference	Agree	Strongly agree
Information Technology improves accuracy	1		1	12	39
Information Technology reduces time needed to prepare accounts				10	43
<i>Difficulty may arise when using Information Technology</i>	9	10	13	12	9
<i>Security issues may arise when using Information Technology</i>	2	5	12	26	8

The results of question four indicate that the majority of the respondents agree 22.64% and strongly agree 73.58% that Information Technology improves accuracy. Additionally all of the respondent's agree that the use of Information Technology reduces the time needed to prepare accounts. It is apparent that there are different opinions in relation to difficulties in utilizing Information Technology. However, the majority of the respondents 39.62% state that they agree about difficulty arising when using Information Technology. Similarly, there are various opinions given by the respondent's in relation to the security issues which may arise when using Information Technology and 22.64% stating that they have no preference.

The fifth question in the accounting profession section asked the respondents to answer 'yes' or 'no' to questions in relation to Information Technology. The respondents had to answer the following questions:

Table 4.8 Questions in relation to Information Technology

1	Did you need training before using Information Technology based applications? e.g. Sage, Microsoft Excel and ROS
2	Have you experienced any difficulty when using Information Technology?
3	Do you find Information Technology applications complicated?
4	Do you think there are security issues in relation to Information Technology? e.g. hacking
5	Do you believe that computer anxiety arises at you workplace?

The results show that 73.58% of the respondents needed training before the use of Information Technology based applications. The remainder of the respondents who did not require training, 22.65% were aged between 18-35 and 3.77% were aged between 36-49 which indicated they had been exposed to the applications before when studying at third level. Additionally,

the results indicate that 26.42% of the respondents encounter difficulty using Information Technology and 73.58% encounter no difficulty. 50% of the respondents who had difficulty were aged 50+ which may be as a result of the respondents not being exposed to Information Technology at leaving certificate level or third level. Furthermore, the results indicate that the majority of respondents 79.25% do not find Information Technology applications complicated. However, there is a concern from the respondents in relation to the security issues with 84.91% of respondents stating that they believe there are security issues in relation to Information Technology. The last question indicates that over a quarter 26.42% of the respondents experience computer anxiety at the workplace and 50% of these respondents who experienced computer anxiety were aged 50+.

The final question in the accounting profession section required the staff members to state which accounting task they preferred to complete manually and which accounting task they preferred to complete using Information Technology. The respondents were required to answer each task by choosing between manual or Information Technology. The six tasks are calculation of figures; preparation of bank reconciliation statements; communication with clients; preparing VAT returns; submitting revenue returns and which method would the respondent prefer to use on a day-to-day basis.

Table 4.9 Accounting tasks respondents are required to complete

Accounting tasks	Manually	Information Technology
Calculation of figures	20	33
Preparation of bank reconciliation statements	7	46
Communication with clients	31	22
Preparing VAT returns	1	52
Submitting revenue returns	2	51
Which method do you prefer to use when preparing accounts?	1	52

4.3 Interview results

For this research, the researcher carried out five interviews with a partner from each of the accounting firms in Letterkenny. The researcher used semi-structured interview as it gave the researcher the opportunity during the interview to omit any questions which were inappropriate. The duration of each interview was thirty minutes. The interview was divided into three sections. The first section related to Information Technology and the accounting firm. The second section related to the applications for the accounts. The third section related to the implications of using Information Technology.

4.3.1 Information Technology and the accounting firm

After the five interviews, the researcher found that 100% of interviewees had been a partner within the accounting firms from between 3 years and 11 years. 80% of the partners had previously worked in other accounting firms before and 20% of the partners did not work in another accounting firm. All of the partners had been familiar with the use of Information Technology when they trained to be an accountant. However, the partners stated that they find a huge difference between Information Technology applications in the past in the accounting firms and the Information Technology applications in accounting firms at the present time. The partners stated that they believe that the use of Information Technology helps to improve accuracy when preparing accounts and reduces errors occurring.

