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Present status and perceived importance of computer skills in a Taiwanese service industry

En-Ming Tseng
University of Northern Iowa

PRESENT STATUS AND PERCEIVED IMPORTANCE OF COMPUTER SKILLS IN A TAIWANESE SERVICE INDUSTRY

A Dissertation

Submitted

in Partial Fulfillment

of the Requirements for the Degree

Doctor of Industrial Technology

Approved:

Dr. Charles D. Johnson, Advisor

Dr. John T. Fecik, Co-Advisor

Dr. Douglas T. Pine

Dr. David A. Whitsett

Dr. Paul W. F. Chao

Dr. Andrew R. Gilpin

En-Ming Tseng

University of Northern Iowa

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Dr. Charles D. Johnson, Advisor

Dr. John W. Somervill
Dean of the Graduate College

En-Ming Tseng

University of Northern Iowa

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ABSTRACT

The purpose of this study was to provide researchers, computer technologists, management and trainers with information concerning the current status and importance regarding computer skills for agents in the Taiwanese life insurance industry. In addition to identifying important computer skills for this population, this research investigated differences in perceptions of computer directors (major computer system developers), sales managers (major training providers), and life insurance agents (computer end-users) regarding the current status and importance of computer skills for life insurance agents.

Survey instruments were developed through the literature review as well as through expert interviews and validations. Investigated samples include all 30 computer directors of member companies of the Taipei Life Insurance Association, 200 randomly selected members of the General Agents and Managers Association, and 400 randomly selected members of the Life Underwriters Association in Taiwan. A 55.2% usable return rate was reached.

Based on the data analysis, 49 important skills were identified in 8 categories including basic computer skills, database management, spreadsheet, word processing,

communication, presentation, computer-based training, and artificial intelligence. Using a five-point Likert Scale, the means for importance level were found to be between 3 (moderate) and 4 (fairly high): 3.29 from agents, 3.71 from sales managers, and 3.59 from computer directors. The mean for levels of current expertise were between 2 (low) and 3 (moderate): 2.38 from agents, 2.60 from sales managers, and 2.46 from computer directors.

One-way ANOVAs at the .05 level were used to detect the existence of differences of perceptions among the three groups. The Fisher's Least Significant Difference Procedure (three t-tests at the .01 level) was used for all significant ANOVAs found in previous stages to identify the significant differences between each two groups. The majority of significant differences, 28 out of 49 regarding importance level and 8 out of 49 regarding level of expertise, were found between sales managers and agents; 4 significant differences concerning importance level and 1 concerning level of expertise were found between sales managers and computer directors; only 4 items related to importance level were found significantly different between agents and computer directors. However, the ranking of both levels of importance and expertise showed more consensus between agents and sales managers than agents and computer directors. However, because of the difference in sample sizes, this finding should be interpreted with caution.

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CHAPTER I

INTRODUCTION

No one in developed countries, neither company nor individual, is able to avoid the impact of the computer. On the average, every American home uses more than 100 kinds of microprocessors (Porter & Miller, 1991). Also, every American is confronted by more than 50 computerized devices from the time he/she begins the day and arrives at the office. These devices include everything from a tiny computer mechanism in a digital clock radio or coffee pot to a computer-controlled traffic light (Heller & Martin, 1982).

In the workplace, the development of computer-related information technology is a challenge to business organizations (T. Y. Liang, 1993). In a survey conducted by The Olsten Corp. (1993), three-fourths of the 1481 information system executives expressed the opinion that the computer skills of employees greatly affected the operations of their companies. Seventy-one percent of the companies surveyed replied that computer skills were a requirement for the managers and supervisors in their companies, whereas only 36% percent responded this way in 1990. They felt that computer literacy was needed from the lowest to the highest level positions, from clerks to top executives (The Olsten Corp. 1993). Another survey of 443 organizations produced similar results, high-lighting the increasing needs for

computer skills and ranking computer skills as some of the most important skills for the future (Laabs, 1993).

The dramatic advance of this technology will keep increasing the importance of being able to use the computer effectively, since a company's advantages are dependent upon employee skills in the use the computer rather than the number of computers the company owns (Boom, 1992). Consequently, it appears that computer skills are quickly becoming the major factor for success for both the company and the individual (Nelson & Hall, 1991).

Statement of the Problem

The problem of this study was to identify important computer skills for life insurance agents in Taiwan, and to compare the perceptions of computer directors, sales managers, and agents regarding the importance of these skills. In addition, the present level of computer expertise of agents was determined and compared with perceived importance.

Statement of Purpose

The purpose of this study was to provide computer technologists (both hardware and software designers), researchers, management and trainers in the life insurance industry in Taiwan with information concerning the current status and training needs regarding computer utilization for life insurance agents. Also, this research investigated differences in perceptions of computer directors (major

computer system developers), sales managers (major training providers), and life insurance agents (real computer end-users) regarding the current status and importance of computer skills for life insurance agents.

Statement of Needs

The need for this study was based on (a) the widespread use of computers in industry, (b) the need for data that can be used to develop appropriate computer training, (c) the need to involve the end-user in training needs assessment, and (d) the need for research on computer utilization in the work of life insurance agents.

The Widespread Use of Computers in Industry

Technology has dramatically changed the way humans live and work (T. Y. Liang, 1993). The computer has been one of the most widely used and significant advances in technology. In order to remain competitive in the future, people must realize the influence of these rapid and inevitable changes in technology (Sangpongchaval, 1986). Most specifically, since the business environment has become more and more competitive, companies that want to be successful need to focus on sensing and responding to rapidly changing customer needs; computer utilization enables companies to respond more effectively to these rapidly-changing customer needs (Haeckel & Nolan, 1993). The powerful data-processing and calculating capabilities of computers have been heavily used in both the manufacturing and service industries (Smith &

Mckeen, 1993). More and more workers, with or without computer training, have come to rely on computers to accomplish their daily work (Davis & Bostrom, 1993). In addition, the investment by industry in computer-related resources has grown tremendously in recent years (Lassila, 1992; Smith & Mckeen, 1993). Researchers assert that computer utilization in industry is no longer a competitive advantage; it is a necessary tool for survival (Breidenbach, 1994; Colombo, 1994). Therefore, the widespread use of computers in industry has made computer utilization an important topic of research.

The Need for Data That Can Be Used to Develop Appropriate Computer Training

Although computers have been widely used at all levels of work in industry, this does not guarantee that they are being used to their full capacity (Lassila, 1992). According to Brynjolfsson (1993), one of the reasons that the large investment in computers has not resulted in increased productivity in the U.S. is that they are not being used effectively. Many barriers remain for effective computer utilization, one of the most important being a lack of appropriate training (Goode, 1990; Gragg & King, 1993; Knupfer, 1987; White, 1992).

Marquie, Thon, and Barcat (1994) have suggested that training can reduce fears and feelings of disruption. According to Popedavis and Vispoel (1993), as well as

Torkzadeh and Koufteros (1993), computer training has been identified as one of the most influential factors in expected user attitude (e.g. greater motivation, more confidence, and less anxiety). Not only has such training become essential for industry to succeed in a competitive environment (Hodson, Hooks, & Rieble, 1994), but employees themselves request more training and administrative support, they also view training as a highly motivational incentive (Goode, 1990).

Training programs have not automatically guaranteed the transfer of learning into practical use. Georgenson and Delgaizo (1982) estimated that although American industry spends more than 100 billion dollars every year in training, less than 10% of that effort has been actually transferred to the job. Brinkerhoff (1989) supported this estimate through the evaluation of a training program in a leading Fortune 500 company. The results of the evaluation indicated that almost every trainee showed a proficiency in certain skills and knowledge gained from the training program, but only 9 percent of employees were using these skills in the workplace. According to Smith and Mckeen (1993), this trend of significant investment in computer training is likely to continue and executives in industry will begin to reassess the value of computer training in the next decade.

In summary, most of the problems involved in the successful use of the computer have been caused by a failure to implement adequate training programs (Foley & Watts, 1994). Based on the evidence cited, it is important for workers in industry to receive computer training.

The Need to Involve the End-user in Training Needs Assessment

In order to enhance the effectiveness of training and transfer computer course content into the workplace, it is necessary to determine the point of view of the end-user. A training needs assessment is required to gather reliable information (Sangpongchaval, 1986), which will ensure the use of effective methods to help trainees develop needed specific skills and achieve maximum performance (Gleason, 1991). Unfortunately, most of the course content has been developed by experts in large companies or sales managers in small firms. It has been rare in industry to take into consideration the end-user's input when planning, conducting, and evaluating training programs (Honeycutt, Ford, & Tanner, 1994; Honeycutt, Howe, & Ingram, 1993). However, end-user involvement significantly affects user satisfaction (Amoakogyamlpah & White, 1993; Hawk, 1993) and enhances the effectiveness of the transfer of technology within industry (Leonardbarton & Sinha, 1993). Horwitz (1988) also has indicated that the involvement of the trainee in the development of training should improve

learning by trainees. In fact, the trainee/end-user is a key person in the process of training. The pride of ownership of the users in the whole process plays a significant role (Lassila, 1992). Nelson and Hall (1991) argued that it is almost impossible to be successful with information systems in an organization without an understanding between end-users and information system personnel. In addition, McEnery and McEnery (1987) have stated that both end-users and managers should be involved in training needs assessment for end-users since many assessments get information only from managers, who often respond by projecting their own needs into the assessment. Therefore, it has become vitally important to involve users in the assessment of training needs.

The Need for Research on Computer Utilization by Life Insurance Agents in Their Work

The computer has already become one of the most important elements in life insurance operations. This industry has to depend upon computers to run the business and establish a competitive position (Codington & Wilson, 1994). Inyang (1993) argues that the benefits of using computers for life insurance agents include saving time, maintaining a competitive advantage, presenting a better professional image, providing better customer service, and experiencing a higher rate of productivity. Life insurance agents sell invisible protection; their customers never

actually see any of this protection until unpleasant events occur. The customer only sees the agent who sells the policy. Therefore, it is extremely important for the agent to present a professional image, thus reinforcing the fact that insurance policies offer needed protection. Because the agent is the only part of the life insurance industry that the customer encounters, the professionalism of the agent determines the perception of the public toward this industry and the desire of the individual to buy the product as well (Colombo, 1994). In his study, Inyang (1993) concluded that the use of the computer in a sales situation correlated significantly with the productivity of the life insurance agent.

In order to face the challenge of an increasingly competitive environment, salespeople in all industries must enhance their productivity, both in quality and quantity. Without the assistance of computers, it has become almost impossible to achieve these goals, which are higher than ever before. The use of computers by a sales force is a competitive necessity rather than simply a competitive advantage (Colombo, 1994). Since no existing research focusing on agent computer training has been found, and since this has become an important component of survival in this industry, agent computer training is a significant topic for study.

Statement of Research Questions

This study was designed to answer the following questions:

1. What are the important computer skills for life insurance agents in Taiwan?

2. What is the level of importance of computer skills for life insurance agents, as identified by life insurance agents themselves, sales managers, and computer directors?

3. Do differences in perception exist among life insurance agents, sales managers, and computer directors concerning the importance of computer skills?

4. What is the present level of agent expertise regarding identified computer skills, as rated by life insurance agents, sales managers, and computer directors?

5. Do differences in perception exist among life insurance agents, sale managers, and computer directors concerning the present level of agent computer expertise?

Assumptions

The following assumptions were made in the pursuit of this study:

1. Those experts who were chosen for the validation of the questionnaire had a thorough understanding of both computer technology and life insurance agent work, and had contributed their expertise appropriately in developing the list of important skills for agent use of computers.

2. All respondents in the study understood the instrument questions and gave truthful answers.

3. The translation of the questionnaire did not affect its meaning.

Delimitations

The following delimitations were necessary in the pursuit of this study:

1. This study was delimited to members of the Life Underwriters Association (LUA), the General Agents and Managers Association (GAMA), and the Taipei Life Insurance Association (TLIA) in Taiwan, who are presently employed in the insurance industry.

2. This study was delimited to the agents' current status and the importance of computer skills in their work.

3. The computer skills chosen in the questionnaire were based upon the literature review and the collection of opinions of those experts selected.

Limitation

The questionnaire depends upon self-reported data, as well as subjective opinions and perceptions.

Statement of Methodology

The methodology for this research has been described in this section, which is divided into (a) population, (b) sample, (c) instruments, (d) data collection, and (e) data analysis.

Populations

The population examined in this study consisted of (a) over 3000 members of the Life Underwriters Association in Taiwan, (b) over 500 members of the General Agents and Managers Association in Taiwan, and (c) all 30 directors (specialists) of the computer departments in life insurance companies in Taiwan. Those association members who were not currently active in the insurance industry were excluded from the population.

Samples

The sample for this study consisted of (a) 400 randomly selected agents from members of the Life Underwriters Association (LUA) in Taiwan, (b) 200 randomly selected managers of the General Agents and Managers Association (GAMA) in Taiwan, and (c) 30 directors or specialists appointed by the director of the computer department in each member company of the Taipei Life Insurance Association (TLIA).

Instruments

A mail questionnaire was used in this study. The first draft of important computer skills was constructed from related literature and interviews with six experts, selected from the recommendations of the three associations mentioned previously. Then, the second draft of the lists of important computer skills was sent to these experts for a final review. After the final list of important computer

skills was validated by experts, the mail questionnaire was developed, incorporating this list.

Sax (1979) has argued that, in comparison to other data gathering techniques, the mail questionnaire is cheaper, provides wider geographic coverage, gathers more uniform data that is easier to compare, elicits more candid replies because of the anonymity it affords, and provides more accurate results since respondents are able to check their replies. The mail questionnaire has been chosen for use in this study for these reasons.

There were two parts in the survey questionnaire. The first part was designed to gather information on insurance agents' proficiency in computer skills, as well as the perceived importance of these skills for life insurance agents in Taiwan. These questions for the first part were those computer skills identified via the six experts. The second part included demographic information.

The developed instrument was translated and submitted to the faculty advisory committee for needed criticism. The instrument was revised according to the advice of the committee and translated back into Mandarin Chinese.

In order to avoid ambiguity and format problems, members of a pilot test group, chosen from the three different populations, were selected to assess the instrument. Necessary corrections were made according to

the suggestions of the pilot test group and the analysis of the results in the pilot test.

Data Collection

The first wave of data collection was accomplished by identifying a list of important computer skills in the literature review and validating this list through interviews with experts. Then the revised list of important computer skills in agents' work was sent to the same experts for final validation.

In the second wave of data collection, the questionnaire was sent to randomly selected members of the LUA and GAMA in Taiwan and the director of the computer department in each member company of the TLIA.

Four hundred members of LUA were selected by using a random number table, and 200 (50%) usable responses were expected. Two hundred members of GAMA were selected by using a random number table, and 100 (50%) responses were expected from selected managers. At this time, there are 30 life insurance companies in Taiwan. All directors of the computer departments in these companies received the questionnaire. The questionnaire was answered either by the director or another specialist appointed by the director. Fifteen questionnaires (50%) were expected to be returned from this group.

A cover letter with association endorsement, and a self-addressed, stamped envelope were enclosed with the

questionnaire. The first follow-up letter, with a self-addressed, stamped envelope and questionnaire, was sent to the non-respondents after two weeks. The second follow-up letter was sent to the non-respondents after another two weeks. The expected total response rate was 50%.

All respondents from the three groups were asked to rate each item on the computer skill list in the first portion of the questionnaire regarding the present level of agent computer expertise and importance for the job. A Likert scale was used for each.

Data Analysis

The process of data analysis was as follows. The researcher:

1. Conducted a frequency distribution to analyze the demographic data.

2. Added each item on each scale to produce a mean score on the importance of computer training items and a score of current level of computer skill on each topic.

3. Performed an ANOVA on the scores of the current level of computer skills of the agents, as perceived by the three groups.

4. Conducted an ANOVA on the scores of the importance of computer skills for the agents, as perceived by the three groups.

5. For each item on each scale, conducted another ANOVA comparing ratings by each of the three groups.

6. For all significant ANOVAs in the 3rd to 5th items above, performed three t tests (at .01 level) to identify any significant differences among the three groups. This procedure is known as Fisher's "Least Significant Difference" procedure (Howell, 1989).

Definition of Terms

The following terms were defined to clarify their use in the context of this study:

1. Training need: "A training need exists when an employee lacks the knowledge or skill to perform an assigned task satisfactorily" (Laird, 1985, p. 46). Thus, in this study, training need meant the perception of the demand for correcting any deficiency in knowledge or skill in order to effectively use computers in agent work.

2. Computer skill: Skill means "knowledge of the means or methods to accomplish a task" (Gove, 1971, p. 2133). In this study, computer skill was identified as the application of computer knowledge in the work of the life insurance agent.

3. Computer utilization: Any instance in which the agents' task or activity was accomplished via computer, such as making a financial proposal, writing a business letter, or conducting a sales presentation by using the computer.

4. Agent: A person who represents another person/organization in doing contracted business. In this study, the agent meant any person whose work includes

dealing with customers and selling life insurance policies in Taiwan.

5. Expert: A person who is good at or skilled in a particular area of knowledge or activity. In this study, the expert was defined as a person who is knowledgeable both in computer applications and agent work, and identified as such by the three life insurance associations.

6. Manager: One who leads or manages a group of people in an organization. In this study, the manager was defined as the person who leads a group of agents in a life insurance agency in Taiwan. Usually, these managers not only supervise agents, but also train them in different kinds of sales skills, including the needed operational skills of computer utilization in the agency.

7. Director: "a head or chief of an organized occupational group" (Gove, 1971, p. 641). In this study, the director is the person who was in charge of the computer department in a life insurance company.

8. Service industry: Any industry whose major business is providing the customer with nonmaterial things or satisfying certain demands of consumers, such as transportation, communication, finance and trade. The life insurance industry has been defined as one such industry.

Summary and Description of Subsequent Chapters

This study has been designed to provide computer technologists (both hardware and software), researchers,

management, and insurance agents with information regarding important computer skills for life insurance agents in Taiwan and their current status in the utilization of computers. The differences in the perceptions of directors, managers, and agents also have been compared, and the implications for agent computer training have been discussed.

Chapter Two contains a review of relevant literature. It provides a background on research in the identification of important computer skills. It also provides review of studies relevant to the tasks of life insurance agents and the environment of Taiwanese agents. The research relevant to computer applications for agents is also examined.

Chapter Three consists of a detailed description of the methodology used for the research in this study. For instance, expert validation, survey research, and statistical methods are discussed in this chapter.

Chapter Four reports the findings and analysis of the data. The delineation of the findings of this study and the statistical analysis of results are also presented in this chapter.

Chapter Five summarizes the results of the study and presents conclusions and recommendations. Conclusions and recommendations are based both upon the literature and the results of this study.

CHAPTER II

LITERATURE REVIEW

Introduction

This review of the literature is concentrated in four major areas: (a) identification of computer skills, (b) tasks of life insurance agents, (c) the environment of Taiwanese life insurance agents, and (d) the utility of computer technology.

Identification of Computer Skills

The rapid development of computer technology has caused increasing investment in computer-related facilities (Boddie, 1993; Willcocks, 1994; Zarley, 1988). Zarley (1988) forecast that computer technology would be one of the most valuable assets in industries, especially for financial and service industries where this technology may involve 30% of the total capital assets. Any company that expects to reap the largest benefit from computer investment must be prepared to enable the worker to acquire needed skills and to use the computer efficiently (Boddie, 1993; Gattiker, 1988; Ladd, 1989; Rifkin, 1991; Willcocks, 1994).

Due in large part to the dramatic development of computers, the American people have experienced first hand the fast pace of the information society. In order to live and work in this new environment, everyone needs the ability to use computer-related technology effectively in his/her life, including home, school and workplace (Deringer &

Molnar, 1982; Kay, 1989). In the conference entitled "National goals for computer literacy in 1985," supported by the National Science Foundation, a select group of leaders in education and computing research agreed that the ability to use computers was an urgent national need (Kay, 1989).

Moreover, Molnar (1978) pointed out that the lack of knowledge in computer literacy would directly cause the next great crisis in education. The ability to use computers is the essential answer for American people to solve those serious problems they face, such as declining national productivity, increasing international competition, and maintaining national defense and safety (Deringer & Molnar, 1982; Kay, 1993).

Golan (1994) and Seidel (1982) suggested several reasons why everyone should attain computer skills, and that the acquisition of computer skills is a major trend in this society. Seidel (1982) mentioned that:

> * Our society, collectively and individually, must handle increasing amounts of information;
> * Individuals need to become better problem-solvers;
> * Computers are a major component of the work environment to help solve problems and handle information. (p. 19)

Therefore, the requirement of computer literacy for most people in society will be expanded dramatically (Molnar, 1978).

Defining Skills

According to Gattiker (1992), the term skill is not easy to define. Gattiker (1992) described two different kinds of skills, "either individual (holds certain type of skills) or job centered (skills are inherent in job, based on task design and workflow)" (p. 549). He further noted that the term skill also appears in economic literature and is usually separated into firm-specific and general skills. Adams (1987) claimed that it is difficult to give a definition of skill. However, the defining characteristics he mentions in his review of human motor research are that "(1) Skills are a wide behavioral domain in which behaviors are assumed to be complex; (2) Skills are gradually learned through training; and (3) Attaining a goal is dependent upon motor behavior and processes" (p. 42).

In the sociological field, researchers have emphasized the organization or job, rather than focusing only on the individual. Sociological researchers have delineated two dimensions of skills: (a) substantive complexity, which means the level, scope, and integration of mental, manipulative, and interpersonal tasks in a job, and (b) autonomy-control, which implies the discretion or leeway available in a job to control the content, manner, and speed through the accomplishment of the task (Spenner, 1990). According to Gove (1971), skill means "knowledge of the means or methods of accomplishing a task" or "the ability to

use one's knowledge effectively and readily in execution or performance" (p. 2133) of a task.

