

IT COMPETENCES FOR PROFESSIONAL ACCOUNTANTS: CASE STUDIES IN THAILAND

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ABSTRACT

Today, Information Technology (IT) is already having a major impact on business whilst the traditional roles of accountants is transforming. IT elements have been appearing to be crucial in triggering changes of accountants' roles. Thus, this study aims to investigate IT competencies among professional accountants to enhance firm performance. This research was conducted with 53 respondents from ten organisations in Thailand. This qualitative research employed interpretive evidence. The results indicate that 19 IT competency factors within the organizational issues were defined. Specifically, these new factors were based on the research findings and the literature and uniqueness to IT competencies for professional accountants, including ERP software skills, BI software skills as well as accounting law and legal skills. The evidence in this study suggests that ERP software, spreadsheets, BI software and accounting software were ranked as much-needed skills to be acquired by accountants while communication skills were ranked as the most required skills and delegation skills as the least required. The findings of the research's empirical evidence suggest that organizations should understand the appropriateness to develop information technology-related competencies for workers in general and for professional accountants in particular and to provide assistance in all processes of decision making.

Keywords: IT competencies, IT competences for professional accountants, IT skills for accounting

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Introduction

IT has changed the way information to be collected, processed, stored, and collected for the arrangement of bookkeeping as well as back related data required by the management to control and manage business activities, therefore bookkeepers were firmly influenced by this change (Bahador & Haider 2013). The importance of IT skills to the accounting profession is additionally highlighted by numerous gatherings, including accounting specialists, academics and professional bodies (IFAC 2003; Chang & Hwang 2003). According to IFAC (2006), the accountancy profession calling confronts various difficulties identifying with IT. Information technologies are changing the nature and financial aspects of accounting action. The career plans of professional accountants, and their cognate training needs, need to be predicated on an authentic view of the transmuting nature of accounting and the profession's role, and the cognizance and skills required for prosperity as a professional accountant. In this way, every professional accountant is relied upon to go about as a user, designer, manager, organizer or evaluator of information systems; or a blend of these parts (Wessel, 2008). It must be recognized that these rules require reasonable IT learning, handy IT aptitudes, association abilities, interpersonal abilities, and other social abilities (IFAC, 2006). Although professional accountants' IT competencies are required by the expert guidelines set by IFAC, very little is known about professional accountants' IT competencies levels, especially in developing economies such as Thailand (Chaikanalukoon, 2011; Thongdeerawisuraket, 2011). There are very few studies available that have investigated IT competencies for professional accountants in developing economies. Those studies; however, have used only one dimension i.e. IT skills to measure accounting practitioners' competence in using IT. Thongdeerawisuraket found in the perspective of accounting managers working in enterprises located in the industrial estate authority of Thailand, competencies of professional accountants are composed of 11 elements. The five most important competencies are knowledge of information technology (.87), intellectual skills (.77), organizational and

management skills (.70), knowledge of organizations and business (.68), and knowledge of accounting and finance (.66)(Thongdeerawisuraket, 2011).

This paper is structured as follows. The first section provides research methodology and research design. The second section is research framework and the third is the main focal point in presenting case findings in IT competencies within the organisational issues. Finally the paper draws conclusions from the case study.

Research Questions and Design

The research framework outlined in Figure 1 shows the foundation for this research which demonstrated the multi-layer multi-tied framework of IT related competencies for professional accountants. In terms of achieving this objective, the following questions will be investigated:

"How do competent professional accountants work in accounting practices using IT?"

The participating organizations that provided accounting and business consultation services were the main sources for the data collection. The reason is that these organizations involved with the highly complex nature of accounting tasks, such as preparing financial reporting, taxation and auditing. Semi-structured interviews were conducted through a one-to-one interview which averaged approximately one hour for each interviewee. A total of eight interviews were conducted with accounting practitioners from the organizations. Managers including company secretarial manager and senior accountants (senior finance accounting, senior company secretarial, senior in business consultation and senior accountant) who are involved in delivering accounting-related and business services in this organization were interviewed.

This research study used a qualitative approach by using an interpretive paradigm whereby the interactions between the phenomenon and context are analysed and interpreted. The qualitative data analysis methods employed pattern-matching, content analysis, and cross-case synthesis. Overall, 10 case studies (semi-structured interviews) were conducted as listed below:

Table 1 Case Study Organisations

Case	Organization Type	Organization Size	Description
A	Industrial	Large	Company manufactures and distributes 5 major product lines, which are protective coating, timber coating, decorative paints, industrial coating and automotive refinish.
B	Education	Large	Government organization with the purpose to extend higher education.
C	Government	Large	Government organization, involved in the maintenance of highway assets and management and operation of a transport system and related infrastructure.
D	Agricultural	Large	Rice milling company engaged in business associated with agricultural products such as jasmine rice, white rice, and glutinous rice.
E	Financial	Large	Banking organization; the bank provides a broad range of consumer, commercial, and corporate banking services, including lending, deposit-taking, credit card services, international trade financing, custodian services, asset management and investment banking services.
F	Industrial	SMEs	Organization of the conventional paper industry, As a leading manufacturer in pulp and paper production, Company F operates altogether three sophisticated paper mills which produce quality products with excellent performance including coated and uncoated paper delivered across domestic and international markets.
G	Education	SMEs	Government organization with the purpose to extend higher education in Thailand.
H	Government	SMEs	Government organization involved in the maintenance of assets and management and operation of Maha Sarakham Province.
I	Agricultural	SMEs	Rice milling company engaged in business associated with agricultural products such as jasmine rice, white rice, and glutinous rice.
J	Financial	SMEs	Banking organization; the bank provides a broad range of consumer, commercial, and corporate banking services, including lending, deposit-taking, credit card services, international trade financing, custodian services, asset management, and investment banking services.

In order to obtain insightful understanding, a number of interviews were conducted for each case study with participants who have relevant roles to

participating organisation that provided accounting and business consultation services. For example,

Table 2 Example of interviewees

Case	Organization Type	Organization Size	Business Nature	Interviewee(s)'s Roles in the Organization
A	Private	Large	Private national manufacturing enterprise	CEO
				Company Secretarial Manager
				Senior Finance Accounting
				Accounting Manager
				Senior IT project
				Programmer
				Director of IT audit division
B	Public	Large	Government organisation in the maintenance of assets	Project manager
				Acting Director of Finance and Division office
				Accountant
				Senior Accountant
				Project manager
				Director of IT
				Accountant
				Programmer
				Director of IT audit division

Research Framework

The Changing Roles of Accountants

Today, is now majorly affecting business, and the conventional part of the accountant is changing (Bahador & Haider, 2013). In addition, IT assumes a basic part in current business, particularly in regards to the accounting function. Utilisation of data innovation to perform accounting functions has conveyed a chance for organisations to advance toward paperless workplaces. Organisations applying a generation system should apply it all the more viable on the off chance that they utilise computerised systems (Ghasemi et al., 2011). According to Sajady, Dastgir and Hashem (2008) information technologies in accounting generally provide financial reports on

a daily or weekly and basis useful information for the decision-making process as well as performance of the organisation. Therefore, information technology has become important for the achievement of the modern day. It is vital to monitor, update and pay greater attention to improving the quality management of information to create and add value so that organisations become trustworthy and reliable (Lee et al., 2002). The progress of innovation likewise can enhance quality and reduce the costs of products or services, encourage productivity by being all around composed, and can make operations more proficient by giving all the more auspicious data, sharing learning, enhancing the productivity and viability of the inventory network, creating inner

control structures and enhancing decision making (Romney & Steinbart, 2006).