Furthermore, 100% of the partners reflected that they believe the use of Information Technology reduces the time needed to prepare accounts. The partners conveyed that when they trained to be accountants, the majority of accounting tasks such as writing up cheque journals and ledgers were done manually which was very time consuming and errors occurred frequently. In addition revenue returns were submitted manually. However one of the partners stated that submitting revenue returns online will become compulsory in the future as each accounting firm had been notified about this upcoming change recently. In the 1990s the computers were very expensive for the firms to buy as they cost round fifteen-twenty thousand pounds. However, at present the cost had been reduced significantly and firms are now able to afford to purchase them.

4.3.2 Applications for accounts

Firstly, the researcher asked the partners about their views on Information Technology applications such as SAGE and Revenue Online System (ROS). 100% of the partners stated that their accounting firms use both of these applications. The partners believe that the use of Information Technology applications saves time preparing accounts, saves time writing letters to clients and saves time typing. Furthermore the applications is very convenient and saves the cost of posting letters for example submitting revenue returns is now done online and does not need to be posted. One of the partners stated that "everything is at your finger tips rather than having to go downstairs and get information from employees." Sage assists in the production of the accounts and the completion of accounts. Microsoft Excel is used for producing spread sheets and completing bank reconciliation statements. Previously submitting revenue returns required a lot of time and labour. It was prepared manually and received and inputted on the other side. There was a lot of work involved with this method of submitting revenue returns and a lot of communication with the tax office was required especially when errors were made such as a box being ticked incorrectly. 40% of the partners hope to automate and upgrade the systems within the practice as soon as possible and 60% of the partners stated that their practice has been upgraded significantly and has become more automated within the last two years.

Secondly, the researcher then asked the partners where they exposed to the Information Technology applications when studying to become an accountant. 40% of the partners had not been exposed to any of the applications when they studied to become an accountant and found it difficult to adapt to the rapid changes in Information Technology and the applications available to them as there was very limited opportunities to study to Information Technology. 60% of the partners stated that they had to complete a small computer course when they trained to become an

accountant and the partners were constantly required to use a computer to prepare accounts. However, these partners were not exposed to all of the Information Technology applications.

Thirdly, the researcher then asked the partners if they had experienced any difficulty when using the Information Technology applications such as security issues or break-downs. The partners reflected that at the beginning before accounting firms became more automated, floppy disks were used to save data which resulted in data becoming lost easily as there was no other method for saving a lot of different copies. Previously, security was not an issue as there was no internet or network and there was no need to communicate to clients outside the office. However, since the introduction of the internet, security has become a big issue within accounting firms. The partners affirmed that they have the necessary structures in place to deal with security issues and make sure that all information is stored and backed up. In addition, the majority of the partners stated that the only security issue that has occurred within the accounting firm is when the revenue updates their program which may cause a temporary fault in the system.

Similarly, the researcher asked the partners if they believed that the introduction of Information Technology applications resulted in the reduction of the number of employees within the firm or did it result in reducing the employees working hours. 40% of the partners stated that the use of Information Technology applications has no impact on employees as the client base of the company has increased since the company became more automated. In contrast, 60% of the partners stated that the introduction of the Information Technology applications has resulted in the reduction of the number of employees within the accounting firm. The partners cited that the accuracy of work and the amount of time required to prepare accounts is halved. Previously when using Revenue Online System (ROS), three people were required to type revenue returns which usually lasted up to three weeks to complete. However, there is no need for this work at present as Revenue

Online System (ROS) has progressed rapidly. In addition the revenue returns are filed electronically therefore employees only need to make amendments to them every year. The partners reflected that the accounting firms are moving towards a system of saving everything therefore resulting in nothing being repeated.

Moreover, the partners were asked about the employees within the accounting firms whether they have experienced difficulty in using Information Technology applications or if they have difficulty in adapting to the rapid changes in Information Technology. 100% of the partners indicated that the majority of the employees had previous experience of using Information Technology when they were in third level and at school. However, the partners stated that a lot of the employees were not exposed to all of the applications that are used by the accounting firms therefore the employees need training in relation to the new applications. In addition, the partners expressed that the younger employees do not have the same level of difficulty using the applications in comparison to the older and long term employees. Yet when the long term employees receive the required training, they see the benefit and improved efficiency therefore fewer problems occur.