Defining Computer Skills

Almost everyone believes in the importance of computer literacy, but nobody seems to know exactly what it is. (Hassett, 1984; Longstreet & Sorant, 1985). Gattiker (1992) defined computer skills as learned behaviors needed for achieving desirable performance levels when doing computer-mediated tasks. Youst and Lipsett (1994) noted that people in contemporary society need physical as well as technological fitness, which means having the right skills at the right time at the right cost. From the point of view of identifying and developing technical skills, terms like literacy, ability, competency, expertise, proficiency, and know-how are the same as skill.

It has become very important, but difficult, to define the term computer skills for technology and training research. The term computer literacy emerged in 1972 (Lombardi, 1983) and the availability of microcomputers to average people has caused the concept of computer literacy to be further developed since 1978 (Kay, 1989, 1993). However, there is no consensus regarding computer skills, or, as it is usually referred to, computer literacy. Its definitions are ever changing and affected by the rapid development of hardware and software (Kay, 1993).

Computers and computer literacy have been discussed in many publications, institutes, and companies. The concept seems to be pervasive (Lombardi, 1983). But the term signifies different things to different people, depending upon the person's particular involvement with computers (Molnar, 1978). To children, it means familiarity with microcomputers and the ability to correctly operate the machine. To computer experts, it means that one comprehends Boolean logic, understands computer architecture, and knows at least three computer languages (Molnar, 1978). Computer literacy may be everything in between or even all of these. Rhodes (1986) supports this notion by his personal needs approach, which defines computer literacy as the ability to use the computer to satisfy one's own needs.

Some researchers have defined computer literacy as knowledge of the computer, including how computers work, how computers are used, and the impact of computers on society (Johnson, Anderson, Hansen, & Klassen, 1980). Computer literacy should also include the ability to interact with computers and a wide comprehension of the role of the computer in society (Anderson, 1982). Watt (1982) has argued that these definitions indicate only computer awareness. He has provided a definition through four interrelated categories:

> (a) the ability to control and program a computer to achieve a variety of personal, academic, and professional goals, (b) the ability to use a variety of

> pre-programmed computer applications in personal, academic and professional contexts, (c) the ability to make use of ideas from the cultures surrounding computer programming and computer applications as part of an individual's collection of strategies for information retrieval, communication and problem solving, (d) the ability to understand the growing economic, social and psychological impact of computers on individuals and groups within our society and on society as a whole. (p. 57)

Longstreet and Sorant (1985) noted that computer skills are the ability to adapt the use of new hardware and software flexibly to process text, data and graphics in a computer environment. The Minnesota Educational Computing Consortium (MECC) Computer Literacy Study defined computer literacy as the needed knowledge and skills for general people to deal with computers, such as the awareness of what computers can do and how to use those available functions to finish a task, rather than the ability to program (Grierson, 1985). Lombardi (1983) stated the following:

> Computer literacy means the ability to recognize problems for which the computer may be a useful part of the solution. Computer-literate adults will be able to identify appropriate computer resources for a wide range of tasks, and they will know how to ask the experts for assistance in finding solutions using computers. (p. 2)

So, a definition should include (a) a hardware concept, (b) a software and data processing concept, (c) programming and algorithms, (d) application principles, (e) social implications, and (f) a favorable or well-informed affective orientation (Anderson, 1982).

Kay (1989) has drawn the conflicting definitions of computer literacy from the related literature into five different categories: (a) a specificity approach: emphasizing one specific component of skills and considering it as the most important one among all skills, (b) a global approach: including all components at different levels, (c) a planned approach: developing a carefully thought-out plan to solve the problem of hit-and-miss learning, (d) an evolution approach: viewing computer literacy as a continually changing concept, incorporated with the development of hardware and software, and (e) an individual needs approach: defining computer literacy as a personal concept which depends upon individual needs. After examining the five different approaches, Kay (1989) suggested the individual needs approach as the best method to adopt for the practical environment today. This means that the important computer skills for a person should be determined by his/her own needs rather than by the content of computers.

According to Kay (1992), it has been confusing to study the research about computer literacy, which is indeed chaotic without consensus in regard to definitions. It should also be noted that the definitions of computer literacy have changed in accord with the evolution of computer hardware and software. Advances in computers have led to the categorization of computer literacy in

educational research into six different historical stages (Kay, 1992): (a) computer awareness: a focus on the most theoretical concepts, before 1978, when only a few elite had the chance to access mainframe computers, (b) programming: a focus on the use of computers by writing computer programs, when the microcomputer was introduced, (c) evolving concept and planning: a focus on demands to catch up with the explosion in computer technology, when hardware prices fell and software quantities increased quickly, (d) behavioral approach: a focus on the use of the computer as a tool, when numerous software packages became available in the market, (e) reaction and process:a focus on the evaluation of computer literacy from a more critical perspective, when user-friendly software allowed the user to perform high-level tasks through basic computer skills, (f) personal needs: a focus on an individual's personal needs and a view of computer literacy as a process, now that overwhelming technological developments have made attaining all skills needed to run computers for every task impossible (Kay, 1992).

Identifying Computer Skills

Although "It is necessary to identify which skills the individual requires to perform effectively when doing computer-mediated tasks, unfortunately the EUC (End User Computing) literature does not provide the reader with a clear picture on this subject" (Gattiker, 1992, p. 549).

Levin (1983) identified the fundamental skills a student needs to have as:

> * The ability to control a program and a computer to achieve a variety of personal, academic and professional goals.
> * The ability to use a variety of preprogrammed computer applications in personal, academic and professional contexts.
> * The ability to understand the growing economic, social and psychological impact of computers on individuals, on groups within our society, and on society as a whole.
> * The ability to apply computer skills to information retrieval, communication and problem solving. (p. 27)

According to Grierson (1985), the Illinois-Wisconsin ISACS computer coordinators' report on computer literacy stated that computer literacy is the same as using the computer. Important computer skills for a computer literate person, as identified in this report, include keyboarding, word processing, graphics, database management, problem solving, algorithmic thinking, spreadsheets, utilities and programming.

Some researchers have identified categories for measuring computer skills via survey. According to Kay (1993), there are two major categories for measuring computer skills, which are the construct-based model and the process-centered model. The construct-based measure is based both on content and a criterion test performance of users. In contrast, the process-centered measure is based on actual behaviors and responses of users toward computers.

Although Kay (1993) declared the process-centered model superior to the construct-based measure in the modern age, most assessments are construct-based measures. Specifically, the focus of the majority of the questionnaires included to following:

1. Many dealt with the amount of time spent on the computer, ownership of home computers, and the number of computer-related courses taken (Loyd & Gressard, 1984).

2. Ouestionnaires addressed vocabulary and programming (Lockheed, Nielson, & Stone, 1985).

3. Generally, questionnaires dealt with computer experience and use, programming skills, and ability to use software (Jackson, Clements, & Jones, 1985).

4. The majority addressed computer terminology, language commands, programming, parts of the computer, algorithm, math concepts, and the history of computers (Cheng, Plake, & Stevens, 1985).

5. Many dealt with cognitive attitudes related to programming and hardware (Chapline & Turkle, 1986).

6. Many asked about software knowledge, awareness, programming skills, and perceived control (Kay, 1993).

Since the development of the microcomputer and application software, the trend has been to shift measures from the technological awareness of computers and the ability to program to the inclusion of the ability to use application software. The user-friendly nature of computer

applications has attracted more and more people to use computers without possessing certain abilities such as programming, which formerly prevented a lot of users from undergoing the painful experience of using computers (Kay, 1993). These exciting developments have also caused a debate about whether it is necessary to include all computer-related skills in a specific measure of computer literacy.

Rhodes (1986) noted that it is neither realistic nor necessary to ask every user to possess the entire range of computer skills. Longstreet and Sorant (1985) also have questioned whether it is necessary to know programming skills to benefit from the powerful functions of electronic spreadsheet, word processing, database management and authoring systems. Kay (1993) suggested that, in order to make the measurement of computer skills more efficient and effective, it is necessary to replace the traditional technological or global evaluation by developing different subscales for different users.

The essential issue for today's computer users is no longer how to use computers but how to apply computers, based on personal needs (Kay, 1992). In a study conducted by Leitheiser (1992), the important skills for the respondents were identified by their tasks, environment, and the technology they used. Drawn from the model used by Leitheiser (1992), the important computer skills for life

insurance agents in Taiwan were determined by the agent's work, the business environment, and the functions of computers in this research.

Assessing Computer Skills

Orlikowski and Gash (1994) suggested that one of the major problems of using computers in an organization is the different perceptions about the development, use, and technological changes of computers in the organization among key groups of people. These differences, including underlying assumptions, expectations, and knowledge about the purpose, context, importance, and role of computers among different people, directly affect the design, use, and outcome of computer utilization in the organization (Noble, 1986; Pinch & Bijker, 1987). Typically, the key actors in a computer system have been computer specialists, managers, and users (Pinch & Bijker, 1987), who must not only share their knowledge about computers, but also consider the application of computers in their work and the organization from their own points of view (Orlikowski & Gash, 1994). Different groups are likely to hold different perceptions in terms of their tasks in order to make sense of technological applications. For example, in a study by Orlikowski and Gash (1994), technologists and users held significantly different expectations, performed different actions, and received different consequences in regard to the Notes system, a groupware product from Lotus Development

Corporation. Therefore, it seems appropriate to compare the different perceptions concerning the use of computers among these three key groups of people.

Computer directors/specialists. The computer application or software is developed by computer directors/specialists in the home office. The computer director/manager directs and manages activities of computer systems and the people involved. He/She designs policies, standards, and procedures for computer systems and operations, controls the progress of the work, solves the problems, and ensures achievement of goals. It is also his/her responsibility to deal with end-users to identify needs and quality of service (U.S. Department of Labor, 1991). He/She makes decisions, including short-range, long-range, and strategic decisions (Ferratt, 1992). Therefore, the computer director is the key person who determines the nature of the computer system developed by the life insurance company for agents to use in their work. The attitude, knowledge, and perception of the computer director/specialist is an influential factor for the development and usefulness of the computer system.

The high rate of adoption of computers in organizations does not necessarily mean high profitability benefits. Since computer personnel may not be familiar with the real world outside their offices, uses of computers in many companies are wasteful, inefficient, and ineffective

(Geriach & Kuo, 1991; Joshi, 1991; Katzman, 1993; Turnage, 1990). Computer specialists need to pay more attention to realistic use of computers in users' work, rather than focusing only on advances in technologies (Katzman, 1993; Scofield & Shaw, 1992). Findings of a study conducted by Nelson and Hall (1991) showed that information system personnel frequently lack an understanding of the organization and its environment, including other personnel.

Grudin (1994) stated, "Without a thorough knowledge of users' tasks, it may not be possible to set meaningful usability objectives" (p. 78). The setting of meaningful usability objectives has not occurred successfully in many organizations because of a lack of common vocabulary and understanding of both technical and business issues (Nelson & Hall, 1991). Any computer system design should be developed in consultation with users concerning its usability (Gould, Boies, & Lewis, 1991; Grudin, 1994). It is probably impossible to design an effective computer system without a lot of discussion between users and developers (Nelson & Hall, 1991; Scofield & Shaw, 1992).

Sales managers. In the insurance industry, after the system has been developed, the sales managers in the agencies are called to the home office to study the new system, then go back to the agency to deliver the system to the agents. Usually the sales manager has been a successful salesperson and is in charge of training and motivating

agents to use the system in their work (Honeycutt et al., 1994; Stoltz, Majors, & Soares, 1994). According to the U.S. Department of Labor (1991), the sales manager in a life insurance company is the direct boss of the life insurance agent. He/she impacts upon everything from new recruitment to training to daily activity management.

In Inyang's (1993) study of computer use by the life insurance agent, 56% of agents felt the need for more computer training, and the sales manager was rated as the most effective source of computer related information. Usually, the user's perception of an innovation is directly affected by the attitude, advice, and actions of managers (Chakrabarti, 1974; Leonard-Barton & Deschamps, 1988). So, managers need to acquire a good understanding of computers and their uses in order to encourage their subordinates to use computers and in order to be familiar with problems which could be encountered (Geriach & Kuo, 1991; Joshi, 1991; Turnage, 1990). Cooper and Kleiner (1992) argued that

> although managers need not be skillful in every part of the computer technology used by their subordinates, they must be well versed in the general operations of various software and hardware functions. The skills level must be sophisticated enough to review and monitor employee training programs and materials; to be able to discuss problems and solutions with their workers; and to know when new or updated technology will be cost effective. (p. 24)

Because of the important role managers have with their subordinates, the perception of the managers is often used for evaluating the important skills needed and current

ability of an individual (O'Reilly, 1973; Senger, 1971, Smircich & Chesser, 1981). Therefore, managers also should be included in the process of identifying and evaluating needed skills.

Life insurance agents. Once the computer system has been developed and implemented, the agents can decide whether or not to use the system on the basis of what they have learned and their experience with the new computer system. Orlikowski and Gash (1994) emphasized that "to interact with technology, people have to make sense of it; and in this sense-making process, they develop particular assumptions, expectations, and knowledge of the technology, which then serves to shape subsequent action toward it" (p. 175). So, neither the manager nor the computer specialist should take the acceptance of computers among agents for granted and ignore the sense-making process discussed by Orlikowski and Gash (1994).

Golick (1992) argued that computer users have become accustomed to being forced to work on hardware and software they do not really want. Users should have the right to express their needs, to be involved in the development process, and to choose the best solution for their task instead of passively accepting whatever is delivered (Golick, 1992; Colombo, 1994). The user's involvement is a critical element in the successful development of a computer-based system (Ives & Olson, 1984). End-users ought

to be involved in identifying their needs and problems in their work (Geriach & Kuo, 1991; Joshi, 1991; Scofield & Shaw, 1992; Turnage, 1990). In addition, any computer application provided for users ought to be relatively simple and easy to use, which allows them to become familiar with and solve problems in their jobs without lengthy learning time (Colombo, 1994; Garavan & McCracken, 1993a; Geriach & Kuo, 1991; Joshi, 1991).

According to Bandura's (1978) study, self-reported judgments about proficiency were highly correlated with performance afterward. Therefore, respondents who viewed themselves as doing well on their jobs tended to perform successfully (Weiss & Knight, 1980). Schunk (1989) supported this conclusion and stated that self-reported measurement of skills can be a useful predictor for the respondent's proficiency. Also, some researchers (Azjen, 1988; Pomazal & Jaccard, 1976) have argued that self-reported measures are quite accurate if the content surveyed is not very sensitive. Although a high level of computer use might be a desirable behavior for life insurance agents and contribute to bias from self-reports, the risk of bias may be reduced by the complete anonymity of the respondent. Besides, self report approaches are relatively economical in relation to other approaches and the wide range of the information provided by them. In studies of the individual's need to know and current

ability, self-report approaches are some of the most commonly used methods (Boddie, 1993; Nelson & Hall, 1991; O'Reilly, 1973; Senger, 1971; Smircich & Chesser, 1981).

Tasks of Life Insurance Agents

The salesforce is an important company asset at an average cost of 30% of the total budget (Scofield & Shaw, 1992). Unfortunately, little attention has been paid to the use of computers in sales work (Colombo, 1994; Scofield & Shaw, 1992). Most computerization and related academic study has been focused on industry or company level and operations in the home office rather than at the sales level (Colombo, 1994). However, many journals provide practical examples which show big room for improvement to this area (McColloch, 1992; Messmer, 1993; Vijayan, 1994).

The important computer skills for life insurance agents (the saleforce) must be identified and programs designed to coordinate with their work and help them to achieve business goals, including improving image, professionalism, productivity, and service (Mighty, 1994). These skills can also help solve problems among agents, such as the high turnover rate, the lapse rate, and overpromising (making statements that are too optimistic)(H. M. Lee, 1994).

According to J. P. Mei (personal communication, January 20, 1995), the major tasks of the agent are (a) prospecting (b) sales presentation (c) selling (d) after services (e) administration and (f) learning.

Prospecting

Some authorities have described the relationship between agent and client as being like that of the raw material to finished product. Even the best factory is not able to produce any products without raw material (J. P. Mei, personal communication, January 20, 1995). Prospective customers include both insured clients and new prospects. Creating and maintaining the database of prospects is the first concern of sales (Scofield & Shaw, 1992). Prospect cards record personal data, visiting information, and sales strategies. Many items must be recorded after the initial meeting, to be followed by systematic, periodic updating. A great amount of time is needed to finish this uninteresting daily task. More time is needed for searching, categorizing, and retrieving this information, and also for rewriting these data for reports, proposals, letters, name lists, and mail labels (Colombo, 1994; D. C. Jones, 1993). These tasks become more difficult when cards accumulate (LaPlante, 1994b). Many agents become discouraged, giving up the systematic process, so that they lose this steady source of raw material (customers) with which to make the final product (sales) and earn the anticipated income (J. P. Mei, personal communication, January 20, 1995).

The database management (DBM) system on computers can help the agent overcome this barrier and provide an efficient way to complete miscellaneous details (Jackson,

1993). After data are entered, they can be updated and/or used in many different situations (Senn, 1995). Existing data, such as information about clients or leads, can be retrieved or copied in seconds (Calvin, 1992; Shelly, Cashman, & Waggoner, 1990). A huge quantity of hand work is thus eliminated. The DBM also enables agents to generate the lists for monthly visiting schedules or the target market by means of sorting and indexing. The information about a specific prospect appears on the screen when needed (Campanelli, 1993). Word processing also is a good tool for purposes of correspondence with prospects. Form letters can be formatted and applied to many situations as personal customized correspondence (Norr, 1991). Also, personalized mass business letters to prospective customers can be produced by merging a computer mailing list from the file in a database with form letters. With the needed computer skills, prospect management can be enjoyable work without exhaustive repetition (D. C. Jones, 1993; Stikin, 1994).

Sales Preparation

In order to attract the prospect and use the valuable face-to-face interview effectively, the agent must make sufficient preparation, including a study of information about the prospect and the development of decisions regarding sales strategy and presentation of the appropriate proposal and illustrations (Colombo, 1994; Waisanen, 1993). Due to the complexity of the products, many calculations,

and much consideration and paper work are involved in this process. Many factors need to be considered because of the constantly changing requirements of law, the government, or the company. The details of these influential factors are too numerous and complex to remember. Unexpected mistakes often appear when producing this material manually. Errors can produce many misunderstandings and frustrations among clients, agents, and companies (Milosevich, 1990; Ryan, 1991; Y. Huang, personal communication, January 24, 1995).

Sales preparation not only creates a heavy workload for agents, but also is legally important for the companies. For example, Metropolitan Life lost a great deal of money in a lawsuit filed because the agent misled a group of nurses in buying life insurance, which was described as a retirement plan. Metropolitan Life has paid out millions of dollars in refunds to customers who were sold these retirement savings plans in slick, misleading wrappers that were really whole-life insurance policies by Florida-based agents (Steinmetz, 1994). Since this lawsuit, many big companies, such as Prudential, Metropolitan, New York Life, etc., require their agents to obtain approval from their legal departments before they present any new sales illustrations to clients (Wu, 1994). The National Association of Life Underwriters has also studied ways to prevent abuse of sales illustrations.

The complexity of products and the situation of the prospects add to the burden of the agent's work, but the characteristics of the products and the prospects can be classified in pre-designed models and built into the spreadsheet software. Many complicated calculations then become possible by striking a single key on the computer (Senn, 1995). Except for wrong data entry, agents can now be confident of the proposal or illustration. By combining the function with word processing, customized professional material can be made in minutes (D. C. Jones, 1993). Through examination of the computer program, the company is also able to prevent potential errors.

Furthermore, the problems of lack of professional knowledge and changing requirements for agents can be solved with an expert system which enables the sales force to apply the experts' experience in particular cases without the danger of omitting any important factor in design (Braun, 1992). Agents, companies and customers all benefit.

Selling

Selling is still the most important task for agents (Rajala, 1993), and can be divided into several stages: approaching, presenting, handling objections, and closing (J. P. Mei, personal communication, January 20, 1995). Russell and Black (1993) stressed that each stage involves profound knowledge relating to psychology, consumer behavior, communication, etc. In addition, because of the

invisible, long-term, altruistic, and complex nature of life insurance, it is very difficult to clearly explain the concept in a few minutes (Russell & Black, 1993). This can cause selling failure, or conversely, the prospect might buy without clear understanding (Fang, 1988). Ways to attract interested people, to make insurance easy to understand, and to assist customers in making a decision are challenges for every agent (Ray, 1993). Not every person has natural talents for good organization, communication, and persuasive skills in life insurance presentations. Furthermore, unexpected situations may occur that need attention. When consulting with a prospect, it is possible for agents, especially new agents, to forget the important message or be unable to answer a related question (DeJong, 1992; Frye, 1993a). This might cause them to waste a valuable opportunity or perhaps even to decide to abandon this career.

Virtually anyone can design a good presentation according to his/her own style and customers' strengths if there is enough time to prepare without pressure. Presentation software enables agents to prepare the presentation in advance, make necessary adjustments, and, finally, show systematically the best explanation, screen by screen, without missing important points (Okon, 1993; Schroeder, 1993).