Moreover, several authors (Nicolaou, 2000; Phonnikornkij et al., 2008; Ussahawanitchakit & Phonnikornkij, 2006; Xu, Horn Nord, Daryl Nord and Lin, 2003) argue that an accounting system can provide assistance in all phases of decision making. Furthermore, information about the results of previous decisions provides valuable feedback that can be used to improve future decisions. In addition, an accounting system can improve decision making by providing accurate information in a timely manner. Xu (2003) mentioned that business needs to be seen as employing quality accounting systems, and require accounting information quality to manage and operate processes in all sections.

Information has turned into an undeniably essential business asset in supporting organisational decisions. Since innovation making the accounting assignment that would take a gathering of individuals to perform can be expert by one person. It has constrained accountants to overcome difficulties and has taken the chance to climb the company pecking order and to join the administration group. This obliges accountants to have different abilities, i.e. leadership skills, project management and communication skills in analysing organisation's processes and functions for organisations' decision making and risk management (Bahador & Haider, 2012).

IT competences and accounting

IT competencies can be identified as a set of IT skills and soft skills that accountants must possess to use IT effectively (Bahador & Haider, 2013). These competencies are basic for accountants with a specific end goal to play out their tasks (Wessel, 2008). A particular information system which computerises the manual accounting procedures and assignments is frequently known as an AIS. An AIS can gather and store information about exercises

and exchanges, and procedures this information into data that is valuable for choices; it likewise gives satisfactory controls to protect the association's advantages (Phonnikornkij et al., 2008; Romney & Steinbart, 2006; Ussahawanitchakit & Phonnikornkij, 2006). Along these lines, the AIS can increase the value of an association through productively doing those tasks that can be performed through automated systems. Accounting information can improve decision making in several ways: it recognizes circumstances requiring management activity for picking between option activities by decreasing vulnerability. Moreover, information about the aftereffects of past decisions gives profitable criticism that can be utilized to enhance future decisions. Also, an AIS can enhance basic leadership by giving exact information in a timely manner.

Moreover, Basselier, Benbasat and Reich (2003) define IT competencies as the arrangement of IT-related knowledge and experience that a business manager and knowledge worker should possess. The authors propose two measurements; IT-related knowledge and IT experience. IT knowledge refers to specific learning controlled by people i.e., how well they understand fundamental IT concepts, how well informed they are about the utilization of IT in their associations. In the accounting context, Carnaghan (2004) views IT competencies as what might be exhibited by exercises, such as having the capacity to make a spreadsheet or database for a specific reason, or the capacity to utilize software. In considering the definition of IT competencies of professional accountants, it is vital to stress the requirement for both IT skills and relevant knowledge such as management skills, interpersonal skills, and experience of IT (IFAC 2003). Thus, integrating the above-mentioned definitions and discussion, IT competencies in this paper are defined as; "a set of IT skill and soft skills that professional accountants must possess to use IT effectively"

Table 4 Definition of IT competencies

Author(s)	Definition of IT Competencies
Gold and Malhotra (2001)	“the shared IT capability that enables the flow of knowledge in organization to be supported”
Tippin and Sohi (2003)	“consist of three important components, namely IT knowledge, IT operation, and IT object”
Basselier, Reich & Benbasat (2003)	“the set of IT-related knowledge and experience that a business manager possesses”
Carnaghan (2004)	“what would be demonstrated by activities, like being able to create a spread sheet or database for a particular purpose, or the ability to use tax planning software”
Croteau and Raymond (2004)	“to support the effective use and management of IT”
Wessel (2008)	“considered imperative for accountants in order to perform their tasks”
Bahador and Haider (2013)	“the set of IT skills and soft skills that accountants must possess to use IT effectively”

Source: Compiled from various authors

These skills provide such necessary support for IT skills that professional accountants can play out their employments adequately the broad utilization of IS good to go has made the expression “knowledge – worker” in order to describe the worker that operates within an IT environment as well as the competencies possessed. This ownership of suitable skills will permit the formation of a domain where the IS technology will work at an ideal coming about to the upside of the whole business operation (Bahador & Haider, 2012). IT competencies considered basic for accountants so as to play out their errands (Wessel, 2008). The determination of these competencies is vital for accountants but this includes, to start with, the determination of the parts of a present day accountants in business and second, the meaning of term competencies.

The determination of the part of the present day accountant in business is vital as it sets the system inside an accountant works and subsequently this influence the IT/IS tools it is required.

IT Competencies for Accountants

Professional accountants’ skills for achievement are exceptionally required to respond rapidly and viable in associations. Bahador and Haider (2012) admit their examination, distinguished that with the exception of specialized IT skills, various different skills are of equivalent significance to be acquired by accountants keeping in mind the end goal to play out their employment adequately, for example, organizational, conceptual, social and various other skills. These skills are viewed as supplementary to technical IT skills and given backing to them. List of the identified skills can be seen in Table5.

Table 5 Classification of IS abilities/knowledge/skills (Bahador & Haider, 2012)

Skills	Categories / Elements
Technical Skills	Analysis and design, programming language, specific application and general IS knowledge, information system product, database and data communication, advanced applications, computer applications systems, systems theory and concepts, business functional knowledge, technology management knowledge, operating systems, network, personal computer tools
Organizational Skills	Time management, priority, information organization
People skills	Organizational skills, organizational unit, interpersonal, communication, interpersonal relationships, management, professionalism, business, management, social, society, personal trait, professional skills, business knowledge.
Conceptual Skills	Problem solving, abstraction, strategic planning

A framework for IT Competences for professional accountants

Figure 1 shows a summary of case studies findings related to IT competencies for professional accountants. Findings from the pilot case studies – using different types of organization (one large public organization, and one large private organization) informed this summary. The developed model provides guidance on how are the IT related competencies that help professional accountants to perform their job better.