4.3.3 Implications of using Information Technology

Firstly, in this section of the interview, the partners were asked if they felt that the use of Information Technology and its applications were very expensive. 80% of the partners felt that the initial costs, employee costs and training costs proved to be very expensive for the firms. In addition, they indicated that there is lack of competition as there is only one supplier of the Information Technology applications therefore they have a dominant position in the market place. However, the quality of information that arises from these systems and the benefits, pay for it and is worth the money.

Secondly, the partners were asked if the use of Information Technology helps to increase productivity and improve performance within the firm. 100% of the partners expressed that they have seen a significant increase in the number of accounts produced. In addition, the partners stated that their client base has increased considerably as the accounting firms have become more automated. 80% of the partners stated that the introduction of Information Technology helps in understanding the employees writing and figures are clearer therefore improving accuracy. Furthermore, partners are able to monitor their employees work on a daily basis. 100% of the partners implied that they want the accounting firms to move towards to becoming more Information Technology based. Additionally, the partners concluded that after receiving the required training, everyone including management and employees have become more comfortable using Information Technology and would never turn back to the old system of preparing accounts manually.

Chapter 5 – Data analysis

5.1 Introduction

This chapter will examine the results of the data from the research process and analyse the results by comparing the results with the research objectives. As previously stated in the introduction chapter the primary aim of this research is to understand the impact of Information Technology in accounting firms. The objective of the research is to detect the impact of Information Technology in accounting firms and to measure its impact on a firm's performance and productivity. The research question is as follows does Information Technology help to improve performance within an accounting firm? This research question was broken down into the following sub-questions:

Table 5.1 Sub-questions

1	Does the use of Information Technology increase the productivity of the firm?
2	Does the use of Information Technology result in the reduction of the number of employees within a firm?
3	Does the firm believe that the introduction of Information Technology is very expensive?
4	Does the use of Information Technology improve accuracy?
5	Does the use of Information Technology reduce the time needed to prepare accounts?
6	Does the firm have difficulty in justifying the need for Information Technology?
7	Does the use of Information Technology result in the improvement of output and quality?

As previously stated in the research methodology chapter, the researcher used both qualitative and quantitative methods to obtain data via questionnaires and interviews. Both of these methods were used concurrently and enabled the researcher to gain perspectives from the different types of data collected.

5.2 Information Technology and the performance of the firm

In the discourse of research, the researcher investigated if the use of Information Technology helps to increase the performance of the firm. Similar studies carried out by Devaraj and Kohli (2003) who explored the relationship between organisational performance and investment in Information Technology; Bharadwaj *et al.* (1999) who investigated the impact of Information Technology on a firm's performance and Willcocks and Lester (1997) who examined the relationship between Information Technology performance and its evaluation suggest that the use of Information Technology helps to improve performance within a firm. The results of the research were consistent with the literature that the researcher examined. The partners of the firms believed that the use of Information Technology resulted in an increase and improved performance within the firm. They stated clearly that their client base has increased considerably as a result of their accounting firms becoming more automated and the work carried out by employees can be monitored via the use of Information Technology and its applications. The partners stated that the employees are aware of this and aim to produce accounts accurately, effectively and on time therefore improving performance. However, the employees expressed concern in the questionnaire about the complications and difficulty in using the Information Technology applications with 73.58% of the employees needing training before using the applications, 26.42% of the employees experiencing difficulty using the applications and 20.75% of the employees found Information Technology applications complicated. Yet when analysing these results, the majority of the employees who experience problems in relation to Information Technology applications are aged 50+ and had not

been previously exposed to these applications during their second and third level education. Yet, 56.6% of the employees stated that they would prefer to produce accounts using Information Technology despite the difficulties that may be associated with it.