The current development of multimedia makes the traditional presentation more fruitful by involving animation, sound, and video (Okon, 1993). With the assistance of computer presentations, the agent is able to maintain a certain performance level each time, projecting a professional image (Philibert, 1991; Ray, 1993). Customers are impressed and tend to find it easier to make the decision to buy (Frye, 1993a). Moreover, it is possible to have the prospect review the presentation before/after the meeting by the use of disk with his/her own computer, by mail, or through a computer network (Carey, 1992). If the prospect does not have a computer, the presentation can be transferred to a video recorder and the video tape can be shown to the prospect (Carey, 1992). Concerns raised by the prospect during the interview which are not familiar to the agent can be referred to the database on the expert system in the computer (DeBow, 1992; Martino, 1993). Agents also can connect to the home office and retrieve needed information, or ask for the answers from experts via a modem (Frye, 1993b; Johnson, 1989). Ultimately, the insurance application can be sent to the underwriting department and the transaction finished immediately (Reel & Rushmore, 1993). Under certain conditions, the policy can be approved immediately and the commission sent to the agent's account simultaneously. Otherwise, the computer will show what further information is needed for examination via a program

of underwriting simulation (Aartrijk, 1993; Rook, 1991; Steckler, 1994). With related computer skills and company support, today's agents are often able to finish the whole process in one visit, a highly efficient development which would be impossible without the computer (Aartrijk, 1993).

After Sales Servicing

Many agents emphasize selling, which is considered the productive portion, and neglect the after service, which may seem a non-profitable activity (Wu, 1994). As mentioned earlier, poor after service is one of the most serious problems in the life insurance industry in Taiwan, and many avoidable disputes are caused by poor after service (Wu, 1994). In fact, maintaining a commitment to the client is a necessary virtue of agents. It not only wins the agent a good reputation and friendship with clients, but also generates additional or new business from clients or their referrals (Wu, 1994). Unfortunately, accumulating clients makes after service increasingly difficult to handle under the pressure of new business. For example, Christian Yang, who is an outstanding Chinese agent in New York Life, now has 3000 clients after working with the company for eleven years. Without strong support, it would be impossible for her to provide good service for all of her clients (T. L. Liang, 1994). Most after service tasks are trivial matters which don't require a high level of skill, but the details are important and must be performed accurately and quickly.

It is difficult for agents to cover so many details (Wu, 1994).

Computers can compensate for the inadequacies of human memory and help agents keep track of the clients they serve (Bryan, 1993). For instance, many agents set a command on the computer after closing a case which asks the computer to remind him/her to mail a birthday card and reminder card every year (S. J. Lee, 1993). The reminder card is sent out five months after the client's birthday. In addition to the greeting, it reminds the customer that he/she may want to consider additional insurance needs in one month because of the anticipated increases in the premium rate. At the end of a given month, agents can generate the name list and print out the birthday or reminder cards/letters for the next month. The computer prompts greetings and follow-up phone calls at the appropriate time to encourage regular communication with the client (S. J. Lee, 1993; Waugh, 1990). If a faxed letter is appropriate, the computer can be programmed to send greetings or reminders at appropriate times. The content of the greeting or reminder can be changed whenever desired (Negrino, 1993). If the client is also a computer user, greetings and reminders may be sent through E-mail or file transmission by using a modem (Zilber, 1992). Similarly, other tasks such as premium collection, appointment reminders, claim tracking, etc., can also be handled through the same computer skills: database

management, word processing spreadsheet, etc. Moreover, computer and communication technology allow clients to enjoy more of the services offered by the company. (Burger, 1993; Golden, 1994b).

Learning

Lack of professional knowledge is one of the most serious problems of agents in Taiwan. It not only creates a bad image for the industry, but also causes a high turnover rate of agents and a high first-year lapse rate of clients (Wu, 1994). Management, agents and customers are all affected. The only solution is education (Wu, 1994). According to Keating (1989b), on average, life insurance companies spend more than $130,000 to nurture an agent, but there is a 75% turnover of agents in the first three years (Borger, 1988).

The problem and the solution have been known by management for some time, but no change has occurred. The problem stems from a number of factors: (a) There is too much necessary information for the agent to learn in a short period of time. Although some companies spend six months to train a new agent, both agents and companies still feel that more training is needed. (b) The diverse background of trainees, including education, age, previous work experience, and work motivation, make traditional training less effective. (c) There is a lack of qualified instructors who know both insurance and training. The dilemma is that

capable instructors tend to join the sales force because of the greater income available. (d) Time conflicts with sales appointments make agents unable to devote adequate time and, consequently, abandon the course (Rajala, 1993; Tseng, 1995a). Although sales training is very expensive, failure to train sales personnel adequately costs even more in lost productivity (Buchok, 1993; Moad, 1993; Rajala, 1993).

Computer-based training (CBT) frees people from time and space constraints (Holden & Wedman, 1993; Jennings, 1987; Rajala, 1993; Smeltzer & Davey, 1988). Once the computer training program has been developed by generating experts' experience, companies can duplicate it in quantity or distribute it through a modem (Cothran, 1991). All agents in the company can benefit from the program. They no longer have to meet as a group for training. Everyone can choose a subject, level, time and place, depending on his/her own needs (Koco, 1990; Rajala, 1993; Wehr, 1988). The computer encourages the process of self-instruction through its availability in terms of time schedules, repetition, speed, and other individual requirements (Classe, 1994; Sharon, 1989). The training method can be tutorial, drill, or simulation, according to the subject of the training (Lillie, Hannum, & Stuck, 1989). CBT is not merely a computer version of traditional training; the current development of multimedia and interactive technology make it more impressive and effective for trainees (Buchok,

1993; Spitz, 1991). Since it is impossible for trainees to retain all elements of a training course, the program can be reviewed regularly, as needed. For example, after the agent takes a course in financial planning, he/she can review the course before visiting a prospect to discuss the idea of financial planning (Rajala, 1993). The flexibility and availability of CBT enable the agent to study as he wishes and refresh as he/she needs (Rajala, 1993; Spitz, 1991). CBT is one of the best solutions to the training problem in the life insurance industry (Rajala, 1993).

Administration

No matter how productive an agent is, he/she still needs to accomplish the necessary administrative work. And these tedious duties can be the most painful for the experienced agent (D. C. Jones, 1993). Routine tasks such as filling in sales reports, completing various forms, tracking applications, communicating with staff or manager, etc., take a lot of valuable time from sales work, especially if traditional methods are used (Taylor, 1993). After examining the time spent on administrative tasks, Colombo (1994) stated that there is much room for improvement in the areas of task repetition, daily reports, and sales call reports, as well as much time wasted on file searching, application tracking and waiting for replies. Freeing the most productive people in the market from the

heavy load of administration is an important considerations for companies (Colombo, 1994; Potts, 1993).

The computer database enables users to link different files by sharing the same field, and change the data in all related databases simultaneously when the data have been updated in one file (Parkinson, 1994). This eliminates many repeated entries of data, as well as data differences of the same item in various files. Furthermore, duplicate data in different reports or forms can be retrieved from existing files. Much needed information can be recalled immediately, including information in the database of the home office or other organizations, through a modem (Frye, 1993b; Magrath, 1990; Waugh, 1990). All related administrative codes can be installed on hard disks for reference (Jackson, 1993).

The spreadsheet is helpful in generating professional sales reports, including the related graphics (Campanelli, 1993). Especially for routine reports, the use of macro functions may produce a finished document in minutes after the user enters the latest data (Senn, 1995).

Agents also have found communication technology useful in their administrative work. Communication technology with computers, such as E-mail, voice mail, and computer facsimile allow an agent more flexibility in communication tasks (Friesen, 1993). Moreover, calendar management on the computer is an effective means for agents to allocate their valuable time and track various tasks (Bryan, 1993).

Scofield and Shaw (1993) argued that sales people only have 36% of all their time available for selling. In order to enable the agent to be more productive and efficient, the computer and related technologies are essential tools, as shown in the literature.

After examination of the major tasks of life insurance agents, their problems, and the related functions of computers, the important computer skills appear to be (a) basic computer skills, (b) database management, (c) spreadsheet, (d) word processing, (e) communication, (f) presentation, (g) computer-based training and (h) artificial intelligence.

Environment of Life Insurance Agents

The insurance industry is an information-intensive industry, with a demand for computers to process the great amount of information involved in its business (Mighty, 1994). Computers already occupy a central position in insurance companies (Rajan, 1987). In fact, in order to survive in the ever changing market, it is impossible for an insurance company to handle the business without computers (Codington & Wilson, 1994). Consequently, the insurance industry has become one of the most highly computerized industries (Indianer, 1994).

Computer Use in the Life Insurance Industry

W. H. Tsai (1981) stated that the insurance industry is the pioneer in the use of the computer in the workplace.

The Life Office Management Association formed a committee to study the feasibility of computer use in this industry in 1947, only two years later than the introduction of the ENIAC, which was the first real electronic computer. In 1954, Metropolitan Life Insurance Company, the first life insurance company to make use of computers in business, installed the second commercial computer in the world (W. H. Tsai, 1981). There were 146 companies, representing 80% of workers in the life insurance industry, using computers in their work in 1963. Today, the insurance industry remains the largest user of computers. About 25% of the total income of property and casualty insurance companies and 15% of the total income of life insurance companies are spent in computer-related expenses (W. S. Tsai, 1990).

Since computerization in the life insurance industry closely follows the evolution of computers, W. H. Tsai (1981) argues that the history of administrative development in the insurance industry has been directly parallel to the computer development. The model of administration corresponds to the nature of computer capability, including big volume, high speed, and accurate data processing. It is one main reason for the enthusiasm of the life insurance industry in using the newest computer systems and promoting computerization in its companies. The life insurance industry has made relatively full use of the potential of the computer. The life insurance industry is an information

intensive, labor intensive, and capital intensive industry (Yun-Chen Publishing, 1990). The strength of life insurance companies is as follows:

a. The premium and coverage of life insurance policies are dependent upon the calculation of the law of large numbers, mortality, the morbidity rate, the accident frequency rate, etc. Therefore, accurate and fast calculation is a necessity.

b. The period of time from the effective date to the expiration date of a policy is very long. A large quantity of data must be maintained over a period of many years.

c. The volume of data not only involves the number of policies but also the content of a single policy, including name, address, phone numbers, gender, occupation, birthday, heath status, etc. All of these items are essential for the contract.

d. Many employees are needed to process and administer these complex data.

e. Like other monetary organizations, life insurance companies need to effectively use their assets, which are accumulated from the premium collections and return to the policyholder as surplus. Therefore, they must analyze the potential return and risk of investments (Yun-Chen Publishing, 1990).

Scofield and Shaw (1993) stated that, "In the 1990s, it's unusual to find a vast area of corporate business that

has not yet been penetrated by computerization; yet this is the case in the realm of sales" (p. 1). Magrath (1990) supports this statement by saying that although the sales & marketing department cost up to 35% of the total expense of average companies, the salesforce tends to be the last area of most companies to use computers in its work.

This is also the typical situation in the life insurance industry. Very little academic research regarding the use of computers in agents' work has been conducted. Even the most famous insurance organizations, such as the Life Office Management Association (LOMA), and the Life Insurance Marketing and Research Association (LIMRA) in the U.S., and the Insurance Research and Development Center (ISDC) in Taiwan have no related study. Most research in the insurance industry has concentrated on computerization in the home office and does not include computer use in agents' work. Four surveys have been found by the researcher which focus on the impact of computer use in agent work. Two of these relevant studies were conducted in Taiwan, and two in the States.

W. B. Lee (1994), in a study titled: A study of the computerization of life insurance selling in Taiwan, interviewed twelve agents and made a questionnaire survey of 447 agents working for seven companies in the Taipei area. The results showed that 25% of respondents were using portable computers in their work, 55% of them were

considering use of the computer, and only 19% of them were neither using nor planning to use the computer in their work. The major reasons identified that prevented use of computers were expense and inconvenience. The attitude of most agents toward using computers was positive, and male and highly educated groups tended toward more computer use. Users were satisfied with the effect of enhancing efficiency and sales performance, but dissatisfied with the support from their companies and the after service of vendors. Outcomes from both the in-depth interview and the questionnaire survey indicated that computer use helps to improve sales activities and performance.

According to Inyang (1993), the main purposes provided by life insurance companies for the use of computers were to enhance their competitive advantage, professional image, customer service, productivity, and efficiency. Inyang (1993) investigated the relationship between using computers as a point-of-sale aid and productivity in the southern territory of a national life insurance company in the United States. Adoption, implementation, and productivity were the three central variables used in this research. Inyang (1993) stated that the sales forces of most major insurance companies were using lap-top computers. There were significant differences between attitudes of "always-users" and "sometimes-users" regarding the idea that the computer improves professional image, customer service, rate of

closure, selling performance, quality of presentations and quotations, and making transition sales faster and easier. There were also differences in satisfaction with the company-sponsored training (Inyang, 1993).

Respondents used computers more often in selling contracts with a higher face amount (US$5000 or more), according to Inyang (1993). The significant predictors of productivity were (a) changes in weekly commissions, (b) changes in number of policies sold, and (c) use of the computer in big cases. However, these respondents did not associate the use of computers with their productivity. Also, 56% of respondents felt the need for more computer training and rated supervisors as the most important sources of computer information (Inyang, 1993).

C. T. Tsai (1993) conducted a study of "The impact of using note-book computers in the operation of the life insurance industry." He concluded that the major impetus for using the note-book computer lies at the individual level rather than the corporate level. Since there are still some other factors involved, the effect on the whole company is not significant, but using notebook computers did augment agent morale and performance. Specific findings of the study were:

1. The steadily decreasing cost of notebook computers and the aggressive competition in the market have caused the adoption of notebook computers.

2. Small and medium-sized companies, selling more life products, pursuing rapid growth, facing more intense competition and encountering lower predictability of clients' needs, tend to use notebook computers.

3. The use of notebook computers is confined to selling activities.

4. The use of notebook computers is influenced by related training.

5. There are more significant psychological effects than real effects on enhancement of personal performance from using the computer.

6. The more professional agents have a greater tendency to use computers in selling activities.

7. No significant relationship was found between using the computer and agent job satisfaction (C. T. Tsai, 1993).

Love (1987) examined a relatively small home service life insurance company, located in southern Michigan, by administering questionnaires to 78 agents in that company. The results suggested that the primary objective, enhancing productivity by using handheld terminals for data entry at points of sale, was satisfied. The attitude of agents toward computers was positive. However, they did not attribute better work structure and enjoyment to computer utilization. Surprisingly, the group over age 46 showed the most favorable attitude toward computer use, while the group aged 35 to 45 had the least favorable attitude.

In summary, all of the research supports the view that there will be more and wider use of the computer in the insurance industry. People in this industry must use computers to conduct their business and maintain competitiveness since computers are able to improve efficiency, service, productivity, image, and performance. Most people surveyed held a positive attitude toward computers. Despite this, it appears necessary to provide more education for users to enhance their computer skills. The current support from the companies towards more education, however, remains unsatisfactory.

Business Circumstances of Taiwanese Agents

The life insurance industry in Taiwan has experienced tremendous growth years since 1980. The growth rate has been in the double digit range every year. The insured rate, the total number of policies per the population, was 27.21% in 1989, 32.1.96% in 1990, 36.20% in 1991, 41.89% in 1992, 47.45% in 1993, and 55.08% in 1994 (see Table 1). The spread rate, the ratio of life policies in-force to national income, was 95.15% in 1989, 110.02% in 1990, 118.05% in 1991, 130.75% in 1992, 141.71% in 1993, and about 159.84% in 1994 (Taipei Life Insurance Association, 1994).

The number of agents increased faster due to changes in the requirements of the registration system; there were 69,552 agents in 1989, 84,157 in 1990, 85,892 in 1991,

Table 1

Growth of the Taiwanese Life Insurance Industry

Year	Insured rate	Spread rate	No. of Agents	Population per agents
1989	27.21	95.15	69,552	289
1990	32.96	110.02	84,157	242
1991	36.20	118.05	85,892	239
1992	41.89	130.75	90,852	228
1993	47.45	141.71	125,478	167
1994*	55.08	159.84	185,000	114

Note. * The figure for 1994 is estimated.

90,852 in 1992, 125,478 in 1993, and about 185,000 agents in 1994 (see Table 1). Taiwan has not only the second highest population density in the world (only less than Bangladesh), but also has become the most dense country in terms of life insurance agents. This means that, on an average, every agent is only able to sell to a small market of 114 people, including elderly and young people (M. H. Hsu, 1995).

There were only two public life insurance companies in Taiwan before 1962. In 1962 and 1963, the government allowed the formation of six private companies. The life insurance business was controlled by these eight companies until 1986, when the government opened the field to American companies. In 1993, the Taiwanese were again allowed to

start life companies. The government then decided to open the market to the whole world. There are now thirty companies in Taiwan. It is believed that the number of life insurance companies will keep increasing in the near future. This means that Taiwan is dense in the number of companies as well as agents (Taipei Life Insurance Association, 1994).

The work of agents. Agents are the bridge between the company and customers (Yang, 1991), the ones who have the most contacts with clients, prospects, and people in general, and who deliver the life insurance information to the clients (S. P. Chen, 1984). Therefore the image of the company is represented by the agents (Y. H. Hsu, 1994).

Unfortunately, 34.8% of the 125,478 agents in Taiwan were part time in 1993. Every month, around 3,000 agents ask to cancel their registrations in the association and transfer to another company. The ratio of agents to supportive staff is 6.7:1, which is very high compared to the 1.8:1 ratio in Canada. This is the main reason that there are so many so-called orphan and surrendered policies (Wu, 1994). In order to pursue mass business and rapid growth, life insurance companies have not conducted serious selection, training, and management of the salesforce. Many unqualified people enter this profession and sell insurance without prerequisite professional knowledge. The only prospective sales groups for them are relatives, friends, and neighbors. The majority of them leave the company

shortly after they sell policies to these familiar prospects (Chang, 1985; S. P. Chen, 1984).

According to Yang (1991), the major tasks of agents dealing with customers occur:

1. Before the sales: Agents use professional knowledge to help the prospect choose the best policy, depending upon analysis of client financial status and personal strength and determination of insurance needs. Also, the agent explains the content of the policy to the client, including the client's rights and obligations, and helps him/her fill out the application form.

2. During the validity period: Agents consult with the client about policy conservation, including policy loans, alterations, premium collection, extended term insurance, paid-up policies, etc.

3. After the occurrence: Agents help to file the claim and send the settlement to the beneficiary.

Usually, every agent has a quota which must be accomplished every month. Under the pressure of the quota, they become sales-oriented agents. Many agents only introduce clients to a specific product, which is the one that has contributed the most to their performance and commissions. Many clients complain that they have been cheated by the agent, who only concentrated on his own benefits, despite the client's needs and rights (Y. Z. Lee, 1984). This situation causes disputes and misunderstandings

among companies and clients. The major results are low persistency, low sales performance, a high turnover rate, and a bad image for both agent and company (H. Y. Lee, 1983; Luo, 1985).

The consensus of the public is that agents exaggerate in their effort to sell (S. P. Chen, 1984). The public also blames agents in that they only focus on the selling and ignore their responsibility of service to the client afterwards (B. L. Liang, 1985). Agents should keep in mind the model of consumption process, which stresses that the purchasing process begins long before the real action and ends a long time after that action. The agents should pay more attention to the whole process, rather than just concentrating on the buying decision (B. L. Liang, 1985).

Another issue critics often raise is relationship selling, or selling only to people they already know. B. L. Liang (1985) reported that 25.36% of clients surrender the policy because of relationship selling. He asserted that relationship selling itself is not a problem. His survey showed that although 46.7% of policies in Japan were sold by this method, only 5.7% of the lapsed policies were sold on the basis of relationship. Therefore B. L. Liang (1985) concluded that the major problem of surrenders and image is the quality of service instead of the relationship factor. Z. S. Chen (1988) noted that same selling problems occurring in other service industries also take place in the life

insurance industry, such as (a) the intangibility of the product, (b) the inseparability between production and consumption, (c) the heterogeneity of service quality and (d) the perishability of the service.

Life insurance product development in Taiwan has depended upon the business environment, economic development, societal structure, and governmental policy. There have been different periods of life insurance product development in the past years in Taiwan, as below: (a) pure endowment period, (b) endowment period, (c) endowment with term insurance period, (d) multiple benefit insurance period, and (e) diversified insurance period (Y. H. Hsu, 1994; Z. S. Chen, 1988). Y. H. Hsu (1994) argued that in the past three decades the business environment has always been a provider-oriented situation. In current years, following the opening of the market to foreign and local companies, intense competition and the awakening of consumer consciousness, the design of life insurance products has become more customer-oriented.

The products. The strength of life insurance products is not the same as other general products, which prevents the customer from buying a policy on his/her own initiative (B. L. Liang, 1985). The reasons are: (a) Compared to other substantial products, such as houses, food, clothes, etc., the life policy is an invisible product. What the customer gets is merely a contract. (b) The need for

insurance is latent, because most people think that death is very far away, and even avoid talking of it. (c) Some people don't want to buy insurance because the death claim will be paid to a spouse and they cannot enjoy the benefit themselves. (d) Some people think their families still can survive after a misfortune even if they are not insured. Most people know neither the content of insurance coverage, nor are they familiar with the protection services provided by the insurance company (Z. S. Chen, 1988).

In addition to the problems mentioned above, the life insurance industry has integrated many different areas of professional knowledge, such as actuarial mathematics, medical examinations, law, underwriting, claims, etc. All of these are out of the range of knowledge for average people; therefore it is rare for people to buy insurance on their own initiative (Chang, 1985; H. Y. Lee, 1983; Luo, 1985; Yang, 1991). Y. Z. Lee (1984) supported the above beliefs and also emphasized that it is more difficult to talk about death in Chinese society because people may feel offended, especially older people. So, selling life insurance in Taiwan can be much more difficult than selling other products (Y. Z. Lee, 1984).

The customers. According to a study conducted by H. Y. Lee (1983), 89.2% of respondents did not recognize the benefit of life insurance. Some respondents (28.9%) had low or incorrect knowledge of life insurance, while 88.5% of

them had moderate and low or incorrect knowledge of all insurance. Surprisingly, there was no significant difference between the insured group and the non-insured group in terms of knowledge (H. Y. Lee, 1983). Fang (1988) supported these findings in a similar survey, which found percentages of 24.9% and 89.2% respectively.