The study indicates that information technology-based competencies framework for professional accountants define 19 stages. Specifically, these new factors based on the research findings and unique to professional accountants were identified by two pilot case studies and are not specifically addressed as important factors in the relevant literature. There are three new factors that have been identified by this research that has not been reported in previous studies. These are:

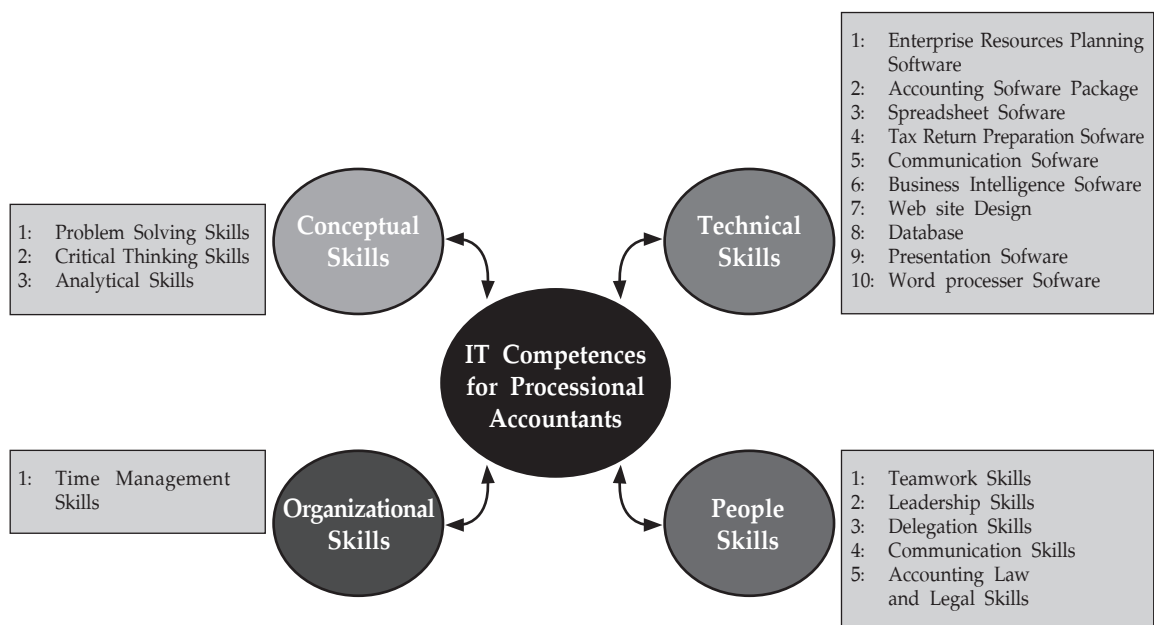


Figure 1 A framework for IT Competences for professional accountants

The 'new' factors identified by this study Factors in Red denote the news factors that are identified from the pilot case study findings.

1. ERP software skills, which demonstrates that an ERP system, the accounting software modules deal with the recording and accounting transactions within functional areas such as accounts payable, accounts receivable and payroll. These functional areas and their relating sub-records will encourage exchanges into the general record where monetary reports are produced for management and external stakeholders. Notwithstanding the transaction or function, it will at last lead back to the general ledger for final review and analysis. Thusly, selecting an ERP solution with functionality rich accounting software functionality is vital to the project's overall success. Thusly, the accountant ought to think about ERP procedures and how to utilize ERP software

into the capacity to work with it is imperative in numerous areas in the organization.

2. BI software skills is a new factor that has been identified by this research but not been reported in previous studies. BI may threaten some traditional accounting roles in delivering management information; however, it presents new opportunities to stimulate stalled finance transformation projects and release management accountants' ability to take on decision support roles and improve decision-making. Moreover, large companies in Thailand require professional accountants who know about BI software to analyze company data and help to make an important decision.

3. Accounting law and legal skills, which indicates that professional accountants must constantly learn new information such as tax law, international standard law, business law and legal for business to support and help their organization.

Findings and Discussion

Technical Skills	
1. Enterprise Resources Planning Software	6. Presentation Software
2. Accounting software package	7. Web site Design
3. Business Intelligence Software	8. Word processor Software
4. Spreadsheet software	9. Database
5. Tax Return Preparation software	10. communication Software

Accounting and finance occupations and technology skills regularly go as an inseparable unit. Capability utilising finance-specific software programs, for example, SAP and Microsoft AX, is a prerequisite in most cases. Cloud computing is also becoming increasingly popular at many companies. It was found that an organisation needs ERP software skills from accountants and professional accountants. This is because ERP package handles the entire range of business functions of an organisation so that can help professional accountants to improve workforce productivity with anytime, anywhere access. As one accounting manager stated:

We used SAP software to help manage information by checking problems and we can get reports from this tool with anytime and anywhere access. So we know the service problems and how to solve them. SAP is the centralization of information, decision-making, and control leads to increase in efficiencies of operation and productivity.

Accounting manager (Case A)

The accountant should know about ERP processes and how to use ERP and the ability to work with it is vital in many areas of the job market.

I think, skills in using ERP are necessary to improve the quality of accounting service and their service as well.

CEO (Case A)

However, SMEs still have problems with an expert person in ERP software – a problem that is related to the lack of knowledge and vision for decision making they may not know what is the accounting information or know of appropriate accounting information, or do not understand or recognize the advantages it brings, and think there is no need to introduce financial software to replace manual accounting, making them largely reluctant to spend too much money on it. in the technology infrastructure and software application suited to the AIS, related to improving the accounting system.

...we don't have people around that know about AIS software and hardware. I think, it is best to purchase the accounting software and hardware from a vendor because the vendor can help to review the specifications and confirm its adequacy as an accounting system for my company.

CEO (Case I)

Another organization noted that the lack of expertise in using ERP software within the accounting area is related to a lack of information quality in the accounting system.

I used XXX (ERP software) to keep track of my money, every month. For example, the accounts, invoicing and billing were pretty good, but it was the VAT and corporation tax which caused my concern. I think we needed an expert person to help...

Accounting manager (Case F)

Accounting software skills

An organization may utilize an off-the-rack accounting software package to record its financial transactions. Programs such as QuickBooks, Peachtree, and Express allow clerical personnel to prepare invoices for customers, enter invoices received from vendors and print checks. Many accounting jobs involve the technical duties of processing accounting transactions. The skills to play out these obligations have known as specialized technical accounting skills. One CFO stated:

We use ACCPAC to help manage information by checking problems and we can get reports from this tool. So we know the service problems and how to solve them. Skills in using ACCPAC

can help accountants to complete the task quickly and accurately'

CFO (Case B)

Notwithstanding to software packages that are designed for the accounting field, jobs typically require proficiency in basic computer operations. Overseeing email records, sharing and printing documents and performing information reinforcements are common tasks.

We have to check our Cash Book fairly closely by Express application and it is definitely one of the highest priorities. We have forecasts that need to be met, so we need to give ourselves early warning signals if a part of the business looks like it is not performing. The numbers will hopefully tell us that, so we can address the issue.

Accounting manager (Case C)

However, Case B has some problems based on using different systems to collect information related to IQ in the AIS. For example, there were various systems used for AIS including Excel, Express, and SAP; as they were not integrated, more effort and resources was sometimes needed in manually duplicating data inputs. Timely data access across different systems was also difficult. The data stakeholders expressed their concerns:

There are different systems to collect information, they are not linked, we manually enter different numbers from the screen to SAP so that we can cross reference.