5.3 Information Technology and the productivity of the firm

The first sub-question of the research was to investigate if the use of Information Technology increases the productivity of the firm. Prior research such as the study carried out by Banker *et al.* (2002) suggests that the use of Information Technology increases the productivity within a firm. The study carried out by Banker *et al.* (2002) used both qualitative data and quantitative data to obtain all the relevant information which is appropriate for this research. The results are consistent with Banker *et al.* (2002) as 100% of the partners stated that they have seen a significant increase in the number of accounts produced by employees with the use of Information Technology. 98.11% of the employees stated that they preferred producing VAT returns using Information Technology and 96.23% of the employees stated that they preferred to submit revenue returns using Information Technology. The reduction in the amount of time used to prepare accounts leads to an increase in the productivity of the firm. 100% of the employees stated that the use of Information Technology reduces the time needed to prepare accounts. In addition, 100% of the partners affirm that the use of Information Technology reduces the time needed to prepare accounts and also state that when accounting tasks were completed manually, it was a very time consuming process which led to slower productivity.

5.4 Information Technology and firm size

The second sub-question of the research was to investigate if the use of Information Technology resulted in the reduction in the number of employees within the accounting firm. Previous studies carried out by Ezzamel *et al.* (1997) who investigated the new developments in Information Technology which could have major consequences on the nature of accounting information and on the organisation of the accounting function and Brynjolfsson *et al.* (1994) examined the relationship between Information Technology and firm size imply that the use of Information Technology within an accounting firm results in a reduction in its firm size. 60% of the partners agree with this statement that the use of Information Technology applications has resulted in the reduction in the number of employees within a firm as the improvement in the accuracy of work and the amount of time required to prepare accounts is halved. Furthermore, the Revenue Online System (ROS) has progressed rapidly and can be completed online therefore employees only need to make amendments to them every year thus halving their workload.

5.5 Information Technology and its cost to an accounting firm

The third sub-question of the research was to investigate if the use of Information Technology and its applications proved to be very expensive for the accounting firms. A previous study carried out by Bharadwaj *et al.* (1999) stated that there are reports of mixed findings between the relationship of Information Technology investments and the firm's profitability. The study carried out by Bharadwaj *et al.* (1999) is consistent with the research undertaken as 80% of the partners confirmed that the initial costs, employee costs and training costs proved to be very expensive for the firms. However, they reflected that after taking into consideration the quality of information and the long term benefits, they believe that investment in Information Technology applications is worth the investment. The partners stated that

there is a considerable lack of competition as there is only one supplier of Information Technology applications. However, they did express that the supplier is reliable and its products are of a sufficient standard. This is coherent with a study carried out by Farrell *et al.* (2003) who stated that it is essential for businesses to invest in Information Technology applications from a reliable supplier of which will help to minimise any problems that may occur and will lead to improved performance and productivity.

5.6 Information Technology and accuracy

The fourth sub-question of the research was to investigate if the use of Information Technology and its applications resulted in the improvement of accuracy when preparing accounts and does it reduce the amount of errors occurring. Previous studies carried out by Ezzamel *et al.* (1997:447) who stated that Information Technology can be seen as "improving the accuracy and internal dissemination of information" and Banker *et al.* (2002) who affirmed that when accounts are produced manually, they may be inaccurate. This is similar to the data collected by the researcher via questionnaires and interviews. 96.22% of the employees agreed that the use of Information Technology improves accuracy. Furthermore, 80% of the partners retorted that the introduction of Information Technology assists in understanding employees writing and figures are clearer therefore improving accuracy.

5.7 Information Technology and the time needed to prepare accounts

The fifth sub-question of the research was to investigate if the use of Information Technology resulted in the reduction in the amount of time needed preparing accounts. A previous study carried out by Banker *et al.* (2002) suggested that the use of Information Technology to prepare accounts saves a lot of time as the numbers are generated automatically and

cross-referenced. This study collaborates with the data gathered by the researcher. 100% of the employees stated that the use of Information Technology reduces the time needed to prepare accounts with the majority of the employees 62.26% spending between 71-100% of their time preparing accounts using Information Technology and the majority of the employees 67.92% spending between 1-30% of their time preparing accounts manually. 100% of the partners confirmed that they believe that the use of Information Technology reduces the time needed to prepare accounts in comparison to when accounts were prepared manually, these procedures were very time consuming for the accounting firm. The partners cited that the use of Information Technology and its applications saves time preparing accounts and saves time writing letters to clients. Additionally, submitting revenue returns and preparing VAT returns using the relevant Information Technology applications available reduces the time and effort required from the employees to process these returns. All of this contributes to a more efficient firm.