Only 11.1% of customers went through thoughtful consideration and comparison before buying insurance. This purchase behavior model, known as after-buying, has been common in life insurance sales in Taiwan. The majority (59.2%) of insured respondents felt dissatisfaction after buying the policy. On the other hand, 87.8% of clients would ask for opinions from friends and family members while buying an expensive product, and 75.4% of clients would compare the products with other brands after purchase (H. Y. Lee, 1983). Therefore, it has been important to provide relevant information, especially from those in influential positions, continuously to the client to keep the policy in force (H. Y. Lee, 1983).

The most important information resource for customers was word of mouth (48.9%), including sales representatives, relatives and friends, as well as personal experience and school. Following these are print media (26.1%), including newspapers, books, and magazines; and electronic media (25%), including radio and television (12%). The actual experience played an important role as an information

resource, both for the person involved and the people with whom they associate. Unfortunately, many clients believed that they had been cheated by the company and agent. Because exaggerated promises from the company and agent create unrealistic expectations, poor service and claim disputes cause later dissatisfaction (Y. Z. Lee, 1984). In S. P. Chen's study (1984), three fourths of the respondents with claim experience expressed negative attitudes toward the experience. While 71% of respondents felt negatively about the image of life insurance companies, 88% of them agreed that the problem was caused by the operation of the company (Y. Z. Lee, 1984). Z. S. Chen (1988) supported this conclusion in his study in which 54.6% of respondents who were categorized in "potential buyer in two years but not right now" replied that the bad image of the company prevented them from making the purchase (Y. Z. Lee, 1984). Most people disagree with the operation of life insurance companies and agents; however, most people still affirm the necessity of life insurance (S. P. Chen, 1984).

According to a report from Taipei Life Insurance Association (1994), between 1987 and 1991, 36.31% of new policies, or 38.35% of the coverage, was lapsed in the first year. In a survey conducted by the Insurance Marketing Magazine (Wu, 1994), the reasons cited by the client for cancelling his/her policy were (a) that they had purchased the policy to extend of a favor to the agent because he was

a relative, friend, or neighbor (19.67%), (b) that they received bad after service, that the agent only appeared when collecting premiums after the sales were made (18.03%), (c) that they found a better investment tool (14.75%), (d) that the policy did not fit the current need (14.75%), and (e) that the agent had already left the company (11.48%). Nearly half of these reasons were caused by the solicitor (Wu, 1994).

The image. S. P. Chen (1984) asserted that image is one of the most important factors of life insurance selling in Taiwan. Because of intense competition, latent needs for insurance, worry about claims, and the complex structure of products, image has become the dominant factor in buying insurance. Lack of a positive image has been the cause of over half of the resistance by the public. A Japanese study showed that the company's image was directly correlated to the company's business; the better the image presented to the public, the better the business of the company. Therefore, it is a must for both companies and agents to change the negative image held by the public (S. P. Chen, 1984; Z. S. Chen, 1988; Fang, 1988; H. Y. Lee, 1983; J. Y. Liang, 1986; Lien, 1988; Luo, 1985).

The Future Development of Life Insurance in Taiwan.

Y. H. Hsu (1994) and Fang (1988) claimed that the life insurance market was still in the growing stage, with a big development potential and space. Future trends that they

mentioned included (a) customer-oriented development (b) agent professionalization (c) product diversity (d) marketing channel diversity (including cooperation with banks, security companies, and property/casualty insurance companies (e) information modernization (f) operation globalization and (g) mergers of companies (Y. H. Hsu, 1994). According to a study of the diversity of life insurance products conducted by Tseng (1992), the product most anticipated in the future is the old age annuity, followed by comprehensive insurance, investment insurance, etc. (Y. H. Hsu, 1994). All of these products are more complex than items previously available and invite new challenges for both companies and agents.

The results of a survey conducted by J. Y. Liang (1986) showed that the most effective ways for Taiwanese salespeople to influence their customers were (a) using the power of professional image, (b) emphasizing the strength of the product, and (c) continuing contact with the client. The implication of this study is that the agent who wants to be successful in the future must work on establishing an optimal image in front of people, absorbing the professional knowledge of products and presenting skills, and providing good service before, during, and after sales.

Yang (1991) stated that the attitude of the prospect is a very important factor in the buying process. In order to improve the public attitude toward insurance, companies need

to enhance agents' professional knowledge, service attitude, and sales techniques by implementing systematic training.

In conclusion, the business of life insurance is likely to keep on growing, and the potential of the market remains big. But competition will become more intense. The product will become more complex and must be more diversified to satisfy different levels of customers. More and more demands and attractions will confront the agent. The agent must enhance his image, professionalism, knowledge, services, and efficiency. The skilled use of computers will assist in accomplishing these goals.

Utilization of Computers for Agents

According to Shelly, Cashman and Waggoner (1990), the computer is "an electronic device, operating under the control of instructions stored in its own memory unit that can accept data, process data arithmetically and logically, produce output from the processing, and store the results for future use" (p. 1.3). Data often signifies the raw material, which is useless in that form. Therefore, it is necessary for humans to transform the data into information which is meaningful and useful, like a finished product. Computers are powerful tools that perform the process of transforming data into information through input, processing, output, and storage--the information processing cycle (Senn, 1995). The capability of highly accurate, speedy, and error-free storage accomplishes a given task in

billionths of a second, keeps enormous quantities of data readily available for use, and makes computers a tremendously versatile device in modern society. Mature, advanced computer technology further enhances the reliability of the computer and makes people rely more and more on the computer in their daily lives (Shelly et al., 1990)

Almost all agent work, including prospecting, sales preparation, selling, after services, administration and learning, deals with information. It is impossible for agents to accomplish their work without appropriate information. And, although most raw data is available, efficiently accessing and processing it into meaningful information and presenting it in an understandable way is the biggest challenge for agents (Fuld, 1994; Harper, 1993). This capability is a crucial element in the agents' success and determines the agents' levels of image, service, quality, sales, and income (Jackson, 1993). Fortunately, the nature of the computer and available application software enable agents to effectively carry out these requirements of information processing (Frye, 1993a; Waugh, 1990). Thus, the critical issue remaining is the ability of sales people to use computers.

Important Computer Skills for Agents

Many researchers have argued that in order to effectively utilize computers, users need basic computer

skills such as the fundamental computer hardware and software concept, computer operating knowledge, programming, self-learning ability, etc., (Fary, 1984; Inskeep, 1982; Levin, 1983). Thus, it appears necessary to put basic computer skills in the list of important computer skills for agents.

A lot of studies also included word processing, electronic spreadsheet, database management, and graphic presentation as elements of computer literacy (Grierson, 1985; D. C. Jones, 1993; Reel & Rushmore, 1993; Waugh, 1990). Life insurance agents also need these computer skills in their work.

Heathman and Kleiner (1991) stated that computer-based training was an essential tool for insurance companies to deliver necessary training to agents. It is necessary for agents to have the ability to use computers to acquire needed knowledge and skills.

Ono and Wedemeyer (1994) noted that, "Among the various technologies driving our society, telecommunications technology has perhaps been advancing most dramatically" (p. 289). Friesen (1993) and Waisanen (1993) also mentioned that computer-mediated communication will change the way agents work. It appears appropriate to include using communication technology as an important computer skill.

Rook 1991 claimed that artificial intelligence was more and more widely used in the life insurance industry,

including both home office operations and field force activities. Due to the complexity of the life insurance product, as well as the business environment, it is almost impossible to compete in the market without the help of artificial intelligence systems (May, 1994; Rook, 1991). Using artificial intelligence systems has become a crucial competency for agents now and in the future.

Based on the review of the literature, eight computer skills have been chosen for examination in utilization of computers by agents. These important computer skills include (a) basic skills, (b) database management, (c) spreadsheet, (d) word processing, (e) presentation, (f) communication, (g) computer-based training, and (h) artificial intelligence. Each skill is discussed below.

Basic Skills

Most literature dealing with computer literacy mentioned the knowledge of computers, which includes basic concepts of software and hardware, keyboarding, the operation system, programming, etc. (Fary, 1984; Inskeep, 1982; Levin, 1983). Although advanced computer software makes using computers easier, some basic skills are needed to efficiently use both hardware and software to solve specific problems and to obtain the best outcomes (Jackson et al., 1985). For example, Henricks (1994) argued that weakness in keyboarding often deters people from using the computer and makes them unable to recognize the

strengths and limitations of computers. In a study conducted by Nelson and Hall (1991), most respondents were found to lack general knowledge of computers. According to the 1993 training survey conducted by Training Magazine, basic computer skills training has increased by 31% and become the second most common training for US employees, up from seventh place in 1988 (Froiland, 1993).

Database Management

Database is a collection of data organized in a manner that allows access, retrieval, and use for that data (Anjard, 1994; Jackson, 1993). It allows users to hold various data for many different types of entities and differing relationships among these entities. Nowadays, the data in databases has enlarged from traditional text and numbers to a repository of text, numbers, images, graphics, and voice, depending upon the users' needs, and the database makes these different forms of data available for future use (Fuld, 1994; Waisanen, 1993). The capabilities of databases for users include the abilities to (a) generate data needed for problem solving; (b) collect, store, sort, edit and update data; (c) retrieve and share data; and (d) apply databases (Senn, 1995).

Data creation, sortation, storage and retrieval are very important for agents in their work, as mentioned earlier in the section on agent tasks. Obviously, the wide use of database empowers knowledgeable workers to work

independently, because the database system allows them to collect, store, and retrieve the needed information to make effective decisions (Calvin, 1992; Jackson, 1993; Senn, 1995). With the enhanced power of PCs, database application has experienced an increased use in business (Winchell, 1994). For instance, according to LaPlante (1994b) contact-management and call-reporting are the most popular applications of database management used by salespeople. Siegal (1994) also noted that sales personnel need to use the application to track expenses and schedule appointments.

Spreadsheet Application

Benham, Delaney, and Luzi (1993) defined the spreadsheet, or worksheet, as a table of columns and rows which allows users to organize numerical data electronically. Most people use it as a tool to track revenues, expenses, profits and losses. The electronic spreadsheet not only automates traditional calculation, but also integrates charting, editing and linking features. This integration substantially improves the productivity and effectiveness of users (McCarthy, 1994). The introduction of electronic spreadsheet software encouraged people to start seriously considering the personal computer as a business tool rather than as a toy for hobbyists or games players (Senn, 1995).

The powerful calculative capability of a spreadsheet enables people who need to deal with many numbers to be more

efficient and confident (McCarthy, 1994). Senn (1995) noted that reasons for people to adopt the electronic spreadsheet include: (a) automating record keeping, (b) summarizing data and producing information, (c) performing analysis and simulation, (d) simplifying information and problem solving, (e) improving communication, and (f) enhancing decision-making. Donald Kraft, a senior computer consultant at Kraft & Associates, has argued that most cases he consults show too much manual work which could be done by electronic spreadsheet at a much lower cost in much less time (Senn, 1995).

Although life insurance agents are neither financial personnel nor management, their daily work involves a large quantity of numerical data. When agents develop proposals and comparative tables of competitive products, it involves calculations which are time consuming if produced manually (D. C. Jones, 1993). The use of the spreadsheet program enables agents to reduce time consuming calculations to size and allows them to perform as many calculations or forecast simulations as needed to serve clients (Magrath, 1990)

Word Processing

Word processing is a toolbox for users who need to work with words. It creates and manages text documents and tailors the physical features of those documents. The nature of electronic documents greatly reduces the time required to prepare and produce written documents. Using

word processing programs enables users to concentrate on their strengths and compensate for their weaknesses (Marshall, 1993). For example, the spelling checker permits users to find mispellings and make needed corrections easily, the thesaurus function allows users to look up synonyms for words in a document easily, and a grammar checker provides users an easy way to discover errors of grammar, writing style and sentence structure (Marshall, 1993). These features not only reduce a lot of user time ordinarily spent working on the mechanical aspects of the job, but also significantly enhance user writing performance and assist with confusing punctuation (Senn, 1995). According to a member survey conducted by the Sales Automation Association (SAA) in 1992, word processing was the top computer application for them (Frye, 1993a). D. C. Jones (1989) noted that agents can use pre-designed templates for various documents and letters to facilitate the use of word processing.

Advanced word processing programs also include the function of desktop publishing, which enables users to create and develop professional-looking documents including both text and graphics (M. Jones, 1993). Many complex documents, such as newsletters, marketing literature, sales reports and proposals, which were produced by professional publishing devices in earlier days, can be designed on the personal computer with a word processing program. Also,

composition features, such as the use of columns for text, and layout features, such as WYSIWYG (what you see is what you get), are available for enhancing the effectiveness and efficiency of document creation with significantly less money (Shelly et al., 1990). The agent is able to enhance the marketing communication and image, producing a customized and professional newsletter by himself (Klinghoffer, 1990).

Communication Technology

Accurate data and efficient communication are the most important factors for business success in modern society (Ingrassia, 1994). With the advent of data transmission media, such as a twisted pair wire, coaxial cable, fiber optics, microwaves, and satellites, the computer is not merely a powerful computing device, but also serves as an important piece of communication equipment (Shelly et al., 1990).

Data communication, the transmission of data over a communication channel between one computer and another computer, will continue to have an increasing impact on human life (Ingrassia, 1994). With the amazing developments in communication technology, people are no longer limited to local information resources (Scott, 1994; Winchell, 1994). Personal users of computers usually utilize a modem to convert digital signals into analog signals and send these signals through telephone equipment (Zilber, 1992). They

can quickly and directly connect to another computer anywhere in the world and access the information needed for their work (Zilber, 1992). Or, users can form a network with a series of computers to share information resources (McColloch, 1992). This information can be in the form of text, graphics, animation, sound, video, and combinations of the above items. Every business today has to face the challenge of ways to adapt the technology to improve efficiency and provide a superior product and better service in the competitive marketplace (Shelly et al., 1990). A survey conducted by Electronic Messaging Association (EMA) shows that electronic mail was second only to voice mail as a major means of corporate communications for Fortune 200 companies in 1993 (Thompson, 1994). Data communication is very important to agents who usually work away from the office (Close, 1992; Parkinson, 1994). It allows agents access in sharing a common database with other departments (McColloch, 1992; Smith & Mckeen, 1993) and immediate retrieval of needed information in front of clients immediately (Frye, 1993b). Burger (1993) also claimed that the advancing communication technology will enable agents to provide better services to their clients.

According to Friesen (1993), computer-moderated communication technology has enabled agents to enhance their efficiency ten times compared to five years ago. They can

now compress a whole day's work into one hour with computers.

Presentation Technology

It is very important for agents to share ideas regarding solutions to clients' problems and to see examples of successful sales work by other agents. Many sales are made through successful communication personally or in groups (Bluestone, 1992). Computer presentations have become more and more popular in the sales world because it is much easier and faster to understand an idea if the idea is presented in graphics rather than in written text (Conning, 1994). Graphics presentation is also a great visual aid to support verbal presentation. It may include text, tables, line art, clip art, photographs and business graphics (Leimberg & LeClair, 1987). Computers with presentation software can print out the presentation material, including slides, note pages, handouts and outlines (Senn, 1995). Also, the computer can make an automatic slide show or project the graphic on a screen for a group of people (Philibert, 1991). Recent software also provides drawing, painting, and image editing functions. Furthermore, multimedia technology enables users to involve animation, sound, and video in the presentation, which makes the presentation more attractive to the audience (Schroeder, 1993). By utilizing computer presentation software, users enjoy the benefits of easy update, much less expensive and

more effective communication, and a more professional image (Senn, 1995). Presentation software also simplifies the sales process and makes presentation easier for less experienced producers (D. C. Jones, 1994).

Computer-Based Training

Ladd (1989) argued that customer satisfaction is the crucial factor for business to survive in the age of increasing technology. Thus, it is necessary to consider using computer-based training (CBT) to keep employee skills updated (Heathman & Kleiner, 1991). CBT enables a trainee to develop updated knowledge and skills and high-quality service with less time and money (Meagher, 1989). This is the reason CBT was used as a training tool in 58% of organizations surveyed in Froiland (1993). Heathman and Kleiner (1991) forecast that 75% of US companies with 50 or more employees will use CBT by 1995.

Wehr (1988) emphasized that the developed CBT program allows a trainee to learn anytime, anywhere, any topic, at his/her own pace (Classe, 1994; Jennings, 1987). Also, learners can use a self-assessment testing system to check their own progress (Geber, 1990). Geber (1990) claimed that computers are also good tools to discover individual learning styles and figure out training needs (Sharon, 1989; Spoor,1993). Different from traditional training, the CBT returns the feeling of ownership to the learner (Hodson et al., 1994; Rajala, 1993). Meagher (1989) noted that the

computer is one of the most efficient training tools. Doyle (1991) also claimed that computers will become a training partner for learners.

The development of multimedia and CD-ROM technology has further improved the attraction and availability of training, especially for part-time agents, such as stockbrokers and bank representatives (D. C. Jones, 1994; Livingston, 1992; Okon, 1993; Schroeder, 1993; Spitz, 1991).

Artificial Intelligence

According to Spencer (1993), artificial intelligence (AI) is a group of technologies for developing computer systems capable of simulating human reasoning and sensation. It uses processing of stored knowledge to make decisions which involve judgement and ambiguity. The applications of AI include robots, expert systems, voice recognition, machine translation, and neural networks. Like a human being, AI is also able to perform learning and self-improvement (McDaniel, 1994). Freedman (1993) forecasted that AI applications will be able to automatically run the needed program to help users solve a problem they present. Turban (1993) stated that the expert system is the most popular use of artificial intelligence.

The quality, consistency, and efficiency of decision making can be improved by using the expert system. The findings of a survey conducted by Phillips and Brown (1993) showed that using computers which provide needed skills and

information enable financial consultants to ignore routine tasks and focus on decision-making and problem solving that require professional judgements. Rook (1991) also claimed that the benefits of using expert systems included "(a) increased quality of services (b) increased task throughput (c) reduced cost" (p. 28).

Expert systems are already used by 90% of insurance companies (Debow & Meade, 1991). The roles and value of expert systems are increasing, especially viewed in the context of other technology (Rook, 1991).

Voice and handwriting recognition have enabled agents to overcome unfamiliarity with keyboarding (Doucette, 1990). Handwriting recognition has also allowed the use of electronic signature capture and electronic application submission, which means faster processing and better service (Diefenbacher, 1993; Reel & Rushmore, 1993).

As more complex practices develop, more demands on artificial intelligence will emerge. Turban (1993) believes that more and more companies and professionals will rely on computer systems with intelligence to make decisions and solve problems.

Summary

Due to the rapid development and the impact of computer technology, it appears necessary to be computer literate in order to survive in modern society. Computer literacy is different for different people, depending upon their needs.

Major elements for identifying computer skills are the tasks, the environment, and the utilization of computers by users.

The main tasks of agents are prospecting, sales preparation, selling, after-sales services, administration, and learning. In Taiwan, life insurance agents encounter serious problems, such as intense competition, complex products, poor image, low productivity, a high turnover rate, a high lapse rate, and dissatisfied customers. The environment has forced agents to enhance their image, service, knowledge, professionalism, and efficiency. One way that is achieved is through computer utilization.

The computer is an essential tool for today's agents to accomplish tasks, solve problems, and achieve goals. It is a powerful data processing device, by nature accurate, speedy, and error-free. Based on the agent's tasks, the business environment, and the utilization of computers, the important computer skills appear to be (a) basic computer skills, (b) database management, (c) spreadsheet, (d) word processing, (e) presentation, (f) communication, (g) computer-based training, and (h) artificial intelligence.

Since agents, sales managers, and computer directors/specialists are key actors involved in using the computer in agents' work, each of their opinions should be examined for assessing computer skills of agents.

CHAPTER III

METHODOLOGY

The steps in this study related to methodology included (a) identification of the important computer skills, (b) preparation of the survey instrument, (c) identification of computer experts, (d) validation of the instrument, (e) identification of the population, (f) collection of data, and (g) analysis of data collected. Literature related to research methods, expert interviews, survey methodology, and statistical analysis methods was studied. Following are stages in the study procedure.

Identification of the Important Computer Skills

The first draft of important computer skills for life insurance agents in Taiwan was developed through a review of the literature by the researcher. Thirty specific skills were identified and then divided into the eight categories discussed in last chapter. These categories were basic computer skills, database management, spreadsheet applications, word processing, presentation technology, communication technology, computer-based training, and artificial intelligence.

Six experts were interviewed by the researcher to discuss important computer skills for agents. The list developed from the literature review was shown to the experts and they were asked for their opinions. In-depth discussions followed. After these interviews, the second

draft of skills was developed and nineteen items were added. The second draft was sent to the experts for validation, and slight changes were made, based on their feedback (see Appendix A).

Preparation of the Survey Instrument

Compared to other methods, the survey questionnaire has many advantages, such as (a) it can be used on a group of a large population with lower cost; (b) it is a non-intrusive method, without tension or intimidation, (c) it can minimize bias; and (d) it can be completed in a simple and straightforward manner in less time (McClelland 1994). Fraenkel and Wallen (1993) also noted that the mail survey "allows the researcher to have access to samples that might be hard to reach in person or by telephone." Pinsonneault and Kraemer (1993) examined 122 MIS (Management Information System) surveys and concluded that the most often used method was the mail questionnaire, 77% in their study. In addition, this approach allows participants sufficient time to make thoughtful responses to the questionnaire (Fraenkel & Wallen, 1993).

The questionnaire was developed by using those important computer skills identified by the experts. Two five-point Likert Scales were used to determine the level of current use and perceived importance by respondents. The Likert scale was originally developed by Rensis Likert and is widely used in various kinds of studies (Fraenkel &

Wallen, 1993). It includes a series of evaluative statements which constitute a five-point scale (Parasuraman, 1991). The Likert scale used in this study ranged from one (not any) to five (very high). Besides the eight categories of computer skills, a request for demographic information was also included.