Accounting manager (Case C)

Another interviewee stated:

We also have GFMIS but it's just not dynamically linked. We don't go from GFMIS front end to Express®, but the consultant has recommended this path.

Project manager (Case B)

In case I, accounting software is not available in line with business requirements; this adds to the workers' problems.

The EasyCut software [Production software] cannot automatically be extracted to WinSpeed [accounting software], e.g. Sales receive the order confirmation documents from vendor's distribution

center once the product is being dispatched, however, this confirmation needs to be manually entered into the system for billing. So a lot of part-time staff are required to do the data entry job, which is time consuming and costly. What they aim to do in the next stage is to use WinSpeed to automate this laborious intensive task.

Accounting manager (Case F)

This could be clarified by the fact that most advanced technology or software used today is extremely advanced and gigantic. This is the reasons why advanced technology skills were not demonstrated by academics as among important skills need to perform the greater part of the work that accountants need to do.

Business Intelligence Software Skills

Employers are looking for skills beyond standard accounting competency. Even junior level employees are expected to do more consulting and assist in strategic thinking. Business Intelligence Software provides a powerful tool to analyze company data and thus helps to make important decisions. business intelligence takes the multitude of transactions generated by an organization and summarizes them into monthly totals that can be delivered on the screen to help managers get an immediate view of business performance. One of the CFO stated:

I use BI software to continuous management of financial and operational functions, with views of past performance, the current state of business, and opportunities for the future

CFO (Case E)

BI is becoming an essential tool in helping finance professionals add value in their organizations. Another accounting manager explained:

I need to get accounting manager who knows about BI software to empower me with information to make better strategic, tactical and operational decisions.

CEO (Case E)

Moreover, large companies in Thailand require professional accounting who knows about BI software to analyze company data and helps to make important decision.

I need to get accounting manager who knows about BI software to empower me with information to make better strategic, tactical and operational decisions.

CEO (Case A)

Moreover, one organization uses BI software tools with associated analysis of the information problems for ensuring information quality management.

Data already contain all the answers you need to improve your business but the answers are not always easy to identify. Understand your data and turn them into quality information.

CFO (Case B)

Spreadsheet skills

The accounting manager indicated that, if computers are available, it could be easier to have a computerized system, rather than a paper system. This would also make it more convenient for staff to read information informally and gain a clearer understanding of requirements.

To simplify discussions organizations should have software and tools such as Excel, PowerPoint, Word, Vision and Outlook and so on, for use in accounting system.

Accounting manager (Case C)

Spreadsheet skill is very useful in the accounting industry. Spreadsheet software is to an accountant what a hammer is to a carpenter. Used correctly, both tools perform effectively and efficiently.

At the end of the day people do financial analysis by extracting data from SAP software back-end systems and shoving it around in Excel spreadsheets to make specifically report.

CFO (Case B)

About all accounting work is computerized, and spreadsheet commonality is essential for technical accounting workers. While an essential comprehension of spreadsheet usefulness is required, the most capable technical accountants can utilize propelled skills for gathering, sort and filter data from accounting systems. In bigger organizations, these skills allow accountants to sort through the large number of accounting transactions that occur each day and acclimatize this information into formats that are useful for decision-makers.

Utilized erroneously, they can botch a job—or at least make it a tedious project. For many CPAs, the data in this article will delineate a portion of the less-known spreadsheet software works that can hone your abilities—and even take you past basic calculating. In case you're an accomplished spreadsheet client, don't accept you're acquainted with all the tips in this article. Look at every; you might be shocked by a capacity that will propel your spreadsheet work.

This article concentrates on Excel 97 in light of the fact that it is by a wide margin the calling's most broadly utilized spreadsheet application; in any cases, its utilization does not infer our underwriting of the item. Know, likewise, those earlier versions of Excel may lack some of the functions described here.

Accounting manager (Case H)

* More examples are available upon request

Table 5 summarises all case studies findings

IT Competences for professional accountants	Large Organisations					SME Organisations				
	Case A	Case B	Case C	Case D	Case E	Case F	Case G	Case H	Case I	Case J
Technical Skills										
1. Enterprise Resources Planning Software	✓	✓	✓	✓	✓	✓		✓	✓	✓
2. Accounting Software Package	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Business Intelligence Software	✓	✓			✓					
4. Spreadsheet Software	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Tax Return Preparation Software	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6. Presentation Software	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7. Web Site Design	✓	✓			✓	✓	✓	✓		✓
8. Word Processor Software	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9. Database	✓	✓			✓			✓		✓
10. Communication Software	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Organisation Skills										
1. Time Management skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conceptual Skills										
1. Problem Solving Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Critical Thinking Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Analytical Skill	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
People Skills										
1. Teamwork Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Delegation Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Communication Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4. Leadership Skills	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. Accounting Law and Legal Skills	✓	✓	✓	✓	✓	✓	✓			✓

Remarks: ✓ = factors that are supported by the specific case study

Overall, this study found that IT competences for professional accountings are presented and found relevant in organisation's IT competency dimensions regardless the actual organisation size. However, in terms of where and how the organisations targeted IT competences efforts, there is a difference between large organisations and SMEs as summarised below:

Table 6 Differences in IT competences for professional accountants' efforts, Large VS. SMEs

IT Competences	Large Organisations	SME Organisations
Technical Skills		
1. Enterprise Resources Planning Software	<ul style="list-style-type: none"> - within an ERP system, the accounting software modules deal with the recording and handling of accounting transactions within functional areas such as accounts payable, accounts receivable and payroll (CFO, Case B) - ERP package handles the entire range of business functions of an organisation so that it can help professional accountants to improve workforce productivity with anytime, anywhere access (CEO, Case A) - ERP skills are very useful in the accounting industry. This software can drive work better, faster decision-making with real-time data and report(CFO, Case C) - accountants ought to think about ERP processes and how to utilize ERP and the capacity to work with it is crucial in numerous regions of the job market(CFO, Case B) - skills to use ERP software can help accountants to finish the undertaking rapidly and accurately(Senior Accountant, E) - you can make utilization of instruments like timetables, ordered envelopes, day organizers, shading coded post-it notes and highlighters, and applications and projects intended to help you stay exceedingly sorted out and in the short-and-long haul (CEO, Case C) 	<ul style="list-style-type: none"> - skills in using ERP are necessary to improve the quality of their service (Accounting manager, Case I) - some organisations lack of skills in using ERP software, so organisation used outsource to help (CEO, Case F) - lack of knowledge and vision, they may not know what is the accounting information or know of appropriate accounting information (CEO, Case J) - not clear understanding of what the real circumstance of this organization was before usage, for example, the level of management, the level of PC equipment and software, technical level, etc. , but they have indiscriminately picked a financial software package which is not appropriate for the situation of the enterprise (Accounting manager, Case F)