5.8 Justifying the need for Information Technology

The sixth sub-question of the research was to investigate if accounting firms have experienced difficulty in justifying the need for Information Technology. Previous studies carried out by Powell (1992) who investigated was there any difficulty in evaluating investment in Information technology and Mukhopadhyay *et al.* (1995) who expressed concern in relation to quantifying a business's value of Information Technology because of the large investment in Information Technology made by numerous firms suggested that difficulty may occur in justifying the need for Information Technology. In contrast to the previous studies, 80% of the partners stated that the quality of Information that arise from the systems, the reduction in the time needed to prepare accounts and the benefits associated with using the applications result in the accounting firms having no difficulty in justifying the need for Information Technology.

5.9 Information Technology and the improvement of output and quality

The seventh sub-question of the research was to investigate if the use of Information Technology leads to the improvement of output and quality. A previous study carried out by Mukhopadhyay *et al.* (1997) investigated the impact of Information technology on process output and quality. The results of the study indicated that the use of Information Technology has a positive impact on output and quality. The result of the study is in line with the results obtained by the researcher. 100% of the partners asserted that the use of Information Technology and its applications are very convenient to the firm, with one partner stating that "everything is at your fingertips rather than having to go downstairs and get information from employees." Furthermore, the partners reflected that the use of Information Technology reduces the amount of time needed to prepare accounts and has resulted in an increase in the client base of the accounting firms therefore, improving output. In addition, 100% of the partners have stated that the quality of information that arise from the use of the applications and the benefits associated with them, pay for itself and is worth the money.

5.10 Other aspects in relation to Information Technology

After the completion of the data collection, the researcher found that there are other aspects in relation to Information Technology which the researcher had not addressed when identifying the research aims and objectives. The aspects are security issues in relation to Information Technology, difficulties associated with the use of Information Technology, the difference between the elder versus the more contemporary employees in relation to the use of Information Technology.

A previous study carried out by Stone and Henry (2003) recorded that there are a lot of security threats from within the business relating to Information Technology such computer attacks and hacking. This study is consistent with

the data collected as 64.15% of the employees stated that they believe that security issues may arise when using Information Technology. Additionally, the partners stated that security has become a big issue within the accounting firms. However, the partners alluded to the fact that they have the necessary structures in place to deal with security issues and make sure that all information is stored and backed up.

The results of the data collection indicated that some of the employees have experienced difficulty when using Information Technology and its applications. 26.42% of the employees have stated that they have experienced difficulty when using Information Technology. However, more than half of the employees who have experienced difficulty are aged 50+ which may be as a result of the employees not being exposed to Information Technology at second level or third level. Furthermore, 26.42% of the employees believe that computer anxiety arises in the workplace and more than half of these employees are aged 50+. Additionally, the partners conveyed that some of the employees have difficulty using Information Technology particularly the older employees. However, when the employees are in receipt of the required adequate training, they witness the benefits and improved efficiency which reduces the amount of difficulties occurring.

Moreover, the results of the data collection indicate that the elder or long term employees experience more difficulty using Information Technology and its applications than the more contemporary or younger employees. The results of the questionnaire indicate that the majority of the employees who experience difficulty using the Information Technology applications and who believe that computer anxiety arise in the workplace are aged 50+. Furthermore, the partners indicated that the elder employees experience more difficulty using Information Technology than the more contemporary employees as most of the younger and newer employees had been exposed to Information Technology and its applications during second and third level and when training to become an accountant.