After it was developed, the questionnaire was submitted to the dissertation advisory committee for review and recommendations. In addition, based on the advice of the chair of the dissertation advisory committee, a local computer expert who is also a computer training instructor was asked to further critique the revised questionnaire. Changes were made accordingly and final approval was given. The questionnaire was then translated into Chinese and the translation was verified by Dr. Paul W. F. Chao, who is a bilingual professor on the committee and who has had teaching experience in Taiwan.

Identification of Computer Experts

Martino (1993) noted that, if there is no existing information, and the external factors, such as technological development, are hard to control, an expert opinion is always needed. Thus, in order to appropriately identify important computer skills for life insurance agents, it was critical to have input from experts. Experts for this study not only needed expertise in computer technology but also familiarity with the business of life insurance agents. Six

computer experts in Taiwan were selected, based on the above qualifications, by recommendations from the Life Underwriters Association, the General Agents and Managers Association, and the Taipei Life Insurance Association in Taiwan.

Two experts selected were in charge of computer system development for agents in their companies. Two experts were representatives of sales managers. The other two experts, who represented the Taiwanese life insurance agents, were computer specialists who had worked in computer companies for a long time and then had become agents and who continued developing programs for agents as well.

Validation of the Instrument

Fowler (1984) asserted that "Every questionnaire should be pretested, no matter how skilled the researcher. Virtually every questionnaire could be changed in some way to make it easier for respondents and interviewees to meet the researcher's objectives" (p. 103). The best method for pretesting a self-administered questionnaire is discussing it with respondents face-to-face after they fill out the pretest questionnaire (Fowler, 1984). Usually the pilot test involves five to ten people (Wiersma, 1991). The questionnaire for this study first was sent to computer experts for validation. In addition, 10 individuals from the target population were randomly selected to complete the questionnaire, including 1 computer specialist, 3 sales

managers, and 6 agents. Questionnaires were completed at the office of the Life Underwriter Association in Taipei. The participants were asked to answer the entire questionnaire and review each item carefully. A group discussion was held to gather comments and suggestions about content, clarity, appropriateness, and format after they finished the questionnaire. No structural problem was found, but some wording changes were made.

According to the policy of the Graduate College at the University of Northern Iowa, authorization to conduct research involving human subjects had to be obtained before the survey instrument was sent to the potential respondents. The permission to carry out the research was granted by the office of the Dean of the Graduate College at the University of Northern Iowa on February 10, 1995 (see Appendix B).

Identification of the Population

This study included three population groups. The groups consisted of (a) members of the Life Underwriters Association, (b) members of the General Agents and Managers Association, and (c) computer directors of member companies of the Taipei Life Insurance Association in Taiwan in 1994.

The first group was drawn from members of the Life Underwriters Association. There are over 185,000 life insurance agents in Taiwan who have passed the professional examination and are registered in the Taipei Life Insurance Association. No formal and representative organization was

formed for this group until May, 1994, when the Life Underwriter Association was established. There are already three thousand members of this organization, and the number is increasing. The four hundred surveyed agents were randomly selected from members of this association by using a random number table.

The second group was drawn from members of the General Agents and Managers Association. This association was formed in 1994, and was the first organization of life insurance sales managers. Over five hundred managers have joined this association. Two hundred members of the association were randomly selected to respond to this survey by using a random number table.

The third group consisted of computer directors of member companies of the Taipei Life Insurance Association. There were thirty life insurance companies in Taiwan in 1995, all of whom were members of the Taipei Life Insurance Association. Each company had a computer department to develop the computer system in the company. This study surveyed the computer director of each company.

Collection of the Data

Once the questionnaire was approved by the dissertation advisory committee, the first wave of mailings was sent on February 13. This included a cover letter (see Appendix C), a survey instrument (see Appendix D), and a self-addressed stamped envelope. The survey cover letter identified the

purpose of the study and the use of the study, and made a statement on the confidentiality of individual responses, and expressed appreciation in advance for response to the survey instrument.

According to Fraenkel and Wallen (1993), one of the biggest disadvantages of the mail survey is the low response rate; therefore, a follow-up call and mailing were used to ensure the needed rate of response. The first follow-up call began February 27, 1995, and the second mailing was sent accordingly. The second follow-up call was initiated March 13, and the third mailing was sent afterward. The survey was completed on March 27, 1995.

There were 241 instruments from the agent group, 134 instruments from the sales manager group, and 22 instruments from the computer directors that were returned by March 27. The return rates were 60.4% for the agents group, 67% for the sales manager group and 73.3% for the computer director group.

A low return rate is often considered as the most important problem of the questionnaire research (Fraenkel & Wallen, 1993; Yang, Wen, Wu, & Lee, 1989). However, according to the standard for the mail survey, which established by Babbie (1973), a 50% or more response rate is sufficient for valid data analysis. Yang et al. (1989) argued that a more than 50% return rate is good enough in Taiwan because normally the return rate is around 30%, and

sometimes even as low as 10%. Therefore, the return rate was considered acceptable for this study.

Analysis of the Data

After the data were collected, they were entered into a computer file, and statistical analyses of the data were conducted by using the Statistical Package for the Social Sciences (SPSS).

A frequency distribution was used for analysis of demographic information from the three groups (agents, sales managers, and computer directors). Each item on each scale was added to produce a mean score on the importance of computer skill items and a score of the current level of the computer skill items for each topic. In order to detect the existence of differences of perceptions among the three groups, three ANOVAS were conducted. One ANOVA was performed on the mean scores for current level of computer skills of the agents, as rated by agents, sales managers, and computer directors. Another ANOVA was done on the mean scores for the importance of computer skills. Also, an ANOVA was used to compare ratings for each item on each scale by each of the three groups. Finally, the Fisher's Least Significant Difference Procedure (three *t* tests at the .01 level) was used for all significant ANOVAs found in previous stages to identify the significant differences between each two groups.

CHAPTER IV

ANALYSIS OF THE DATA

The findings relevant to answering the research questions are reported and analyzed in this chapter. In order to facilitate the presentation of the findings in this study, there are seven sections. The first section describes the profile of the respondents. The second section reports the demographic information about the respondents in the three different groups, which includes gender, age, education, years on the job, company type, etc. The third section identifies the important computer skills for agents. The fourth section reveals the level of importance perceived by agents, sales managers, and computer directors. The fifth section presents the statistical differences among their perceptions. The sixth section displays the level of current use perceived by the three groups. Finally, an explanation of the differences among the three groups in perceptions of the level of current expertise of agents was offered.

Description of Responses

The initial mailing consisted of 630 questionnaires sent to the subjects of this study, including 400 agents, 200 sales managers and 30 computer directors in the Taiwanese life insurance industry. Initially, instruments were received from 168 of the subjects surveyed, which was

26.8% of the sample: 89 responses from the agents, 65 from sales managers, and 14 from computer directors.

A follow-up letter was mailed two weeks after the initial mailing to subjects who had not responded or who had returned an unanswered questionnaire. A follow-up phone call was also made accordingly. Another 159 subjects responded to the follow-up, consisting of 108 agents, 46 sales managers, and 5 computer directors.

In order to reach the preset return rate goal (50%), a second follow-up letter was mailed to people who failed to respond to the initial and first follow-up mailing. An additional 70 questionnaires were returned, including 44 from agents, 23 from sales managers, and 3 from computer directors.

The total number of returned questionnaires was 397, consisting of 241 agents, 134 sales managers, and 22 computer directors. Unfortunately, 49 responses were unusable for data analysis due to missing values on too many questions. Consequently, the total number of usable questionnaires was 348, or 55.24% of the total sample. The distribution of the respondents has been summarized in Table 2.

Demographic Information

The demographic data of participants in the three groups included (a) gender, (b) age, (c) education, (d) years on the job, and (e) company type. In addition,

Table 2

Response Rates

Group	Agent	Sales Manager	Computer Director	Total
Initial mailing (2/13)	400	200	30	630
Initial responses	89	65	14	168
1st follow-up (2/27)	311	135	16	462
1st responses	108	46	5	159
2nd follow-up (3/13)	203	89	11	303
2nd responses	44	23	3	70
Total responses (3/27)	241	134	22	397
Response rates(%)	60.4%	67.0%	73.3%	63.0%
Unusable responses	36	12	1	49
Usable responses	205	122	21	348
Usable rate(%)	51.3%	61.0%	70.0%	55.2%

Note. () indicates the dates of mailing.

questions were asked related to the agent's (a) computer use, (b) frequency of use, (c) major geographical business areas, and (d) average production in terms of policy numbers per month.

Gender

The gender distribution of the three groups is shown in Table 3. The majority of sales managers (65.83%) and computer directors (76.19%) surveyed were male, but the majority of agents (62.44%) surveyed were female.

Table 3

Gender Distribution of Respondents

Gender	Agent		Sales Manager		Computer Director		Total	
	No.	%	No.	%	No.	%	No.	%
Male	77	37.6	79	65.8	16	76.2	172	49.7
Female	128	62.4	41	34.2	5	23.8	174	50.3
Total*	205	100	120	100	21	100	346	100

Note. * There were two missing values in responses.

Age

Of the 348 usable responses, 7.47% of respondents were under 26 years old, 46.26% were between 26 and 35 years old, 42.53% were between 36 and 45 years old, 3.74% were between 46 and 55 years old, and none of subjects surveyed was over 55 years old. Detailed information regarding the age distribution of each group has been listed in Table 4. It shows that the mean age of computer directors surveyed was higher than the mean age of sales managers. It also shows, that the sales managers surveyed were generally older than agents surveyed.

Education

Table 5 displays the level of education for the three different groups. The majority of computer directors

(76.19%) were college or university educated. Only 11.22% of the agents and 26.23% of the sales managers were college

Table 4

Age Distribution of Respondents

Age	Agent		Sales Manager		Computer Director		Total	
	No.	%	No.	%	No.	%	No.	%
Under 25	25	12.2	1	0.8	0	0	26	7.5
26 - 35	101	49.3	53	43.4	7	33.3	161	46.3
36 - 45	76	37.1	60	49.2	12	57.1	148	42.5
46 - 55	3	1.5	8	6.6	2	9.5	13	3.7
Above 55	0	0	0	0	0	0	0	0
Total	205	100	122	100	21	100	348	100

educated. The majority of agents and sales managers had earned high school or junior college degrees. The educational level of the computer director tended to be higher than that of the sales manager, and that of the sales manager tended to be higher than that of the agent.

Years on the Job

In general, computer directors surveyed had more years on the job than surveyed sales managers, and sales managers had more years on the job than agents. Most computer directors (66.67%) had more than five years on the job. The majority of surveyed sales managers (83.34%) were on the job

more than three years. In contrast, most agents (56.28%) had less than three years on the job. The number of years on the job for the three groups is presented in Table 6.

Table 5

Education Level of Respondents

Education Level	Agent		Sales Manager		Computer Director		Total	
	No.	%	No.	%	No.	%	No.	%
Junior high school	17	8.3	2	1.7	0	0	19	5.5
High school	100	48.8	44	36.1	0	0	144	41.4
Junior college	62	30.2	38	31.2	2	9.5	102	29.3
College or university	23	11.2	32	26.2	16	76.2	71	20.4
Graduate school	3	1.5	6	4.9	3	14.3	12	3.5
Total	205	100	122	100	21	100	348	100

Company Type

The distribution of company type for computer directors surveyed was quite similar, from old domestic companies (established before 1963), American companies (established after 1987 in Taiwan), and new domestic companies (established after 1993). The majority of responding agents (66.8%) and sales managers (55.8%) worked for old domestic

companies. The majority of the computer directors surveyed were from American companies (38.1%), closely followed by old domestic companies (33.3%) (see Table 7).

Table 6

Years on the Job of Respondents

Years on the job	Agent		Sales Manager		Computer Director		Total	
	No.	%	No.	%	No.	%	No.	%
Less than 1 years	34	17.1	1	0.8	0	0	35	10.3
1 to 3 years	76	38.2	19	15.8	3	14.3	99	29.1
More than 3 to 5 years	36	18.1	36	30.0	4	19.1	76	22.4
More than 5 to 10 years	47	23.6	38	31.7	6	28.6	90	26.5
More than 10 years	6	3.0	26	21.7	8	38.1	40	11.5
Total*	199	100	120	100	21	100	340	100

Note. * There were eight missing values in responses.

Computer Sharing

Only 32.7% of surveyed agents individually owned and used a computer. Most of the agents surveyed shared the use of their computers with their agency members (38.2%), team members (17.3%) or families (5.9%). The findings related to computer sharing are shown in Table 8.

Table 7

Company Type of Respondents

Company style	Agent		Sales Manager		Computer Director		Total	
	No.	%	No.	%	No.	%	No.	%
Old domestic company	137	66.8	67	55.8	7	33.3	211	60.1
American company	50	24.4	38	31.7	8	38.1	96	27.8
New domestic company	18	8.8	15	12.5	6	28.6	39	11.3
Total*	205	100	120	100	21	100	346	100

Note. * There were two missing values in responses.

Table 8

Computer Sharing

Sharing Situation	Number	Percentage
Individually own & use	66	32.7
Sharing with families	12	5.9
Sharing with team members	35	17.3
Sharing with agency members	77	38.2
Not at all	12	5.9
Total*	202	100

Note. * There were three missing values in responses.

Table 9

The Frequency of Using Computers

Using Computer Situation	Number	Percentage
More than twice per day	74	36.6
More than twice per week to twice per day	29	14.4
More than once per week to twice per week	51	25.3
More than once per month to once per week	25	12.4
Once per month or less	23	11.4
Total*	202	100

Note. * There were three missing values in responses.

The Frequency of Using Computers

Of agents surveyed, 36.6% used computers more than twice every day. Nearly half (49.02%) of the agents surveyed used computers less than twice a week. Findingsrelated to frequency of computer use are shown in Table 9.

Major Geographical Business Area

The geographical area in which most surveyed agents worked was a metropolitan area (63.4%). On the other hand,the smallest numbers of surveyed agents (13.4%) were working in suburban or rural areas. The findings related to geographical business area are shown in Table 10.

The Average Monthly Production of Policies

Most surveyed agents produced 1.1 to 3.0 policies every month (see Table 11). However, more than 40% of surveyed agents produced more than 3 policies per month. Table 11 shows the average monthly production distribution of agents surveyed.

Table 10

The Major Geographical Business Area

Geographical area	Number	Percentage
Metropolitan area	128	63.4
Urban area (except top 5 cities)	47	23.3
Suburban or rural area	27	13.4
Total*	202	100

Note. * There are three missing values in responses.

Important Computer Skills for Life Insurance Agents in Taiwan

Based on a review of the literature and expert opinion, 49 important computer skills were identified for life insurance agents in Taiwan (see Appendix A). These 49 skills were placed in eight categories, including (a) basic computer skills, (b) database management, (c) spreadsheet application, (d) word processing, (e) presentation technology, (f) communication technology, (g) computer-based

Table 11

Average Monthly Production of Agents

Average monthly production	Number	Percentage
Less than 1 policy	17	8.4
1.1 - 3.0 policies	103	51.0
3.1 - 5.0 policies	59	28.2
5.1 - 8.0 policies	20	9.9
More than 8.0 policies	3	1.5
Total*	202	100

Note. * There are three missing values in responses.

training, and (h) artificial intelligence. These specific skills and categories are shown in the survey in Appendix C.

Level of Importance of Identified Computer Skills

Computer skills were rated on a 5 point Likert Scale, with 1 being not important, 2 being of low importance, 3 being moderately important, 4 being fairly high in importance, and 5 being of very high importance. The findings related to levels of importance of identified computer skills are presented below.

Agents

The grand mean for the importance of computer skills as rated by agents surveyed was 3.29 (see Table 12). The mostimportant categories were found to be database management (M = 3.54), word processing (M = 3.47), and

Table 12

Overall Mean Value of Respnses Among Three Groups

Group	Importance level	Present Expertise
Agents	3.29	2.38
Sales managers	3.71	2.60
Computer directors	3.59	2.35
Overall	3.46	2.46

Note. Scale value from 1 = not any to 5 = very high.

spreadsheet applications (M = 3.35). The least important were communication technology (M = 3.05), computer-based training (M = 3.16), and basic computer skills (M = 3.20), as shown in Table 13. The most important computer skills were identified as sorting and displaying specific information from databases (M = 3.70), customized proposals (M = 3.66), designing, and displaying databases (M = 3.61). The least important computer skills were voice mail (M = 2.89), programming (M = 2.93), and using an automatic presentation program (M = 2.97), as shown in Appendix E. There is a .81 difference between the high (M = 3.70) and low (M = 2.89) means for importance levels of computer skills.

Sales Managers

The grand mean for the importance of computer skills as rated by sales managers surveyed was 3.71 (see Table 12).

Table 13

Ranking of Importance Levels of Skills Categories by Agents

Ranking	Categories of computer skills	Mean
1	Database applications	3.54
2	Word processing	3.47
3	Spreadsheet applications	3.35
4	Artificial intelligence	3.34
5	Presentastion technology	3.24
6	Basic computer skills	3.20
7	Computer-based training	3.16
8	Communication technology	3.05
	Average (agents)	3.29

Note. Scale value from 1 = not any to 5 = very high.

The highest ranked categories were database management (M = 4.11), word processing (M = 4.02), and spreadsheet applications (M = 3.81). The least important were communication technology (3.44), computer-based training (M = 3.47), and basic computer skills (M = 3.47), as shown in Table 14. The most important computer skills were sorting and displaying specific information from databases (M = 4.34), designing and displaying databases (4.16), and formatting documents (M = 4.16). The least important computer skills were computer games (M = 3.02), hardware maintenance and troubleshooting (M = 3.09), and distance

learning (M = 3.15), as shown in Appendix E. There is a 1.32 difference between the high (M = 3.70) and low (M = 2.93) means for importance levels of computer skills.

Table 14

Ranking of Importance Levels of Computer Skills Categories by Sales Managers

Ranking	Categories of computer skills	Mean
1	Database applications	4.11
2	Word processing	4.02
3	Spreadsheet applications	3.81
4	Presentation technology	3.80
5	Artificial intelligence	3.57
6	Basic computer skills	3.47
7	Computer-based training	3.47
8	Communication technology	3.44
	Average (sales managers)	3.71

Note. Scale value from 1 = not any to 5 = very high.

Computer Directors

The grand mean for the importance of computer skills as rated by computer directors surveyed was 3.59 (see Table 12). The highest ranked categories were word processing (M = 3.95), presentation technology (M = 3.71), and computer-based training (M = 3.71), as shown in Table 15. The least important skills, as rated by computer directors, were found

to be basic computer skills (M = 3.02), spreadsheet applications (M = 3.48), and communication technology (M =3.49). The most important computer skills were identified as underwriting feasibility (M = 4.29), formatting documents (M = 4.20), and administrative processing (M = 4.19). The least important computer skills were programming (M = 2.33), writing macros (M = 2.40), and use of operating systems for personal computers (M = 2.62), as shown in Appendix E. There is a 1.84 difference between the high (M = 4.29) and low (M = 2.33) means for importance levels of computer skills.

Table 15

Ranking of Importance Levels of Computer Skills Categories by Computer Directors

Ranking	Categories of computer skills	Mean
1	Word processing	3.95
2	Computer-based training	3.71
3	Presentation technology	3.71
4	Artificial intelligence	3.67
5	Database applications	3.66
6	Communication technology	3.49
7	Spreadsheet applications	3.48
8	Basic computer skills	3.02
	Average (computer directors)	3.59

Note. Scale value from 1 = not any to 5 = very high.

Differences in Importance Level

One way in which Analysis of Variance (ANOVA) was used initially was to analyze ratings of importance and level of expertise for each computer skill, as identified by each of the three groups. Using the ANOVA, 33 significant differences were found among the three groups at the .05 level. The Fisher's Least Significant Difference Procedure (three t tests at the .01 level) was then used. This procedure is a test which can determine if differences exist between any two groups when making comparisons among three groups. Using this test, 36 significant differences between groups were identified. However, because of the difference in sample sizes, this finding should be interpreted with caution.

The most significant differences were found between agents and sales managers, as shown in Appendix F. From a total of 49 skills, 28 items were significantly different. Every item in the categories of database management and presentation technology showed significant differences. Four items in the categories of spreadsheet application, word processing, and communication technology were significantly different. Two significant differences were found in the categories of basic computer skills and computer-based training, and one in artificial intelligence.

In the comparison of ratings by surveyed computer directors and sales managers, three items in basic computer

skills and one item in the category of artificial intelligence had significant differences (see Appendix F).

Only four significant differences were found when comparing responses on importance levels by computer directors and agents. The categories of basic computer skills, communication technology, computer-based training, and artificial intelligence each had one item that was significantly different. Three of the four items that were significantly different were rated higher by computer directors, and were all related to adiminstrative affairs (see Appendix F).

Present Level of Agent Expertise

Present levels of agent expertise, regarding identified computer skills, were rated by life insurance agents, sales managers, and computer directors. The findings for each group were presented separately.

Agents

The grand mean for the level of agent expertise with computers, as rated by agents, was 2.38 (see Table 12). The highest rated categories based on mean values were database management (M = 2.71), word processing (M = 2.71), and basic computer skills (M = 2.67). The lowest rated categories included communication technology (M = 1.96), presentation technology (M = 2.08), and computer-based training (M = 2.12), as shown in Table 16.

The highest levels of agent expertise, as rated by agents, were in the areas of keyboarding and data entry (M =3.13), sorting and displaying specific information from database (M = 2.93), and understanding basic concepts of computer software (M = 2.93). The lowest levels of agent expertise in the area of important computer skills were voice mail (M = 1.81), expert consulting systems (M = 1.83), and distance learning (M = 1.91), as shown in Appendix G. There was a .32 difference between the highest (M = 3.13) and lowest (M = 1.81) means regarding agent expertise.