IT Competences	Large Organisations	SME Organisations
2. Accounting software package	<ul style="list-style-type: none"> - it's a resource management system that besides checking the business' financials, likewise tracks the accompanying: tangible and intangible assets, human resources, and materials. Intangible parameters incorporate working hours, item life cycles, key execution pointers, and client relations. These are not financials as such, but rather they affect on the organization's finances; subsequently, they are fundamental to your accounting(CFO, Case B) - the technology advancement also significantly influenced the process of decision making and information systems by expanding utilization of accounting software(Accounting chief, Case C) - there have been changes in skills requirement to adapt to the requests of customers' assortment who utilize the different sort of business and information system applications(CEO, Case D) - An organization may utilize an off-the-rack accounting software package to record its financial transactions. Programs such as Quickbooks, Peachtree, and Account Ability allow clerical personnel to prepare invoices for customers, enter invoices received from vendors, and print checks. Depending on the package purchased, a payroll, fixed asset or inventory module may be included. At month-end, financial statements can be printed quickly. Feeling comfortable with one or a greater amount of the regular accounting software programs can be advantageous (Accounting director, Case E). 	<ul style="list-style-type: none"> - accounting package handles just individual business elements of accounts(Accounting administrator, Case F) - most business associations are modernized. They use in any event the Thai local accounting software for creating their financial information (CFO, Case H) - the term is utilized to entirely to allude to the financial aspect of your business operations. These include accounts receivable, accounts payable, payroll, and trial balances. Many vendors bundle accounting software with modules for pertinent business exercises like billing, sales order, purchase order, general ledger, timesheet, expense, and electronic payment(CEO, Case I) - some organisations lack of skill in using accounting software, so organisations used outsource to help (Accounting manager, Case G)

IT Competences	Large Organisations	SME Organisations
3. Business Intelligence Software	<ul style="list-style-type: none"> - BI may debilitate some customary accounting roles in delivering management information yet it exhibits new chances to invigorate slow finance transformation projects and release management accountants' capacity to take on decision support roles and enhance decision-making (CFO, Case E) - BI gives a powerful tool to analyse company data, thus helps to make important decisions(CEO, Case E) - lack of formal concept definitions and decisions makes it hard to create a pragmatic information unwavering quality appraisal system(Accounting supervisor, Case A) - lack of knowledge and vision, they may not recognize what is the accounting information or 	None
4. Spreadsheet software	<ul style="list-style-type: none"> - spreadsheet skills are very useful in the accounting industry(Accounting manager, Case C) - at the end of the day, people do financial analysis by extracting data from SAP software back-end systems and shoving it around in Excel spreadsheets to make specifically report(CFO, Case B) - spreadsheet software is extremely useful, particularly in managing business information and to analyse the information. Skills in utilizing spreadsheets can help accountants to finish the assignment rapidly and precisely (Project manager, Case E) 	<ul style="list-style-type: none"> - spreadsheet skills are very useful in the accounting industry in SMEs in Thailand (Senior Finance, Case C) - skills in using spreadsheets can help records to finish the assignment rapidly and accurately (Accounting director, Case H) - accountants can perform bank reconciliations; calculate job costs, taxes, payment schedules, profit forecasts and stock control. All in all, these undertakings the spreadsheet demonstrates an imperative instrument in encouraging the procedure of estimation and generation decisions(CFO, Case J)

IT Competences	Large Organisations	SME Organisations
5. Tax Return Preparation software	<ul style="list-style-type: none"> - Tax preparation software modules can give your accounting or tax firm with a cost-effective, convenient, and secure method for developing and filing state and federal client tax returns. Tax preparation modules can help you enhance office efficiency, spare time, expand benefits, and offer enhanced customer administration(CEO, Case A) - Tax preparation software helps you calculate and file annual business tax returns for your clients. Utilizing a tax preparation application can save you impressive measures of time and increase your accuracy when completing tax forms, as compared to manually preparing your clients' returns (CFO, Case E) - One of the most important aspects to select the correct tax preparation software is finding a solution that supports the forms you require (CFO, Case C) 	<ul style="list-style-type: none"> - Tax preparation packages also include workflow tools to help make the process of documenting customer returns as productive as would be prudent. in my company, we have document scanning technologies to better manage and input data. The ability to electronically file tax returns is critical for tax professionals. Electronically documenting frames gives reserve funds in both time and cash (Accounting director, H)
6. Presentation Software	<ul style="list-style-type: none"> - need to be able to present your work and your ideas clearly(CEO, Case E) - skills in using presentation software can help accounts to present their work completely(CEO, Case A) 	<ul style="list-style-type: none"> - presentation software skills are very useful in the accounting industry(accounting manager, H) - skills in using presentation (CFO, Case C)software can help accounts to present their work completely(CFO, Case J)
7. Web site Design	<ul style="list-style-type: none"> - in accounting, computer skills in website design is vital in light of the fact that the utilization of programming projects to deliver and record accounting information is increasing (CFO, Case C) 	<ul style="list-style-type: none"> - with the lack of knowledge and vision, they may not realize what is the accounting information or know of proper accounting information(CFO, Case J)

IT Competences	Large Organisations	SME Organisations
8. Word processor Software	<ul style="list-style-type: none"> - word processing empowers word processing to compose their reports, edit and retrieve data or text (CFO, Case B) - if accountants don't have a decent comprehension of IT skills, for instance in an auditor's role, it will make an issue on the grounds that the vast majority of the proof/records are delicate duplicates. Along these lines, how might auditors have the capacity to review organizations in the event that he/she is not acquainted with the audit/accounting programming, which will empower them to extricate the data (CFO, Case C) 	<ul style="list-style-type: none"> - word processing empowers accountants to compose their reports, edit and recover information or text(CFO, Case J) - this software is capable in that archives can be arranged and changed in a profoundly effective way, particularly to sort out financial data (Accounting director, H) - A critical part of an accounting job is regular to furnish management with exact, convenient data to use in deciding. Data may be passed on through reports produced by a software package, or it may be important to gather, combine or sort out the data into a report. Most accounting jobs likewise require the readiness of letters and reminders to sellers, customers, managers or co-workers (CFO, Case J)
9. Database	<ul style="list-style-type: none"> - businesses are looking for accounting professionals who are proficient in the most recent database applications and enterprise resource planning programs. Additionally, many organizations are moving to more advanced systems and analytical tools, so they'll need accounting and finance professionals with solid specialized expertise to adjust rapidly (Acting Director of Finance and Division office, Case B) - information and ability set in outlining and building up a relational accounting database (Senior Accountant, Case C) - understanding of relational database will be advantageous (CFO, Case C) - need experience working with SQL, Oracle(Director of IT review and division, Case B) 	<ul style="list-style-type: none"> - database skills are valuable for accountants, but they are not as critical as spreadsheet and database skills, which are straightforwardly required in the accounting processes (Accounting administrator, Case G) - accounting ought to concentrate on the most proficient method to produce yield from these software processes (spreadsheet, database) instead of focusing on cutting edge technology skills, (for example, ERP, EDI, and network). Besides, there are advanced IT services/people available in the business sector (CFO, Case J)