5.11 Conclusion

To conclude, 100% of the partners confirmed that they want their accounting firms to move towards becoming more Information Technology based. Additionally, they acknowledged that after receiving the required training, the employees and management of the accounting firm have become more comfortable using Information Technology and would never turn back to using the old system of preparing accounts manually. This is consistent with the questionnaire response from the employees as 98.11% of them stated they would prefer to prepare accounts using Information Technology.

Chapter 6 – Conclusion

6.1 Introduction

In this chapter, the researcher will draw conclusions on the research, state any limitations that have encountered during the research and make recommendations for further research.

6.2 Overall Conclusion

The primary aim of this research was to understand the impact of Information Technology in accounting firms. The objective of this research was to find out the impact of Information Technology in accounting firms and to measure its impact on a firm's performance and productivity. The researcher can conclude that Information Technology has a positive impact in an accounting firm as the use of Information Technology improves performance, increases productivity, improves accuracy, reduces the time needed to prepare accounts and improves output and quality. With regards to security issues, it is essential that accounting firms have the proper procedures in place to deal with them and try to prevent them occurring. Furthermore, in relation to the difficulties that some employees experience when using information Technology, it is essential that the employees receive the required training to enable them to become more confident using Information Technology and its applications.

6.3 Limitations

The researcher was fortunate that there were very few limitations in relation to the research. The first limitation that occurred was the time constraint in relation to the collection of data and the data analysis as some of the respondents were not available for interview at the time the researcher had

desired. The second limitation that occurred was the participation of the respondents in relation to the interviews as other researchers carried out their interviews with the same respondents. However, the researcher was able to overcome these limitations and complete the research to the best of their ability.

6.4 Recommendations for further research

The security issues and the difficulties associated with the use of Information Technology and its applications are a minor concern. To overcome these issues, it is essential for management to have appropriate procedures in place to deal with the security issues and that the employees receive the required training in relation to the use of Information Technology. However, it is clear to be seen that the positive aspects in relation to the use of Information Technology outweighs the negative aspects.

To conclude a possible area for further research would be to carry out research into the impact of Information Technology in accounting firms in other parts of the country and investigate if employees in the different accounting firms are receiving the same training.

Equally, further research would gauge the opinions of firms throughout the country. This would reflect if the attitudes were similar or antithesis of the research undertaken.

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Appendices

Appendix I: Copy of letter given to interviewee

Research Author:
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Letterkenny

Dissertation title:

AN INVESTIGATION OF THE IMPACT OF INFORMATION TECHNOLOGY IN ACCOUNTING FIRMS

1. I agree to be interviewed for the purposes of the dissertation named above.
2. The purpose and nature of the interview has been explained to me, and I have read the information sheet as provided by the research author.
3. I agree that the interview may be electronically recorded and taped.
4. Any questions and queries that I asked about the purpose and nature of the interview and assignment have been answered to my satisfaction.
5. The interviewee has the option to choose between A, B **or** C (please circle):
 - A. I do not wish my name to be used or cited, or my identity otherwise disclosed, in the assignment.OR
 - B. I agree that my name may be used for the purposes of the assignment only and not for publication.OR

C. I understand that the student may wish to pursue publication at a later date and my name may be used.

Name of interviewee: _____

Signature of interviewee: _____

Date: _____

I have outlined the purpose of the project and the implications of being interviewed to the interviewee. I believe that the consent is informed and that he/she understands the implications of participation.

Name of interviewer: _____

Signature of interviewer: _____

Date: _____

Appendix II: Copy of interview schedule

Section 1 IT and the Accountancy firm

1. How long have you been partner within this Accounting firm?
2. Have you previously worked in another Accounting firm?
3. Have you always been familiar with the use of Information Technology in Accounting firms?
4. Do you believe that the use of Information Technology helps to improve accuracy when preparing accounts?
5. Does the use of Information Technology reduce the time needed to prepare accounts? (Previously, when Accounting firms were not Technology based, can you describe the working environment such as the tools used to prepare accounts? Furthermore, what process did the firm use to submit returns to the revenue?)