Table 16

Ranking of Present Levels of Agent Expertise by Agents

Ranking	Categories of computer skills	Mean
1	Database applications	2.71
2	Word processing	2.71
3	Basic computer skills	2.67
4	Spreadsheet applications	2.55
5	Artificial intelligence	2.29
6	Computer-based training	1.12
7	Presentation technology	2.08
8	Communication technology	1.96
	Average (agents)	2.38

Note. Scale value from 1 = not any to 5 = very high.

Sales Managers

The grand mean for the level of agent expertise with computers as indicated by sales managers was 2.60 (see Table 12). The highest rated categories as perceived by sales managers were word processing (M = 3.11), database management (M = 3.07), and spreadsheet applications (M = 2.87). The lowest rated categories of agent expertise in important computer skills were communication technology (M = 2.09), computer-based training (M = 2.24), and artificial intelligence (M = 2.32), as shown in Table 17.

Table 17

Ranking of Present Levels of Agent Expertise by Sales Managers

Ranking	Categories of computer skills	Mean
1	Word processing	3.11
2	Database applications	3.07
3	Spreadsheet applications	2.87
4	Basic computer skills	2.71
5	Presentation technology	2.42
6	Artificial intelligence	2.32
7	Computer-based training	2.24
8	Communication technology	2.09
	Average (sales managers)	2.60

Note. Scale value from 1 = not any to 5 = very high.

Sales managers identified the highest levels of agent expertise in important computer skills as formatting documents (M = 3.48), sorting and displaying specific information from databases (M = 3.33), and creating and editing documents (M = 3.21). The lowest perceived levels of agent expertise in important computer skills were distance learning (M = 1.84), voice mail (M = 1.91), and voice and handwriting recognition (M = 1.91), as shown in Appendix G. There is a 1.57 difference between highest (M = 3.48) and lowest (M = 1.84) means for computer skills.

Computer Directors

The grand mean for present level of agent expertise in identified computer skills, as indicated by computer directors was 2.35 (see Table 12).

The highest rated expertise in important computer skills categories were word processing (M = 2.82), spreadsheet applications (M = 2.54), and database management (M = 2.48). The lowest were communication technology (M = 1.99), computer-based training (M = 2.12), and artificial intelligence (M = 2.14), as shown in Table 18.

The highest levels of agent expertise as rated by computer directors in important computer skills were keyboarding and data entry (M = 3.24), formatting documents (M = 3.20), and creating and editing documents (M = 2.95). The lowest levels of agent expertise in important computer skills, as rated by computer directors were found to be

distance learning (M = 1.71), accessing databases through computer networks or modems (M = 1.80), and expert consulting systems (M = 1.80), as shown in Appendix G. There was a 1.53 difference between the highest (M = 3.24) and lowest (M = 1.71) means for agent expertise, as rated by computer directors.

Differences in Perceptions Level of Agent Expertise

A one way ANOVA was used to initially compare ratings of level and expertise for each computer skill identified by each of the three groups. Using the ANOVA, eight

Table 18

Ranking of Present Levels of Agent Expertise by Computer Directors

Ranking	Categories of computer skills	Mean
1	Word processing	2.82
2	Spreadsheet applications	2.54
3	Database applications	2.48
4	Basic computer skills	2.43
5	Presentation technology	2.29
6	Artificial intelligence	2.14
7	Computer-based training	1.12
8	Communication technology	1.99
	Average (computer directors)	2.35

Note. Scale value from 1 = not any to 5 = very high.

significant differences were found among the three groups at the .05 level (see Appendix H). Nine significant differences between two groups were identified by using Fisher's Least Significant Difference Procedure (three t-tests at the .01 level). However, because of the difference in sample sizes, this finding should be interpreted with caution.

Eight significant differences were found between agents and sales managers, regarding their perceptions of agent expertise. Three of the significant differences occurred in the category of word processing applications, two in the categories of database applications and presentation technology, and one in the category of spreadsheet applications (see Appendix H).

Only one computer skill, sorting specific information in a database, was determined to be significantly different when examining the difference between groups of sales managers and computer directors. No significant differences were found between groups of agents and computer directors. Appendix H shows the results of the comparisons.

CHAPTER FIVE

SUMMARY, CONCLUSIONS DISCUSSION, AND RECOMMENDATIONS

The analysis of data collected from members of the Life Underwriters Association, the General Agents and Managers Association, and computer directors of life insurance companies in Taiwan provided the basis for the following summary, conclusions, discussion and recommendations.

Summary

The general focus of this study was to identify important computer skills for life insurance agents in Taiwan, and compare the perceptions of computer directors, sales managers, and agents regarding the importance of these skills, as well as the present level of computer expertise of agents. To accomplish the purpose of this study, the following research questions were developed to guide the study:

1. What are the important computer skills for life insurance agents in Taiwan?

2. What is the level of importance of computer skills for life insurance agents, as identified by life insurance agents, sales managers, and computer directors?

3. Do differences in perception exist among life insurance agents, sales managers, and computer directors, concerning the importance of computer skills?

4. What is the present level of agent expertise regarding identified computer skills, as rated by life insurance agents, sales managers, and computer directors?

5. Do differences in perception exist among life insurance agents, sale managers, and computer directors, concerning the present level of agent computer expertise?

Eight important categories of computer skills were identified after a review of the related literature and examination of the tasks and business environment of Taiwanese life insurance agents and the utilization of computer technology. These included basic computer skills, database management, spreadsheet applications, word processing, communication technology, presentation technology, and artificial intelligence. There were 49 computer skill items within the eight categories, as shown in Appendix A, which were developed and validated by selected experts in Taiwan. The survey instrument, shown in Appendix D, was developed accordingly.

The population of this study was limited to members of the Life Underwriters Association, the General Agents and Managers Association, and computer directors of life insurance companies in Taiwan. Forty-nine questionnaire items were used in the survey; each item included two Likert Scales for the level of importance and the level of agent expertise. Nine additional items were used to generate demographic information. There were 397 (63.02%) responses

out of a total of 630 subjects. Because of 49 unanswered or improperly answered questionnaires, the number of usable responses for this study was 348 (55.24%).

The mean response value for data collected was used to determine the importance level and current expertise level for each computer skill. ANOVAs were used to detect perceptual differences among the three investigated groups. In addition, Fisher's "Least Significant Difference" procedure was used to identify the significant differences from the results of the ANOVAs. The statistical analysis was made by using the Statistical Package for the Social Sciences (SPSS).

Most subjects surveyed were 26-45 years old (88.8%). Majorities of both agents (79.0%) and sales managers (67.2%) were high school or junior college educated. Also, majorities of both agents (66.8) and sales managers (55.8%) worked for old domestic companies. Only the majority of computer directors were university educated (76.19%) and working for American companies (38.10%). A majority of both sales managers (65.83%) and computer directors (76.19%) were male; only 62.44% of agents surveyed were female. On average, computer directors were older, more highly educated, and had more years on their jobs than did sales managers; and sales managers were older, more highly educated, and had more years on the job than did agents.

In addition, the majority of agents surveyed: (a) did not individually own and use computers (67.33%), (b) used computers at least once every week (76.24%), (c) were concentrated in the metropolitan market (63.37%), and (d) produced 1.1 to 3.0 policies every month (50.99%).

Conclusions

Based on the statistical analysis of data in the previous chapter, the following conclusions were formulated.

1. The most important categories of computer skills, as identified by agents and sales managers were database management, followed by word processing and spreadsheet application. These findings are supported by many related reports (D. C. Jones, 1993; Pomeroy, 1990; Waugh, 1990).

Furthermore, the most important computer skills identified by agents and sales managers, those which had ratings higher than the grand mean value (see Appendix E) include sorting specific information, creating customized proposals, designing databases, guiding sales activities, relating databases, formatting documents, self-diagnosis analysis, merging mail, etc. All of these computer skills are directly related to agents' daily tasks. Those findings also support the notion that identifying computer skills should be based on personal needs (Kay, 1992) or user tasks (Leitheiser, 1992).

2. It was interesting to note that the least important categories of computer skills, as identified by agents and

sales managers, were communication technology, basic computer skills, and computer-based training. The bottom ten computer skills, as identified by agents and sales managers, were voice mail, automatic presentation programs, distance learning, electronic mail, use of projection devices, access to databases via modem, computer facsimile, voice and handwriting recognition, electronic mail, etc. Since the lowest rated categories and skills are rarely used by agents and seldom available in Taiwan, the findings support Leitheiser's (1992) argument that the users' environment and the technology they use are critical elements in the identification of important computer skills. On the other hand, the second lowest category rated by the three groups was basic computer skills. This may indicate that basic computer skills are not as important as they were in the past because of the rapid development of computer hardware and software. This idea is in accord with the argument of Kay (1993), Longstreet and Sorant (1985), and Rhodes (1986).

3. The grand mean of importance level of identified computer skills as rated by agents (3.29), sales managers (3.71), and computer directors (3.59), indicated that the importance level was between 3 (moderately important) and 4 (fairly highly important). Based on means for each skill, four items from agents, three items from computer directors, and no items from sales managers were rated lower than 3

(moderately important). Nine items from sales managers, six items from computer directors, and no item from agents were rated higher than 4 (fairly highly important). This may imply that using computers in agents' work has been of importance to the Taiwanese life insurance industry.

4. After comparing average ratings of importance levels given by the three groups investigated, it was discovered that there were many significant differences between agents and sales managers, 28 out of a total of 49 computer skills identified. Although so many significant differences occurred between agents and sales managers, the general ranking of computer skills, was quite similar.

5. Only four significant differences out of 49 skills were found between agents and computer directors. Four significant differences between sales managers and computer directors were found as well. However, because the sample size of computer directors was rather small, caution should be exercised. Major differences on three out of four items, appeared between sales managers and computer directors in the category of basic computer skills. It is interesting to note that most differences (three out of four items) detected between agents and computer directors were related to administrative affairs, including administrative processing in communication technology, testing in computer-based training, and underwriting feasibility in artificial intelligence. This tends to support the argument of

Orlikowski and Gash (1994) that "technologists intend . . . improvements in group work while users perceive improvements in individual productivity" (p. 204). Furthermore, the ranking of identified important computer skills by computer directors is much different from that of agents and sales managers.

6. The grand means of perceived level of agent computer expertise, as identified by agents (2.38), sales managers (2.60), and computer directors (2.35), were between 3 (moderate level) and 2 (low level). Based on the means for each skill, only two categories from sales managers, and none from the other two groups, were rated higher than 3 (moderate level). One category from both agents and computer directors, and none from sales managers, were rated lower than 2 (low level).

One computer skill from agents, two from computer directors, and nine from sales managers were rated higher than 3 (moderate level). Nine items from computer directors, eight items from agents, and three items from sales managers were rated lower than 2 (low level). It appears from the responses that the general life insurance agent in Taiwan possesses lower than moderate expertise in using computers.

7. It is also surprising to find that no significant differences appeared between agents and computer directors regarding the perceived levels of agent computer expertise,

and only one significant difference was found between sales managers and computer directors. Like the importance level ratings, the most significant differences (eight out of nine) of perceived level of agent computer expertise were discovered between agents and sales managers.

Discussion

The findings of this study provide a glance at using computers in the Taiwanese agent's work. Based on the literature review, data analysis, in-depth interview and observation, the following discussion is offered.

The powerful functions of computers have attracted most life insurance people's attention and encouraged them to use computers in their work. Generally speaking, although all survey groups (agents, sales managers, and computer directors) placed a higher than moderate level of importance on using computers in the agent's work, they also perceived a lower level of agent expertise regarding computer skills. The gap between importance levels and level of current expertise appears to be a major problem, which might be caused by lack of appropriate training, environment, applications, and support from the home office. In accord with arguments of Colomo (1994) and Scafield and Shaw (1993), the salesforce is one of the most important assets for life insurance companies, but the last division to be considered for computerization. Therefore, there is a need for improvement in using computers by Taiwanese agents.

According to Yang et al. (1989), subjects surveyed who are interested in a topic tend to have more favorable responses. In contrast, those who are not familiar with the surveyed topic tend to avoid responding to the questionnaire. It is believed that agents responding to this survey had a higher tendency than average to use computers in their work. Compared to the 1.21 policies (calculated from the amount of new business and number of agents) of average monthly production of Taiwanese agents in 1994, most surveyed agents (51.0%) produced 1.1 to 3.0 policies every month and 40.6% of surveyed agents produced more than 3 policies per month. The implication is that the surveyed agents had higher production than the average agent. This result also corresponds with the findings of Inyang (1993), W. B. Lee (1994), and C. T. Tsai (1993).

According to McEnery and McEnery (1987), sales managers might project their own situation into their responses and the agents surveyed may tend to be lenient in rating themselves; both phenomena would have raised the ratings of the current expertise level of agents. The implication of this is that the real level of agent expertise may be even lower than the findings in this survey.

Only 32.7% of the surveyed agents individually owned and used a computer. Most of the agents surveyed shared the use of their computers with their agency members (38.2%), team members (17.3%) or families (5.9%) and about half of

surveyed agents used computers less than twice every week, which may mean they were not often using computers as an important tool for their work. This circumstance may have affected both their use of computers and the benefits derived from them.

There could be several reasons for the low reported level of agent expertise in important computer skills. The reason could be related to the agents themselves, the nature of insurance selling, the Taiwanese insurance market, and company policies.

Unlike agents in the US, most agents in Taiwan are female and many of them are housewives. Also, a large proportion of Taiwanese agents are part-time. This means that a lot of Taiwanese agents do not rely on the income of this job for a living. So, the necessity of professionalization is not so strong as for the full-time agent who relies on this job and sees this job as a lifelong career. The low monthly production of 1.21 policies on average means a low income, and so may have caused agents to hesitate to make the initial investment in computers.

Many agents believe that selling is "high-touch" work (depending on close interpersonal relationships) which can not be replaced by "high-tech." If insurance buying is more an emotional process than a reasoned decision, it may in some cases be inappropriate to use computers with the customer present, especially if they are not familiar and

confident with them. Computers might transfer the customer's attention from emotional considerations to calculations or the computer itself, and destroy the selling atmosphere which the agent wishes to create. The agent may feel that the computer makes the selling too complex and impersonal.

Many Chinese people buy products from people they are familiar with or trust. Insurance selling in Taiwan is more relationship-oriented than professional-oriented. Agents may feel a need to emphasize relationship building instead of professional services, such as financial planning and risk management. Therefore, using computers may seem unnecessary for many agents.

The policy of many life insurance companies is to pursue short-term benefits regardless of long-term strategies, such as unconstrained selection in recruitment, lack of appropriate training, little support for the salesforce, etc. Most companies do not have specific personnel to advocate using computers among the salesforce; therefore most Taiwanese agents rely on themselves to acquire computers and learn computer applications. Many computer companies also hesitate to become involved in this market because of a lack of support from life insurance companies. In this environment that lacks needed information, training, applications, and support, using computers becomes a low priority for most agents.

Since sales managers work so closely with agents, one would expect the differences in perception to be less than those between agents and computer directors, or sales managers and computer directors. It is surprising to note that most significant differences were found between agents and sales managers. This situation may be caused by the fact that sales managers have more experiences with computers and realize their importance for this industry. In contrast, overall, agents may have less of the needed knowledge to evaluate the importance of computer skills.

Significant differences related to importance level, as well as perceived present level of agent expertise, could have implications for training, since the sales manager is the primary resource for training. Since learning computer skills is a time consuming process, and since using computers may not reflect on performance right away, sales managers may promote sales first rather than constantly teach computer skills, even though they believe these skills are very important.

On the other hand, both ratings of importance level and current expertise by agents and computer directors were lower than those by sales managers, and there were only four significant differences in importance level and no significant differences in current expertise found between agents and computer directors. This may mean that computer directors have a better understanding of agents than sales

managers, which would be surprising considering the fact that many managers are also agents. It should be noted that the ranking of importance levels by computer directors was quite different from agents and the sample size of computer directors was small. The lack of significant difference between agents and computer directors does not necessarily mean an agreement between these groups. It might be that computer directors concentrated on the computerization of the home office operations and also lacked knowledge about agent tasks; therefore they overlooked the importance of using computers in agent work. In contrast, agents may have concentrated on the selling business and may have lacked knowledge about computer technology; thus they may have under-estimated the importance of computer unitization. Since both lower ratings were given by these two groups, that caused fewer differences between them, but the underlying reasons and considerations might be totally different. Further study needs to be made to clarify this issue.

Recommendations for Industry Improvement

Results of this study have contributed to the literature about using computers in the Taiwanese service industry, especially in the identification of important computer skills and comparing differences among three groups of key persons, including computer system developers, computer training deliverers, and computer end-users. Based

on the findings of this study, the following recommendations are made:

1. It is recommended that the leaders of the life insurance industry allocate more resources to promote using computers in agent work in order to enhance the productivity, services, and image of agents.

2. Based on the differences in the ranking order of importance level, computer system developers should allow themselves more time to communicate with agents and provide more computer applications to fit the practical needs of agents.

3. Sales managers need to constantly offer more information and training related to using computers in agent work in order to pursue long-term maximum benefits.

4. Life insurance agents should familiarize themselves with computer applications and attach more importance to using computers in their work.

5. Concerning the availability, practicality, and familiarity of computer applications, the promotion of using computers among Taiwanese agents should start from database management, word processing, and spreadsheet applications in order to get the best results.

6. The needed information and applications of advanced technology, including computer-mediated communication, training, and artificial intelligence should be provided to agents in order to allow them to concentrate on selling.

7. The differences between level of importance and present expertise (see Appendix I) can be referred to in order to design a practical computer training curriculum.

Recommendations for Future Study

Much of the literature notes that effectively using computers enhances the productivity of users. Compared to other industries, the service industry is a more information-intensive industry, which might benefit even more from using computers. Therefore, the following recommendations for further research are made:

1. Identify the facilitative and inhibitive factors for using computers in a service industry.

2. Identify the training needs for using computers in a service industry.

3. Identify the relationship between current expertise and perceived level of importance of computer skills in order to provide needed information for the implementation, training, and management of computer use in a service industry.

4. Develop and test a model for computer training programs in a service industry.

5. Identify the relationship between using computers and business performance in a service industry.

6. Replicate this study of using computers in the Taiwanese life insurance industry at three year intervals to

verify the results and findings of this study, and to see the changes in each three year period.

7. Replicate this study in another industry or area to determine the similarities and differences that exist when using the computer in a different setting.

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Appendix A

Important Computer Skills Identified for Life Insurance Agents in Taiwan

The Important Computer Skills Identified for Life Insurance Agents in Taiwan

I. Basic Computer Skills

1. Understanding basic concepts of computer hardware (knowledge of computer related devices and physical equipment including CPUs, disks, printers, modems, keyboards, cables, etc.)
2. Understanding basic concepts of computer software (knowledge of types of software, using manuals, loading software, etc.)
3. Keyboarding and data entry (efficiently using devices such as keyboards and mice)
4. Use of operating systems for personal computers (essential software, such as DOS, that controls the operation of a computer)
5. Programming (using a programming language such as BASIC to solve a problem, such as financial calculations)
6. Writing macros (creating a command that carries out several steps with one keystroke)
7. Hardware maintenance and troubleshooting (keeping computers and related devices in good working order by tests, measurements, replacements, adjustments, and repairs)

8. Software maintenance and troubleshooting (keeping software up to date, correcting errors, and making needed changes as required)

9. Self-directed learning by using introductory materials (including manuals, tutorials, etc.)

II. Database Applications--creating and maintaining a collection of information, such as names, addresses, and phone numbers of all customers.

1. Designing and displaying databases (for example, creating a record for every client such as name, address, phone number, etc.)

2. Sorting and displaying specific information from databases (arranging records in different ways, such as by city or age, for reports or mailing lists)

3. Making calculations in databases (for example, summing sales from all customers)

4. Creating relationships among databases (connecting databases to efficiently retrieve information, such as combining records of customers from two different databases)

5. Generating reports from databases (creating and modifying reports to best fit the specific needs, such as daily schedules, sales activity plans, customer reports, etc.)

III. Spreadsheet Applications--using a spreadsheet consisting of rows and columns to perform calculations on numerical data.

1. Creating a spreadsheet (for example, simple forms of business reports such as monthly sales reports)
2. Using formulas in worksheets (calculating numeric values in a spreadsheet, such as the future value of a new policy)
3. Using functions in worksheets (turning spreadsheets into statistical and financial analysis tools by using built-in functions that calculate values or perform operations)
4. Building graphs in worksheets (translating numbers on spreadsheets into graphs to help users gain an overview of the data to disclose trends and pinpoint problem areas)
5. Customizing worksheets (providing professional information according to specific needs of customers, such as family financial planning, risk management, insurance benefit analysis, tax planning, etc.)

IV. Word Processing and Desktop Publishing--storing, editing, and manipulating text by using computers and related devices.

1. Creating and editing documents (keying in and printing out text for private correspondence)
2. Formatting documents (enhancing the basic appearance of a document such as a formal report)
3. Designing publications (combining text and graphics for greeting cards, posters, newsletters, leaflets, and brochures)
4. Merging mail (mass-producing personal form letters)
5. Document management (efficiently filing, retrieving, merging, and editing existing documents)

V. Communication Technology--transmitting information electronically from one point to another through computers.

1. Electronic mail (electronically transmitting text messages locally and from remote locations to individuals or multiple recipients)
2. Voice mail (using a computer to record, time, and send voice messages to individuals or multiple recipients)
3. Computer facsimile (transferring documents from one computer facsimile device to another through

telephone lines using a modem which translates from computing signals to phone signals)

4. Access database through computer networks or modems (rapidly accessing and retrieving needed information from within the company or public/foreign databases)

5. Connecting with other computer users through modems (using a modem to directly connect through the telephone lines to another customer's, colleague's, or friend's computer in any town, country, etc.)