IT Competences	Large Organisations	SME Organisations
10. Communication Software	<ul style="list-style-type: none"> - provide remote access to systems and exchange files and messages in content, sound and/or video formats between various PCs or users (CFO, Case C) - communication software is an application or project intended to pass data from one system to another (CEO, Case E) - people in different sections within the organization lack sufficient communication skills to work as a whole team; rather they only work on their own tasks/areas related to information quality problems (CEO, Case A) - the company talks to other people via email and apply XXX software (communication software) to talk with other people. However, some people don't use XXX software this is because it is hard to understand all functions and all details(Acting Director of Finance and Division office, Case B) - the capacity to distil complex financial information into everyday language is a must. Financial reporting, treasury management and tax law sway on all territories of business and must be disclosed to differ audiences (accounting manager, Case A) 	<ul style="list-style-type: none"> - communicate information to people or gatherings; convey presentations suited to the attributes and needs of the group of onlookers. Unmistakably and succinctly pass on data orally or in keeping in touch with people or gatherings to guarantee that they comprehend the data and the message. Listen and react fittingly to others. Capacity to build up viable working connections that foster organisational success (Accountant, Case I) - communicate with other in the composed arrangement, for example, utilizing reminder, letters and reports are essential in accounting. Written skills provide the per user with compact, brief and clear information (Accounting director, Case F)

IT Competences	Large Organisations	SME Organisations
Organisation Skills		
1. Time management skill	<ul style="list-style-type: none"> - there are many aspects of the undertaking that should be sorted out or recorded including all documentation, contracts, e-mails, memo's, reviews, meetings, specialist documents, requirements and determinations, reports, changes, issues, dangers, and so on. (CFO, Case C) - a system for managing your workload is just successful on the off chance that you additionally know how to spend plan your time. As an accountant, you'll have to manage contending needs and juggle horde errands – while finishing everything on time. The ability to work inside due dates and to constantly re-organize your schedule will take you far. Not just will it awe your supervisor, colleagues, and customers, it will likewise help you to keep up a solid work/life adjust and keep your everyday profitable (Accounting administrator, Case A) 	<ul style="list-style-type: none"> - apply general learning of relevant applicable information technology to meet work needs (CFO, Case J)
Conceptual Skills		
1. Problem Solving Skills	<ul style="list-style-type: none"> - the ability to distinguish key parts of issues, to identify the reason for issues, to orchestrate helpful data from other data and to suspect and resolve issues in managing important tasks by professional accountants (CEO, Case A) 	<ul style="list-style-type: none"> - professional accountants assess and may resolve remarkable issues that require research and review of policy and procedures and regulations. Apply judgment for issue resolutions or project necessities taking into account appointed authority (Senior Finance, Case H)

IT Competences	Large Organisations	SME Organisations
2. Critical Thinking Skills	<ul style="list-style-type: none"> - the capacity to think past customary thinking and take care of an issue with thoughts and techniques that had not been attempted before (CEO, Case A) - the accounting industry is exceptionally rapid, so accountants who can adjust rapidly and effectively are at an unmistakable point of preference. - having the capacity to give better services to their customers, versatile people will probably learn and develop in their professions since they see each new test as a chance to learn and test their abilities - strategic thinking also requires insight into industry trends and innovative thinking. These days, it's not unusual for financial dynamos to understand what's happening in business and be able to successfully apply to their company or clients 	<ul style="list-style-type: none"> - exhibit a capable level of professional skill and/or knowledge in accounting and keep current with advancements and trends (CFO, Case J) - knowledge and ability to utilize appropriate information technology and systems to meet work needs (Accounting supervisor, Case G)
3. Analytical Skill	<ul style="list-style-type: none"> - analytical skills ability to visualize, and take care of confused issues and make an accurate and informed decision(CFO, Case E) - an accountant's ability to see the master plan, understanding the relationship between financial performance and the more extensive business sector, implies they assume a vital part in mergers, acquisitions and another key, financial activities (CFO, Case A) 	<ul style="list-style-type: none"> - analytical skills are helpful in associations' business function since it incorporates both the ability to utilize great thinking in analysing a situation furthermore the ability to solve problems (CFO, Case G) - many academics, the attention on analytical skills has had influence in controlling the inward environment of organisations (CFO, Case J)
4. Accounting law and Legal Skills	<ul style="list-style-type: none"> - professional accountants must constantly learn new information such as tax, tax law, international standard law, business law and legal for the business to support and help their organisation (CFO, Case D) 	<ul style="list-style-type: none"> - organisation requires professional accountants know about the international standard law, business law and legal for the business to support and help their organisation (Senior Finance, Case I)

IT Competences	Large Organisations	SME Organisations
People Skills		
1. Teamwork Skills	<ul style="list-style-type: none"> - people with different abilities and skills work in gatherings keeping in mind the end goal to fulfill a comparative objective (CEO, Case D) - teamwork is utilized a great deal as a part of the field of accounting with a specific end goal to complete tasks, assess customers, and report/analyze financial statements (Accounting director, Case C) - today's accounting professionals must be cooperative individuals, practicing tact and strife determination attitudes to encourage and advance the achievements of their associates (CEO, Case A). 	<ul style="list-style-type: none"> - set up teamwork to perform brainstorming (e.g. IT team, Project manager, Accountant manager, senior manager etc.), to find solutions and find real problems to solve (CFO, Case J) - the goal of problem analysis is to obtain a clear understanding of the requirements of the client and users. This involves interviewing clients and end users (Accounting manager, Case G) - set up the schedule by doing feasibility and plan analysis and ensuring that the requirements are completed on time and involved technical persons, professional accounting, accountants, programmers for the clearer understanding of analysis requirements (CFO, Case F)
2. Delegation Skills	<ul style="list-style-type: none"> - professional accountants can help the ability to collaborate, cooperate with fellow employees so as to enhance the decision-making process using IT (CFO, Case C) - Delegation is one of the most important management skills (CEO, Case A) 	<ul style="list-style-type: none"> - organizations require good delegation skills (CFO, Case F) - effective delegation is crucial for management and leadership succession (CFO, Case J)
3. Communication Skills	<ul style="list-style-type: none"> - accounting and finance staff should have the capacity to recount the story behind the numbers, especially for associates in different offices less acquainted with accounting standards and language. Both composed and verbal relational skills are basic for achievement in an accounting role (CEO, Case E) 	<ul style="list-style-type: none"> - plan composed and/or specialized items which pass on compact, extensive and precise discoveries and fit in with rules; give fitting documentation to bolster conclusions; may survey and may review and edit the work of others (CFO, Case J) - communication software was recorded as the minimum vital IT abilities necessity required by accountants (project chief, Case I) - accountants are relied upon to speak with customers and additionally their work associates so data is unmistakably comprehended and viable scattered. Respondents were likewise requested that demonstrate their significance level of communication skills (CFO, Case F)