Section 2 Applications for Accounts

1. What are your views on the Information Technology applications? i.e. ROS and SAGE
2. When studying to become an Accountant, were you exposed to any of these applications? Did you have any experience in relation to studying with Information Technology? Have you any experience in working with Information Technology?
3. Did you experience any difficulty when using these applications? Such as security issues or break-downs.

4. Do you believe that the introduction of these applications result in the reduction of employees within the firm? Did you have to reduce employee hours or reduce the number of employees within the firm?
5. Do the employees have any difficulty in adapting to the changes in Information Technology?
6. Do the employees have difficulty in using any of these applications? Is there extra training required for them to adjust to the changes?

Section 3 Implications of using IT

1. Do you think that the use of Information Technology and its applications are too expensive?
2. Do you believe that the use of Information Technology helps to increase the productivity within the firm? Have you seen an increase in the number of accounts produced since the introduction of Information Technology?
3. Do you believe that the use of Information Technology helps to improve performance within the firm? Is everyone within the company comfortable using Information Technology and its applications?

Appendix III: Questionnaire

Questionnaire

This is a survey regarding the impact of Information Technology in accounting firms. Please read the questions carefully and answer as honestly as possible. When answering the questionnaire **tick** the relevant box.

Section 1 - Personal Details

Are you male/ female?

What age group do you fit into?

18-35

36-49

50+

How long have you been employed with this accounting firm?

1 – 5 years

6 – 10 years

11+ years

Section 2 - Education

(a) What is your highest educational qualification?

Junior certificate

Leaving certificate

Degree

Masters

Other

If you have other qualifications please specify.

Yes No

(b) If you have previously studied Accounting at third level, where you presented with Information Technology applications which apply to Accounting firms? i.e. Revenue On Line (ROS) and Sage

Section 3 – Accounting Profession

(a) What are your views on Information Technology in accounting firms?

Do you prefer?

- Producing accounts manually
Producing accounts using a computer
Combination of both

(b) How much time do you spend producing accounts manually?

- 1 - 30%
31 - 70%
71 - 100%

(c) How much time do you spend producing accounts using Information Technology based applications? I.e. Microsoft Excel, ROS and SAGE

- 1 - 30%
31 - 70%
71 - 100%

(d) Do you believe that?

- | | | | | | |
|---|---|---|---|---|---|
| Information Technology improves accuracy | 1 | 2 | 3 | 4 | 5 |
| Reduces the time needed to prepare accounts | 1 | 2 | 3 | 4 | 5 |
| Difficulty may arise when using Information Technology | 1 | 2 | 3 | 4 | 5 |
| Security issues may arise when using Information Technology | 1 | 2 | 3 | 4 | 5 |

**(Note: 1= Strongly Disagree, 3= No Preference, 5= Strongly Agree)*

(e)	Yes	No
Did you need training before using IT based applications? I.e. Sage, Microsoft Excel and ROS	<input type="checkbox"/>	<input type="checkbox"/>
Have you experienced any difficulty when using IT?	<input type="checkbox"/>	<input type="checkbox"/>
Do you find IT applications complicated?	<input type="checkbox"/>	<input type="checkbox"/>
Do you think there are security issues in relation to IT? I.e. Hacking	<input type="checkbox"/>	<input type="checkbox"/>
Do you believe that computer anxiety arises at your workplace?	<input type="checkbox"/>	<input type="checkbox"/>

(f) Do you prefer to complete the following tasks manually or by using Information Technology?

	Manually	IT
Calculation of figures	<input type="checkbox"/>	<input type="checkbox"/>
Preparing bank reconciliation statements	<input type="checkbox"/>	<input type="checkbox"/>
Communication with client's	<input type="checkbox"/>	<input type="checkbox"/>
Preparing VAT returns	<input type="checkbox"/>	<input type="checkbox"/>
Submitting revenue returns	<input type="checkbox"/>	<input type="checkbox"/>
To conclude, which method do you prefer to use when preparing accounts?	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for completing this questionnaire.