6. Administrative processing (using computer communication technology to instantaneously process applications, conservations, claims, underwriting, etc.)

VI. Presentation Technology--combining text, graphics, animation, audio and video for achieving optimal presentation impact.

1. Creating text presentations (using the most basic level of presentation software to enable agents to systematically introduce themselves, their company, insurance policies, financial planning, etc.)

2. Creating graphic presentations (adding graphics to text to enhance the effect of the presentation)

3. Creating multimedia programs (including some aspect of animation, audio, and/or video in presentations)

4. Using computers for one-on-one presentations (systematically presenting information during sales and/or recruiting interviews)

5. Using projection devices for presentations (connecting computers with a computer screen display panel, projector or VCR for expanded projection capabilities)

6. Using an automatic presentation program (automating the presenting of information in exhibitions, companies, prospects' and subagents' home, etc.)

VII. Training--using computers to augment individual learning by providing programmed training sequences.

1. Tutorial training (presenting factual information to guide learners in acquiring professional knowledge for employment in the life insurance industry)

2. Drill training (providing practice for selling skills such as approaching, explaining, handling objections, closing, etc.)

3. Simulation training (performing activities such as financial planning, risk management, sales and

recruiting interviews in an environment that is similar to the real world)

4. Testing (using computers to assess the progress of learning and identifying areas that need to be strengthened)

5. Distance learning (allowing trainees to take courses without physically attending the class by using computer and communication technology)

VIII. Artificial Intelligence--developing computer systems which are capable of simulating human reasoning and decision-making.

1. Expert consulting system (using a computer to provide expert answers for potential problems in sales activities)

2. Customized proposal (using computer software to provide optimal sales strategies and insurance packages related to prospects' strengths, such as income, family status, age, career, preferences, etc.)

3. Sales activities guide (automatically generating an appropriate daily work plan including To Do List, visitation schedule and routes, and performance index according to monthly business plans and databases mentioned in section II)

4. Self-diagnosis analysis (using the computer to get feedback on individual performance in areas such as operating procedures using the analysis of records for activity and performance)
5. Underwriting feasibility (providing underwriting feedback on the feasibility of acceptance of a prospect)
6. Approaching techniques (using tools for approaching prospects such as fortune telling, life cycle table, horoscopes, zodiac, etc.)
7. Computer games (entertaining self or the prospect's children to keep them occupied)
8. Voice and handwriting recognition (using the spoken or hand-written word to most efficiently communicate with a computer)

Appendix B

Approval Letter

The University of Northern Iowa

February 10, 1995

En-Ming Tseng
422 G St.
Cedar Falls, IA 50613

Dear En-Ming Tseng:

Your project, "Present Status and Perceived Importance of Computer Skills in a Taiwanese Service Industry", which you submitted for human subjects review on February 10, 1995 has been determined to be exempt from further review under the guidelines stated in the UNI Human Subjects Handbook. You may commence participation of human research subjects in your project.

Your project need not be submitted for continuing review unless you alter it in a way that increases the risk to the participants. If you make any such changes in your project, you should notify the Graduate College Office.

If you decide to seek federal funds for this project, it would be wise not to claim exemption from human subjects review on your application. Should the agency to which you submit the application decide that your project is not exempt from review, you might not be able to submit the project for review by the UNI Institutional Review Board within the federal agency's time limit (30 days after application). As a precaution against applicants' being caught in such a time bind, the Board will review any projects for which federal funds are sought. If you do seek federal funds for this project, please submit the project for human subjects review no later than the time you submit your funding application.

If you have any further questions about the Human Subjects Review System, please contact me. Best wishes for your project.

Sincerely,

Norris M. Durham, Ph.D.
Chair, Institutional Review Board

cc: Dr. David A. Walker, Associate Dean
Dr. Charles D. Johnson

Department of Sociology and Anthropology Cedar Falls, Iowa 50614-0513 (319) 273-2786 FAX: (319) 273-7104

Appendix C

Cover Letter

Dear life insurance consultant,

Congratulations! You have been selected as one of representatives for 180 thousand life insurance agents in Taiwan to express your professional opinion about the use of the computer in your work. This is the first nationwide study of this type, and will include opinions from life insurance agents, sales managers, and directors of computer department in life insurance companies. The findings of this survey will provide the necessary information for developing computer systems which best meet the needs of life insurance agents.

Because of the importance of this study, your opinions are very important. Please responsed to all questions in the questionnaire even if you have little experience with computers in your work. Please return this questionnaire by Feb. 20, 1995. Thank you very much for your cooperation.
Best wishes,

Sincerely yours,

En-Ming Tseng
D.I.T. Candidate
University of Northern Iowa

Endorser,

Dr. Charles D. Johnson
Dissertation Advisor

Dear Computer Director,

Congratulations! You have been recommended as one of representatives for computer directors in Taiwan to express your professional opinion about the use of the computer in life insurance agents' work. This is the first nationwide study of this type, and will include opinions from life insurance agents, sales managers, and directors of computer department in life insurance companies. The findings of this survey will provide the necessary information for developing computer systems which best meet the needs of life insurance agents.

Because of the importance of this study, your opinions are very important. Please respond to all questions in the questionnaire even if you have little experience with agents in your work. Please return this questionnaire by Feb. 20, 1995. Thank you very much for your cooperation. Best wishes,

Sincerely yours,

En-Ming Tseng
D.I.T. Candidate
University of Northern Iowa

Endorser,

Dr. Charles D. Johnson
Dissertation Advisor

Dear Sales Manager,

Congratulations! You have been selected as one of representatives for sales managers in Taiwan to express your professional opinion about the use of the computer in life insurance agents' work. This is the first nationwide study of this type, and will include opinions from life insurance agents, sales managers, and directors of computer department in life insurance companies. The findings of this survey will provide the necessary information for developing computer systems which best meet the needs of life insurance agents.

Because of the importance of this study, your opinions are very important. Please respond to all questions in the questionnaire even if you have little experience with computers in your work. Please return this questionnaire by Feb. 20, 1995. Thank you very much for your cooperation.

Best wishes,

Sincerely yours,

En-Ming Tseng
D.I.T. Candidate
University of Northern Iowa

Endorser,

Dr. Charles D. Johnson
Dissertation Advisor

敬愛的壽險顧問平安:

恭喜您經由電腦的抽樣選取,成為全台灣十八萬壽險行銷伙伴的代表,對於電腦在壽險行銷工作中的角色,表達您專業的意見。本調查是有史以來第一次大規模針對壽險行銷工作電腦化的研究〔分別調查全國壽險公司電腦部門專業人員,業務單位主管及行銷人員的看法〕。所獲得的結果,將可提供相關的機構更具體的資料,以發展對您的工作更實用的電腦系統。使得壽險行銷的工作更專業,更有效率,更輕鬆愉快。

您的寶貴意見對本研究非常重要,懇請就下列問題圈選適當的答案(您個人認為,下列技巧對您未來工作的重要程度,以及您個人目前使用該技巧的程度)。無論您是否有使用電腦的經驗,均請就您的了解作答。所有的答案均沒有對與錯之分,僅供本研究分析之用,並且保證以匿名方式處理。請您代表全台灣十八萬壽險行銷伙伴安心作答,並於三日內寄回完成的問卷。謝謝您的合作!

敬 祝

工作愉快 業績輝煌

美國北愛荷華州立大學產業科技研究所
指導教授 : 查爾斯・強森 博士
博士候選人: 曾 恩 明

敬上

中 華 民 國 八十四 年 元 月 二十六 日

敬愛的業務主管平安:

恭喜您經由電腦的抽樣選取,成為全台灣壽險業務主管的代表,對於電腦在壽險行銷人員工作中的角色,表達您專業的意見。本調查是有史以來第一次大規模,針對壽險行銷工作電腦化的研究〔分別調查全國壽險公司電腦部門專業人員,業務主管及行銷人員的看法〕。所獲得的結果,將可提供相關的機構更具體的資料,以發展對業務行銷工作更實用的電腦系統,使得壽險行銷的工作更專業,更有效率,更輕鬆愉快。

本研究係針對電腦在業務人員工作上的運用,您的寶貴意見對本研究非常重要,懇請就下列問題(您個人認為,下列技巧對壽險行銷人員未來工作的重要程度,以及您個人認為,目前他們使用該技巧的程度)圈選適當的答案。無論您是否有使用電腦的經驗,均請就您的了解作答。所有的答案均沒有對與錯之分,僅供本研究分析之用,並且保證以匿名方式處理。請您代表全台灣壽險業務主管們安心作答,並於三日內寄回完成的問卷。謝謝您的合作!

敬 祝

工作愉快 業績輝煌

美國北愛荷華州立大學產業科技研究所
指導教授 : 查爾斯・強森 博士
博士候選人: 曾 恩 明

敬上

中 華 民 國 八十四 年 元 月 二十六 日

敬愛的電腦主管平安:

恭喜您經由各方的推薦,成為全台灣電腦專業人士的代表，對於電腦在壽險行銷人員工作中的角色，表達您專業的意見。本調查是有史以來第一次大規模，針對壽險行銷工作電腦化的研究〔分別調查全國壽險公司電腦部門專業人員，業務單位主管及行銷人員的看法〕。所獲得的結果，將可提供相關的機構更具體的資料,以發展對壽險行銷工作更實用的電腦系統，使之更專業、更有效率、更輕鬆愉快。

本研究係針對電腦在壽險行銷工作上的運用，您的寶貴意見對本研究非常重要，懇請就下列問題(您個人認為，下列技巧對壽險行銷人員未來工作的重要程度，以及您個人認為，目前他們使用該技巧的程度)圈選適當的答案。無論您是否有直接與行銷人員接觸的經驗，均請就您的了解作答。所有的答案均沒有對與錯之分,僅供本研究分析之用，並且保證以匿名方式處理。請您代表全台灣電腦專業人士安心作答，並於三日內寄回完成的問卷。謝謝您的合作！

敬　祝

工作愉快　身體健康

美國北愛荷華州立大學產業科技研究所
指導教授　：　查爾斯・強森 博士
博士候選人：　曾　恩　明

敬上

中　華　民　國　八十四　年　元　月　二十六　日

Appendix D

Questionnaires

Instructions

Below are eight sections, each dealing with computer skills for life insurance agents in their work. Every item is followed by two scales. Please circle the number that best describes your thoughts regarding computer use by life insurance agents including level of importance and current expertise. The scale is 1 (not any) to 5 (very high). Please answer all the questions even if you have little experience with computers in your work. There are no wrong answers. All responses are anonymous and will be kept confidential.

QUESTIONNAIRE

	Level of Importance	Current Expertise
I. Basic Computer Skills	1. Not Any 2. Low 3. Moderate 4. Fairly High 5. Very High	
1. Understanding basic concepts of computer hardware (knowledge of computer related devices and physical equipments including CPUs, disks, printers, modems, keyboards, cables, etc.)	1....2....3....4....5	1....2....3....4....5
2. Understanding basic concepts of computer software (knowledge of types of software, using manuals, loading software, etc.	1....2....3....4....5	1....2....3....4....5
3. Keyboarding and data entry (efficiently using devices such as keyboards ad mice)	1....2....3....4....5	1....2....3....4....5
4. Use of operating systems for personal computers (essential software, such as DOS, that controls the operation of a computer)	1....2....3....4....5	1....2....3....4....5
5. Programming (using a programming language such as BASIC to solve a problem, such as financial calculations)	1....2....3....4....5	1....2....3....4....5
6. Writing macros (creating a command that carries out several steps with one keystroke)	1....2....3....4....5	1....2....3....4....5
7. Hardware maintenance and troubleshooting (keeping computers and related devices in good working order by tests, measurements, replacements, adjustments, and repairs)	1....2....3....4....5	1....2....3....4....5
8. Software maintenance and troubleshooting (keeping software up to date, correcting errors, and making needed changes as required)	1....2....3....4....5	1....2....3....4....5
9. Self-directed learning by using introductory materials (including manual, tutorials, etc.)	1....2....3....4....5	1....2....3....4....5

	Level of Importance	Current Expertise
	1. Not Any 2. Low 3. Moderate 4. Fairly High	5. Very High
II. Database Management (creating and maintaining a collection of information, such as names, addresses, and phone numbers of all customers)		
10. Designing and displaying databases (for example creating a record for every client such as name, address, phone number, etc.)	1....2....3....4....5	1....2....3....4....5
11. Sorting and displaying specific information from databases (arranging records in different ways, such as by city or age, for reports or mailing lists)	1....2....3....4....5	1....2....3....4....5
12. Making calculations in databases (for example, summing sales from all customers)	1....2....3....4....5	1....2....3....4....5
13. Creating relationships among databases (connecting databases to efficiently retrieve information, such as combining records of customers from two different databases)	1....2....3....4....5	1....2....3....4....5
14. Generating reports from databases (creating and modifying reports to best fit the specific needs, such as daily schedules, sales activity plans, customer reports, etc.)	1....2....3....4....5	1....2....3....4....5
III. Spreadsheet Applications (using a spreadsheet consisting of rows and columns to perform calculations on numerical data)		
15. Creating a spreadsheet (for example, simple forms of business reports such as monthly sales reports)	1....2....3....4....5	1....2....3....4....5
16. Using formulas in worksheets (calculating numeric values in a spreadsheet such as the future value of a new policy)	1....2....3....4....5	1....2....3....4....5
17. Using functions in worksheets (turning spreadsheets into statistical and financial analysis tools by using built-in functions that calculate values or perform operations)	1....2....3....4....5	1....2....3....4....5
17. Building graphs in worksheets (translating numbers on spreadsheets into graphs to help users gain an overview of the data to disclose trends and pinpoint problem areas)	1....2....3....4....5	1....2....3....4....5
18. Customizing worksheets (providing professional information according to specific needs of customers, such as family financial planning, risk management, insurance benefit analysis, tax planning, etc.)	1....2....3....4....5	1....2....3....4....5

	Level of Importance	Current Expertise
	1. Not Any 2. Low 4. Fairly High	3. Moderate 5. Very High
IV. Word Processing (storing, editing, and manipulating text by using computers and related devices)		
20. Creating and editing documents (keying in and printing out text for private correspondence)	1....2....3....4....5	1....2....3....4....5
21. Formatting documents (enhancing the basic appearance of a document such as a formal report)	1....2....3....4....5	1....2....3....4....5
22. Designing publications (combining text and graphics for greeting cards, posters, newsletters, leaflets, and brochures)	1....2....3....4....5	1....2....3....4....5
23. Merging mail (mass-producing personal form letters)	1....2....3....4....5	1....2....3....4....5
24. Document management (efficiently filing, retrieving, merging, and editing existing documents)	1....2....3....4....5	1....2....3....4....5
V. Communication Technology (transmitting information electronically from one point to another through computers)		
25. Electronic mail (electronically transmitting text messages locally and from remote locations to individuals or multiple recipients)	1....2....3....4....5	1....2....3....4....5
26. Voice mail (using a computer to record, time, and send voice messages to individuals or multiple recipients)	1....2....3....4....5	1....2....3....4....5
27. Computer facsimile (transferring documents from one computer facsimile device to another through telephone lines using a modem which translates from computing signals to phone signals)	1....2....3....4....5	1....2....3....4....5
28. Access database through computer networks or modems (rapidly assessing and retrieving needed information from within the company's or public/foreign databases)	1....2....3....4....5	1....2....3....4....5
29. Connecting with other computer users through modems (using a modem to directly connect through the telephone lines to another customer's, colleague's, or friend's computer in any town, country, etc.)	1....2....3....4....5	1....2....3....4....5
30. Administrative processing (using computer communication technology to instantaneously process applications, conservations, claims, underwriting, etc.)	1....2....3....4....5	1....2....3....4....5

	Level of Importance	Current Expertise
	1. Not Any 2. Low 4. Fairly High	3. Moderate 5. Very High
VI. Presentation Technology (combining text, graphics, animation, audio and video for achieving optimal presentation impact)		
31. Creating text presentations (using the most basic level of presentation software to enable agents to systematically introduce themselves, their company, insurance policies, financial planning, etc.)	1....2....3....4....5	1....2....3....4....5
32. Creating graphic presentations (adding graphics to text to enhance the effect of the presentation)	1....2....3....4....5	1....2....3....4....5
33. Creating multimedia programs (including of some aspect of animation, audio, and/or video in presentations)	1....2....3....4....5	1....2....3....4....5
34. Using computers for one-on-one presentations (systematically presenting information during sales and/or recruiting interviews)	1....2....3....4....5	1....2....3....4....5
35. Using projection devices for presentations (connecting computers with an computer screen display panel, projector or VCR for expanded projection capabilities)	1....2....3....4....5	1....2....3....4....5
36. Using an automatic presentation program (automating the presenting of information in exhibitions, companies, prospects' and subagents' home, etc.)	1....2....3....4....5	1....2....3....4....5
VII. Computer-based Training (using computers to augment individual learning by providing programmed training sequences)		
37. Tutorial training (presenting factual information to guide learners in acquiring professional knowledge for employment in the life insurance industry)	1....2....3....4....5	1....2....3....4....5
38. Drill training (providing practice for selling skills such as approaching, explaining, handling objections, closing, etc.)	1....2....3....4....5	1....2....3....4....5
39. Simulation Training (performing activities such as financial planning, risk management, sales and recruiting interviews in an environment that is similar to the real world)	1....2....3....4....5	1....2....3....4....5
40. Testing (using computers to assess the progress of learning and identifying areas that need to be strengthened)	1....2....3....4....5	1....2....3....4....5
41. Distance learning (allowing trainees to take courses without physically attending the class by using computer and communication technology)	1....2....3....4....5	1....2....3....4....5

	Level of Importance	Current Expertise
	1. Not Any 2. Low 3. Moderate 4. Fairly High 5. Very High	
VIII. Artificial Intelligence (Developing computer systems which are capable of simulating human reasoning and decision-making)		
42. Expert consulting system (using a computer to provide expert answers for potential problems in sales activities)	1....2....3....4....5	1....2....3....4....5
43. Customized proposal (using computer software to provide optimal sales strategies and insurance packages related to prospects' strengths, such as income, family status, age, career, preferences, etc.)	1....2....3....4....5	1....2....3....4....5
44. Sales activities guide (automatically generating an appropriate daily work plan including To Do List, visitation schedule and routes, and performance index according to monthly business plan and databases mentioned in section II)	1....2....3....4....5	1....2....3....4....5
45. Self-diagnosis analysis (using the computer to get feedback on individual performance in areas such as operating procedures using the analysis of records for activity and performance)	1....2....3....4....5	1....2....3....4....5
46. Underwriting feasibility (providing underwriting feedback on the feasibility of acceptance of a prospect)	1....2....3....4....5	1....2....3....4....5
47. Approaching techniques (using tools for approaching prospects such as fortune telling, life cycle table, horoscopes, zodiac, etc.)	1....2....3....4....5	1....2....3....4....5
48. Computer games (entertaining self or the prospect's children to keep them occupied)	1....2....3....4....5	1....2....3....4....5
49. Voice and handwriting recognition (using the spoken or hand-written word to most efficiently communicate with a computer)	1....2....3....4....5	1....2....3....4....5

A. Gender 1. Male 2. Female

B. Age 1. Under 25 2. 26 - 35 3. 36 - 45
4. 46 - 55 5. Above 55

C. Education 1. Junior high school 2. High school 3. Junior college
4. College or university 5. Graduate school (masters or doctorate)

D. Years on the job
1. Less than 1 year 2. 1 - 3 years 3. More than 3 - 5 years
4. More than 5 - 10 years 5. More than 10 years

E. Your company is
1. Old domestic company 2. American company 3. New domestic company

◎ Following questions are only for agents

F. The situation of using computers
1. Individually own and use 2. Sharing with families
3. Sharing with team members in office 4. Sharing with agency members
5. Not at all

G. The frequency of using computers
1. More than twice per day 2. More than twice per week to twice per day
3. More than once per week to twice per week
4. More than once per month to once per week 5. Once per month or less

H. Major geographical area
1. Metropolitan area (the 5 biggest cities in Taiwan)
2. Urban (except the top 5 cities) area 3. Suburban or rural area

I. The average number of policies of monthly production in the last year
1. Less than 1 2. 1.1 - 3.0 3. 3.1 - 5.0 4. 5.1 - 8.0
5. More than 8.0

※ Please make any comment regarding this study on the reverse side of this paper. Thanks again for your cooperation.