IT Competences	Large Organisations	SME Organisations
4. Leadership Skills	<ul style="list-style-type: none"> - supervisors have an eye on the future and need experts who have solid strong leadership qualities who can venture into more senior parts when the time is correct. They search for people who can maintain a strategic distance from or resolve clashes, adjust well to change, coach others and grasp persistent learning (CFO, Case C) - capacity to rouse and lead individuals to finish certain objectives and destinations (CEO, Case A) - being a good leader means knowing how to guide and instruct, and making yourself congenial and accessible to the general population you're in charge of. You need to adjust being a good example and the individual in control while as yet being a piece of the group. It likewise takes certainty, persistence, and capacity to assign – qualities which don't come effortlessly to a great many people. - leadership skills also incorporate vital thinking and long haul arranging. Many accountants give counselling services, which implies that they offer guidance and business answers for help organizations enhance their operations, so the capacity to look ahead is critical. - the top players in accounting are for the most part known for being visionary – for making logical decisions that additionally include a touch of imagination. To be an effective accountant, you should have the capacity to demonstrate your customers that you're attempting to enhance their present and future (CEO, Case F) 	<ul style="list-style-type: none"> - in accounting it is vital in light of the fact that a considerable measure of work is done in groups and with a specific end goal to meet due dates you need to be able to lead the colleagues into accomplishing their goals (CFO, Case J) - to be an effective consultant, you have to help guide people and sometimes that includes making difficult recommendations. It could even mean making tough decisions. Smaller companies may especially need that assistance

In this research, the results of skills in using IT necessary to improve the quality of services (all variables in this study), were measured by in-depth

interviews. Furthermore, the research summarizes the scores given by different stakeholders in Case A to Case J (the ten organizations).

Information Technology Skills

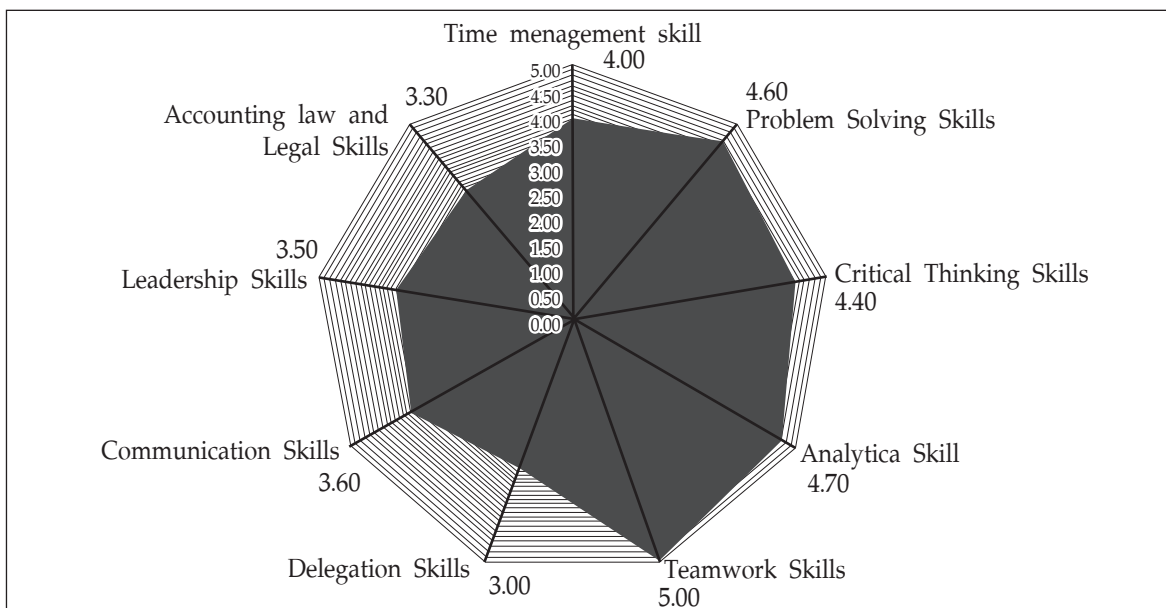


Figure 2 IT skills required by accountants [Source: Developed for this research]

What Are the Necessary IT Skills Required by Accountants?

Figure 2 shows the results of IT Skills required by accountants from ten among the 53 respondents from 10 organisations. The majority of the respondents agreed that skills in using IT are necessary to improve the quality of their work. Fig. 2 shows the ranks and types of IT skills sought by accountants and IT society in ascending order of response. They identified all IT skills which are important. However, Accounting software package (mean score 4.80) and spreadsheet software (mean score 4.60) were ranked as the top skills needing to be acquired by accountants. These outcomes additionally have been supported by the findings obtained from the interview sessions. The statements are:

Respondents were asked to indicate on a scale of five choices consisting of not important agree, little important agree, average important agree, very important agree, and extremely agree. Thai listed organisation firms have average scores of 5 (extremely agree) for any factors were not revealed by the results; an average score of 4 (very important agree) was achieved for accountants including accounting software package, spreadsheet software, and enterprise resources planning software. In

additionally, firms with an average score of 3 (average important agree) addressed factors including website design, presentation software, word processor software, database and communication software. An average score of 2 (little important agree) applied to an area is tax return preparation software; a score of less than 2.00 is business intelligence software

What Are the Soft Skills Required by Accountants?

Soft skills can ensure that employees or workers plan and perform activities as efficiently as possible. Respondents were asked to indicate on a scale of five choices consisting of not important agree, little important agree, average important agree, very important agree, and extremely agree. Thai listed organisation firms have average scores of 5 (extremely agree) referred to the most critical factor which soft skills required by accountants is teamwork skill; an average score of 4 (very important agree) was achieved for soft skills including analytical skills, problem-solving skills, critical thinking skills, and time management skills. And firms with an average score of 3 (average important agree) addressed factors including communication skills, leadership skills, accounting law and legal skills and delegation skills. A score of less than 2.00 for any factors were not revealed by the results.

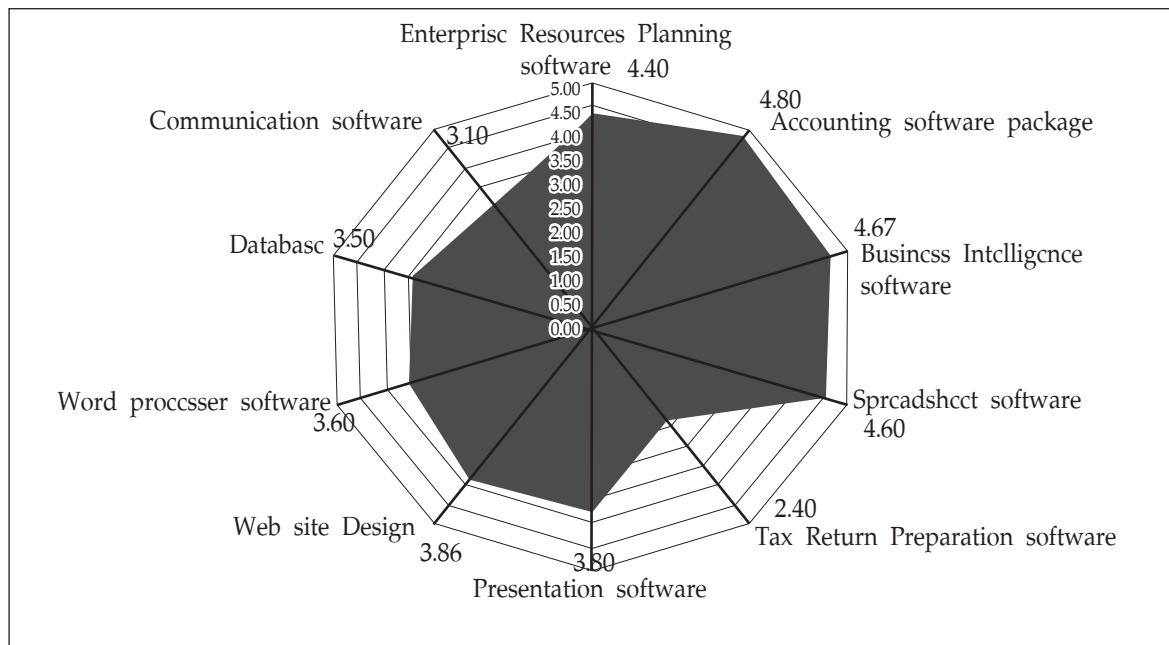


Figure 3 Soft skills required by accountants [Source: Developed for this research]

Conclusion

It must be acknowledged that some differences were introduced by the actual organisation size and beget of accounting information systems and the industry that each organisation belongs to. However, some observations are listed below:

1. In large organisations, ERP software skills effort is more process-driven, regarded as an integrated part of an existing project. In SMEs, some organisations lack of skill in using ERP software, so organisation used outsource to help.
2. In large organisations, BI provides a powerful tool to analyse company data and thus helps to make important decisions. In SMEs, organisations lack of skill in using ERP software.
3. In large organisations, professional accountants must constantly learn new information such as tax law, international standard law, business law and legal for the business to support and help their organisation. In SMEs, the organisation is not attending for.

Besides, IT competence for professional accountants has received increasing attention by organisations worldwide. Accountants ought to comprehend and perceive the particular issues with respect to clients

and elements of IT skills. This conduct will permit them to determine which elements of IT skills and competencies are appropriate to the issue and to guarantee the level of services are at a satisfactory level. As obligations increment in the accounting world, additional software skills might be needed. There are software programs to manage projects, conduct reviews, track depreciation on fixed assets and prepare tax returns. What's more, the organisation should understand appropriate into developing information technology-related competencies for knowledge workers in all processes of decision making.

References

- Bahador, K., & Haider, A. (2013). Information technology competencies for accounting practitioners: a TOPC framework. In *24th Australasian Conference on Information Systems (ACIS)* (pp. 1-10). Bangkok: RMIT University.
- Bahador, K. M. K., & Haider, A. (2012). Information Technology Skills and Competencies—A Case for Professional Accountants. In *Business Information Systems Workshops* (pp. 81-87). Springer Berlin Heidelberg.

- Bahador, K. M. K., & Haider, A. (2013). The maturity of information technology competencies: A professional accountants' perspective. In *2013 Proceedings of PICMET'13: Technology Management in the IT-Driven Services (PICMET)* (pp. 2488-2497). IEEE.
- Bassellier, G., Benbasat, I., & Reich, B. H. (2003). The influence of business managers' IT competence on championing IT. *Information Systems Research*, 14(4), 317-336.
- Carnaghan, C. (2004). Discussion of IT assurance competencies. *International Journal of Accounting Information Systems*, 5(2), 267-273.
- Chang, C. J., & Hwang, I. N. C. R. (2003). Accounting education, firm training and information technology: a research note. *Accounting Education*, 12(4), 441-450.
- Croteau, A. M., & Raymond, L. (2004). Performance outcomes of strategic and IT competencies alignment. *Journal of Information Technology*, 19(3), 178-190.
- Ghasemi, K., Ghasemi, Y., Ehteshamnia, A., Nabavi, S. M., Nabavi, S. F., Ebrahimzadeh, M. A., & Pourmorad, F. (2011). Influence of environmental factors on antioxidant activity, phenol and flavonoids contents of walnut (*Juglans regia* L.) green husks. *Journal of Medicinal Plants Research*, 5(7), 1128-1133.
- Gold, A. H., & Arvind Malhotra, A. H. S. (2001). Knowledge management: An organizational capabilities perspective. *Journal of management information systems*, 18(1), 185-214.
- International Federation of Accountants Education Committee (IFAC). (2003). *Information Technology for Professional Accountants*. Retrieved from <https://www.imanet.org/pdf/ITPA.pdf> (accessed 30 December 2010).
- Jaruwan Chaikanalukkoon, N. P., Akkaradej Chaveeluk (2011). Impacts of Employee Competency on Performance of Accounting Firms in Thailand. *Journal of Accounting and Management*, 3(July - September), 53-61.
- Lee, Y. W., Strong, D. M., Kahn, B. K., & Wang, R. Y. (2002). AIMQ: a methodology for information quality assessment. *Information & management*, 40(2), 133-146.
- Nicolaou, A. I. (2000). A contingency model of perceived effectiveness in accounting information systems: Organizational coordination and control effects. *International Journal of Accounting Information Systems*, 1(2), 91-105.
- Phonnikornkij, N., Sirisom, J., Sonthiprasat, R., Premanichnukul, V., Konthong, K., & Piriyakul, P. (2008). *The implementation of AIS to enhance performance of Thai listed firms: An investigation on the effect of organisation characteristics*. IABE-2008, no. October 19 - 22, 2008, Las Vegas, Nevada, USA.
- Romney & Steinbart, (2006). Accounting Information System. *ACCT203 - Accounting Information System - AY2005-2006 Term 2*
- Sajady, H., Dastgir, M., & Hashem, H. (2008). Evaluation of the effectiveness of accounting information systems. *International journal of information science and technology*, 6(2).
- Tippins, M. J., & Sohi, R. S. (2003). IT competency and firm performance: is organizational learning a missing link?. *Strategic management journal*, 24(8), 745-761.
- Ussahawanitchakit, P., & Phonnikornkij, N. (2006). Roles of Information Technology Capability in Accounting Information Quality. *International Journal of Business Research*, 3(1), 133-140.
- Wessel, P. J. (2008). The Identification and Discussion of Strategies for Implementing an IT Skills Framework in the Education of Professional Accountants. *South African Journal of Accounting Research*, 22(1), pp 147-181
- Xu, H. (2003). *Critical Success Factors for Accounting Information Systems Data Quality*. Doctoral dissertation, University of Southern Queensland.
- Xu, H., Horn Nord, J., Daryl Nord, G., & Lin, B. (2003). Key issues of accounting information quality management: Australian case studies. *Industrial Management & Data Systems*, 103(7), 461-470.