Control No.:

保險行銷人員使用電腦問卷

注意事項

在下列五十項電腦技巧中，請就您認爲該項技巧，對於壽險行銷人員未來工作的重要程度，及您目前自己使用該技巧的程度，分別在後面的量表中，圈選最適當的一個數字(由1到5，分別代表完全沒有到非常高)。回答無對錯，且將保密。無論您有無電腦經驗，均請回答所有問題。謝謝！

第一部份　基本電腦技巧

		重要程度	使用程度
		1 2 3 4 5 完全沒有 低 中等 高 非常高	1 2 3 4 5 完全沒有 低 中等 高 非常高
1	對於電腦硬體的基本概念(電腦及相關的機器設備，如鍵盤、中央處理器、磁碟機、印表機、光碟機、數據機及顯示器等)	1....2....3....4....5	1....2....3....4....5
2	對於電腦軟體的基本概念(初步的了解如何運用一系列的指令，驅使電腦處理各種資料，以得到使用者所需要的結果)	1....2....3....4....5	1....2....3....4....5
3	鍵盤的操作與資料輸入(使用鍵盤、滑鼠等輸入設備及中英文輸入法，輸入需要處理之資料或下達對電腦的指令)	1....2....3....4....5	1....2....3....4....5
4	個人電腦操作系統的使用(控制電腦程式的執行，例如一般常用的DOS；可提供輸出入控制、程式編輯、記憶體分配、資料管理以及相關的功能)	1....2....3....4....5	1....2....3....4....5
5	簡單的程式設計(如何設計一系列的指令，以運用電腦強大的功能，解決既定的問題，並提供所需的答案)	1....2....3....4....5	1....2....3....4....5
6	巨集指令(現有流行的軟體多提供此一功能；使用者可將需要經常反覆操作的動作，設定爲一個巨集，而於日後以單鍵叫出，自動處理此項繁雜的作業)	1....2....3....4....5	1....2....3....4....5
7	硬體的初級保養維護與故障排除(簡單的測試、調整、更換零件及修理，以保持電腦及相關設備於良好的狀況)	1....2....3....4....5	1....2....3....4....5
8	軟體的初級保養維護與故障排除(簡單的軟體安裝、更新、偵錯、及必要的修改，以配合環境要求的改變)	1....2....3....4....5	1....2....3....4....5
9	參考各種操作手冊及資料，以自行學習使用軟硬體的能力	1....2....3....4....5	1....2....3....4....5

保險行銷人員使用電腦問卷

第二部份 資料庫應用
(建立、修改、組織、搜尋、運用和維護一系列的資料，以達成所需要的結果)

		重要程度	使用程度
		1 2 3 4 5 完全沒有 低 中等 高 非常高	1 2 3 4 5 完全沒有 低 中等 高 非常高
10	資料庫的設計及顯示(建立及參考相關的資料庫，包括保戶、準保戶、增員對象、審查核保、保全理賠、行政事務、法令規章等資料庫)	1....2....3....4....5	1....2....3....4....5
11	資料庫的檢索排序(以各種不同方式，安排資料及整理出所需的資料；例如依照客戶的職業、職位、生日、地址、保單種類等資料，列印拜訪或寄信的名單)	1....2....3....4....5	1....2....3....4....5
12	資料的運算(設定資料間的計算關係，以自動於設定欄位產生新數值，不需每次輸入或重新計算；例如業績總額、平均保費收入、最高佣金保單等)	1....2....3....4....5	1....2....3....4....5
13	建立資料庫間的相關性(以相同的項目如姓名或身份證字號，連結不同的資料庫，可同時修改及運用不同資料庫的紀錄，而不需重覆操作；可節省行政事務處理及客戶資料管理等工作的時間)	1....2....3....4....5	1....2....3....4....5
14	建立自行設計的報表(整理及修改適合各種特殊需要的報表，如行事曆、工作計畫表、目標市場客戶清單、行政事務追蹤表等，以配合個人工作上獨特的需要)	1....2....3....4....5	1....2....3....4....5

第三部份 試算表應用
(使用包含行與列的矩陣式表格，作數字資料的運算與處理)

		重要程度	使用程度
		1 2 3 4 5 完全沒有 低 中等 高 非常高	1 2 3 4 5 完全沒有 低 中等 高 非常高
15	建立簡單的表格(主要運用電腦的印刷及儲存功能，如僅呈現相關數字的業務報表、保險建議書、和同業商品比較表等)	1....2....3....4....5	1....2....3....4....5
16	建立運用公式的試算表(進一步規劃試算表的格式、以運算公式建立各資料間的關係，並產生新的相關數字資料，如修改年齡、保額、年期或商品，表中相關數字立即自動隨之修改，大幅提高試算表的功能)	1....2....3....4....5	1....2....3....4....5
17	建立運用內建函數功能的試算表(運用軟體內已經設定、而可以執行繁複運算及操作的函數功能，以轉換試算表爲統計與財務分析工具，可用於精密的財務投資及退休年金分析，以充份發揮試算表的強大功能)	1....2....3....4....5	1....2....3....4....5

保險行銷人員使用電腦問卷

18	建立各種圖表(轉換試算表中的統計數字爲圖表，協助使用者迅速獲得完整概念、了解發展趨勢及指出問題點)	1....2....3....4....5	1....2....3....4....5
19	設計專業表格(針對客戶的特殊需要，提供專業資訊表格，如保險利益分析表、財務規劃書、風險管理表、稅務規劃表等)	1....2....3....4....5	1....2....3....4....5
	第四部份　文書處理及編輯 **(利用電腦及相關設備建立、修改、編輯、和儲存文件)**	**重要程度** 1 2 3 4 5 完全沒有 低 中等 高 非常高	**使用程度** 1 2 3 4 5 完全沒有 低 中等 高 非常高
20	建立及編輯各種私人信件	1....2....3....4....5	1....2....3....4....5
21	製作各種文件(如建議書、企劃書、報告書、對公司及客戶的正式文件等)	1....2....3....4....5	1....2....3....4....5
22	各種印刷品的編輯設計(結合圖像與文字，如各種賀卡、海報、傳單、小冊子及個人給客戶的新聞信等)	1....2....3....4....5	1....2....3....4....5
23	大量信件的製作(運用信件合併功能，製作大量內含對方姓名或其他個別資料的個人化制式信件；可結合已有的資料庫，作直接銷售或客戶聯繫信函)	1....2....3....4....5	1....2....3....4....5
24	文件管理(對於大量的文件，作有系統的整理、歸檔、運用)	1....2....3....4....5	1....2....3....4....5
	第五部份　通訊技術 **(透過電腦網路或現有電話系統的連接，及能相互轉換電腦數位訊號及電話類比訊號的數據機，傳遞各種資訊)**	**重要程度** 1 2 3 4 5 完全沒有 低 中等 高 非常高	**使用程度** 1 2 3 4 5 完全沒有 低 中等 高 非常高
25	電子郵件 (俗稱E-MAIL,是在電腦網路上普遍運用的訊息傳遞工具，兼具快速、價廉、一對一或一對多人同時傳輸各種資料檔案的功能)	1....2....3....4....5	1....2....3....4....5
26	語音信箱 (由電腦控制之語音系統，可將語音轉換爲數位訊號，除一般留話功能外，亦有定時傳話、一對多傳話等功能)	1....2....3....4....5	1....2....3....4....5
27	電腦傳眞 (可將電腦製作之文件或圖像檔案，經由數據機及電話系統傳眞給對方；有定時傳送、一對多傳眞、自動重撥、自動接收傳眞；許多人利用此功能做傳眞行銷及服務)	1....2....3....4....5	1....2....3....4....5
28	連結各種資料庫 (包括總公司、業務單位、公共的、甚至外國的資料庫，以查詢及抓取所需資料檔案)	1....2....3....4....5	1....2....3....4....5

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29	透過數據機與其他電腦用戶連繫及傳輸資料(包括同事、客戶、協力者、新人、朋友等；無論國內或國外，均可如電話般的連繫上)	1....2....3....4....5	1....2....3....4....5
30	行政事務處理 (可透過電腦的連繫辦理各種手續，如要保書送審、資料變更、保全、申請理賠、核保發單等事務)	1....2....3....4....5	1....2....3....4....5
	第六部份 簡報技術 **(結合運用文字、圖像、動畫、聲音、影像等，以吸引觀眾並使其易於了解)**	**重要程度** 1 2 3 4 5 完全沒有 中低等 非常高高	**使用程度** 1 2 3 4 5 完全沒有 中低等 非常高高
31	建立文字簡報(簡報軟體最基本的運用；僅以文字大綱的方式，有系統的介紹自己、公司、保險、商品等)	1....2....3....4....5	1....2....3....4....5
32	建立圖像簡報(於文字簡報中，加入相關的圖案、相片、統計圖表等，以提高簡報的效果)	1....2....3....4....5	1....2....3....4....5
33	建立多媒體簡報(除了圖文之外，並於簡報中加入動畫、聲音、或影像，使得簡報更生動、活潑、易懂及吸引人)	1....2....3....4....5	1....2....3....4....5
34	使用電腦的簡報技巧(運用電腦及已建立之簡報軟體，在銷售及增員面談中，有系統的介紹有關的資料與構想)	1....2....3....4....5	1....2....3....4....5
35	使用電腦及投影器材作團體簡報的技巧 (以電腦連結液晶投影板、彩色投影機、電視等，投射電腦畫面於螢幕上，於團體保險、職團開拓或專業市場等經營時，對團體觀眾作說明)	1....2....3....4....5	1....2....3....4....5
36	使用電腦作自動簡報展示 (以電腦控制畫面的顯示及聲音的說明作自動簡報；利用各種展覽會、或客戶公司內作展示行銷，並可作爲增員及銷售的媒體，如同錄影帶一般寄給對方)	1....2....3....4....5	1....2....3....4....5
	第七部份 電腦輔助訓練 **(使用電腦提供學員有系統的訓練課程， 以加強個人化的學習)**	**重要程度** 1 2 3 4 5 完全沒有 中低等 非常高高	**使用程度** 1 2 3 4 5 完全沒有 中低等 非常高高
37	教導式的訓練(提供相關資料與事例，引導學員學習專業知識，如保險的意義及功能、商品知識、及法令規章等)	1....2....3....4....5	1....2....3....4....5
38	練習式訓練 (針對各個不同的銷售過程，如接近、說明、拒絕處理、促成等所需具備的技巧，提供必要的演練訓練)	1....2....3....4....5	1....2....3....4....5

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39	模擬式訓練(模擬眞實世界的狀況，提供實際操作的機會，如財務規劃、理財投資、和風險管理等之說明，以及增員和銷售面談)	1....2....3....4....5	1....2....3....4....5
40	測驗(運用電腦測試學習進度，並決定需要加強的地方)	1....2....3....4....5	1....2....3....4....5
41	通訊學習(透過電腦及通訊技術，使學員不必到達教室，仍可以同時參加訓練)	1....2....3....4....5	1....2....3....4....5
		重要程度	**使用程度**
	第八部份　人工智慧 **(最新發展中的電腦系統，具有模擬人類邏輯思考、學習辨識、決策判斷及感覺的能力)**	1 2 3 4 5 完 非 全 中 常 沒 高 有 低 等 高	1 2 3 4 5 完 非 全 中 常 沒 高 有 低 等 高
42	專家諮詢系統 (運用電腦上的知識庫，解答各種銷售活動中可能出現的問題)	1....2....3....4....5	1....2....3....4....5
43	銷售策略及保單設計 (針對所蒐集之客戶的特性，如個性、年齡、職業等，提供最佳的銷售策略及保險組合)	1....2....3....4....5	1....2....3....4....5
44	業務活動指導 (根據所訂業務目標、計畫和已建立之客戶資料檔，自動提供各項活動指標、應拜訪客戶名單、應處理事務清單、甚至拜訪路線及時間表等)	1....2....3....4....5	1....2....3....4....5
45	自我診斷分析 (針對個人績效數字及活動記錄之分析、自動提供應該改善及調整之項目，如拜訪次數、提高保額、索取介紹、時間管理及面談時間等)	1....2....3....4....5	1....2....3....4....5
46	簡易審查核保 (根據所屬公司的審查核保準則, 模擬審查所輸入之客戶資料，提供可能的核保條件，以便提前預作準備，免得徒勞往返)	1....2....3....4....5	1....2....3....4....5
47	各種智慧型的接近媒體 (如紫微斗數、命相學、星座、血型、姓名學與生理週期表等的運用，以吸引客戶，創造有利的面談機會)	1....2....3....4....5	1....2....3....4....5
48	電腦遊戲(可作安撫客戶小孩的工具，以避免面談中，來自小孩的吵鬧打擾；亦可作自己消遣之用)	1....2....3....4....5	1....2....3....4....5
49	手寫文字及語音辨識系統(可轉換手寫文字和口說語音，爲電腦可接受的文字及指令，使電腦的輸入及使用更人性化)	1....2....3....4....5	1....2....3....4....5

保險行銷人員使用電腦問卷

一. 性 別　　1. 男　　2. 女

二. 年 齡　　1. 25歲以下　　2. 25 - 35 歲　　3. 35 - 45 歲
4. 45 - 55 歲　　5. 55 歲以上

三. 教育程度　　1. 國中畢業(含)以下　2. 高中畢業　　3. 專科畢業
4. 大學畢業　　5. 研究所畢業(請註明碩士或博士)

四. 從事壽險工作年資
1. 一年以下　　2. 一 — 三年　　3. 三年以上，五年以下
4. 五年以上，十年以下　　5. 十年以上

五. 您所服務的公司:_____人壽保險股份有限公司
1. 本地老公司(52年前成立)　　2. 美商公司　　3. 本地新公司

六. 您的職務是_____.(以下部份主管免填)

七. 使用電腦情形
1. 本身單獨擁有及使用　　2. 家人共用　　3. 公司內小組共用
4. 全辦公室共用　　5. 沒有使用

八. 使用電腦頻率
1. 每天兩次以上　　2. 每週兩次以上至每天兩次
3. 每週一次以上至二次　　4. 每月一次以上至每週一次
5. 每月少於一次

九. 工作區域 (主要客戶所居住之區域)
1. 大都會區 (基隆、台北、台中、台南、高雄等大都市)
2. 城市 (縣轄市區域)　　3. 郊區及鄉村

十. 最近一年來，平均每月新契約件數
1. 1件(含)以下　　2. 1.1 - 3.0 件　　3. 3.1 - 5.0 件
4. 5.1 -8.0 件　　5. 8.0 件以上

註:倘若您對此一研究有任何意見，歡迎利用背面或另紙書寫。再次謝謝您的合作！

Appendix E

The Importance Level of Identified Computer Skills

Appendix E
The Importance Level of Identified Computer Skills

No.	COMPUTER SKILLS	Grand M.	Ran.	Agent	Ran.	Sales Mgr.	Ran.	Com. Dir.	Ran.
11	Sorting specific information	3.94	1	3.70	1	4.34	1	4.00	6
10	Designing databases	3.81	2	3.61	3	4.16	2	3.75	19
21	Formatting documents	3.79	3	3.53	6	4.16	3	4.20	2
43	Customized proposal	3.77	4	3.66	2	3.89	13	4.05	4
13	Relationing among databases	3.71	5	3.54	5	4.07	4	3.33	34
23	Merging mail	3.71	6	3.50	8	4.04	5	3.85	14
24	Document management	3.70	7	3.48	9	4.04	6	3.90	8
44	Sales activities guide	3.67	8	3.55	4	3.88	15	3.71	20
45	Self-diagnosis analysis	3.66	9	3.51	7	3.91	12	3.67	23
20	Creating and editing documents	3.65	10	3.40	15	4.02	7	3.95	7
14	Generating reports	3.64	11	3.43	13	3.99	10	3.62	25
15	Creating a spreadsheet	3.64	12	3.47	11	3.89	14	3.81	16
19	Customizing worksheets	3.64	13	3.41	14	4.00	9	3.70	21
12	Calculating in databases	3.63	14	3.40	16	4.01	8	3.62	24
22	Designing publications	3.62	15	3.46	12	3.83	19	3.85	15
31	Creating text presentations	3.61	16	3.36	19	3.99	11	3.90	9
16	Using formulae in worksheets	3.60	17	3.48	10	3.84	18	3.43	31
3	Keyboarding and data entry	3.58	18	3.40	17	3.83	20	3.86	12
34	One-on-one computer presentations	3.57	19	3.38	18	3.85	17	3.81	17
32	Creating graphic presentations	3.50	20	3.24	27	3.87	16	3.86	11
33	Creating multimedia programs	3.45	21	3.26	24	3.75	21	3.52	27
37	Tutorial training	3.45	22	3.26	25	3.70	24	3.90	10
2	Basic software concepts	3.44	23	3.35	20	3.62	27	3.29	35
30	Administrative processing	3.44	24	3.21	30	3.69	25	4.19	3
38	Drill training	3.44	25	3.25	26	3.67	26	3.86	13
35	Using projection devices	3.43	26	3.21	31	3.75	22	3.76	18
46	Underwriting feasibility	3.41	27	3.28	22	3.46	38	4.29	1
47	Approaching techniques	3.40	28	3.31	21	3.52	34	3.62	26
17	Using functions in worksheets	3.38	29	3.19	35	3.73	23	3.19	40
42	Expert consulting system	3.37	30	3.27	23	3.52	35	3.43	32
9	Self-directed learning	3.35	31	3.23	28	3.58	29	3.19	41
18	Building graphs in worksheets	3.35	32	3.20	32	3.61	28	3.25	37
1	Basic hardware concepts	3.30	33	3.16	36	3.56	31	3.29	36
28	Access database via modems	3.29	34	3.12	39	3.53	33	3.50	28
39	Simulation training	3.29	35	3.16	37	3.49	36	3.48	29
4	Use of operating systems	3.28	36	3.20	33	3.53	32	2.62	47
6	Writing macros	3.26	37	3.23	29	3.46	39	2.40	48
8	Software maintenance	3.25	38	3.20	34	3.37	41	3.05	46
27	Computer facsimile	3.23	39	3.04	43	3.49	37	3.70	22
40	Testing	3.23	40	3.07	41	3.34	43	4.05	5
49	Voice & handwriting recognition	3.22	41	3.13	38	3.34	42	3.48	30
36	Automatic presentation program	3.20	42	2.97	47	3.58	30	3.38	33
25	Electronic mail	3.19	43	3.04	44	3.44	40	3.15	43
7	Hardware maintenance	3.11	44	3.12	40	3.09	48	3.19	42
41	Distance learning	3.11	45	3.07	42	3.15	47	3.24	39
29	Connecting other computers	3.10	46	2.98	46	3.30	44	3.14	44
26	Voice mail	3.02	47	2.89	49	3.19	46	3.25	38
48	Computer games	3.02	48	3.01	45	3.02	49	3.10	45
5	Programming	2.98	49	2.93	48	3.19	45	2.33	49

Appendix F

Significant Differences of Perceived Importance Level

Appendix F
Significant Differences of Importance Level Among Surveyed Groups

No	Important Computer Skills	Agent		Sales Mgr.		Com. Dir.		F	Sig. Dif.		
		M	S.D.	M	S.D.	M	S.D.	Prob.	A-M	M-D	D-A
1	Basic hardware concepts	3.16	1.21	3.56	0.95	3.29	0.87	0.0065	*		
2	Basic software concepts	3.35	1.21	3.62	1.02	3.29	0.90	0.0822			
3	Keyboarding and data entry	3.40	1.31	3.83	0.91	3.86	0.96	0.0036	*		
4	Use of operating systems	3.20	1.27	3.53	1.03	2.62	0.86	0.0015		*	
5	Programming	2.93	1.22	3.19	1.20	2.33	1.02	0.0068		*	
6	Writing macros	3.23	1.24	3.46	1.23	2.40	0.82	0.0014		*	*
7	Hardware maintenance	3.12	1.39	3.09	1.17	3.19	0.93	0.9441			
8	Software maintenance	3.20	1.34	3.37	1.19	3.05	1.02	0.3960			
9	Self-directed learning	3.23	1.3	3.58	1.01	3.19	0.81	0.0305			
10	Designing databases	3.61	1.37	4.16	1.01	3.75	0.91	0.0005	*		
11	Sorting specific information	3.70	1.35	4.34	0.99	4.00	0.77	0.0000	*		
12	Calculating in databases	3.40	1.38	4.01	1.13	3.62	0.80	0.0002	*		
13	Relationing among databases	3.54	1.39	4.07	1.10	3.33	0.80	0.0006	*		
14	Generating reports	3.43	1.35	3.99	1.09	3.62	0.74	0.0005	*		
15	Creating a spreadsheet	3.47	1.35	3.89	0.95	3.81	0.75	0.0079	*		
16	Using formulae in worksheets	3.48	1.4	3.84	0.99	3.43	0.93	0.0299			
17	Using functions in worksheets	3.19	1.4	3.73	1.08	3.19	0.87	0.0009	*		
18	Building graphs in worksheets	3.20	1.32	3.61	1.11	3.25	0.79	0.0135	*		
19	Customizing worksheets	3.41	1.4	4.00	1.03	3.70	0.86	0.0003	*		
20	Creating and editing documents	3.40	1.39	4.02	1.00	3.95	0.69	0.0000	*		
21	Formatting documents	3.53	1.38	4.16	0.97	4.20	0.70	0.0000	*		
22	Designing publications	3.46	1.36	3.83	1.15	3.85	0.75	0.0271			
23	Merging mail	3.50	1.37	4.04	1.01	3.85	0.81	0.0006	*		
24	Document management	3.48	1.36	4.04	1.12	3.90	0.72	0.0004	*		
25	Electronic mail	3.04	1.32	3.44	1.25	3.15	0.88	0.0250	*		
26	Voice mail	2.89	1.19	3.19	1.16	3.25	0.91	0.0554			
27	Computer facsimile	3.04	1.25	3.49	1.23	3.70	0.57	0.0014	*		
28	Access database via modems	3.12	1.36	3.53	1.26	3.50	1.00	0.0201	*		
29	Connecting other computers	2.98	1.25	3.30	1.24	3.14	0.96	0.0666			
30	Administrative processing	3.21	1.32	3.69	1.27	4.19	0.75	0.0001	*		*
31	Creating text presentations	3.36	1.36	3.99	1.09	3.90	0.77	0.0000	*		
32	Creating graphic presentations	3.24	1.29	3.87	1.12	3.86	0.85	0.0000	*		
33	Creating multimedia programs	3.26	1.33	3.75	1.26	3.52	0.75	0.0038	*		
34	One-on-one computer presentations	3.38	1.34	3.85	1.90	3.81	0.75	0.0031	*		
35	Using projection devices	3.21	1.3	3.75	1.19	3.76	1.00	0.0004	*		
36	Automatic presentation program	2.97	1.35	3.58	1.28	3.38	0.74	0.0002	*		
37	Tutorial training	3.26	1.32	3.70	1.11	3.90	0.89	0.0021	*		
38	Drill training	3.25	1.38	3.67	1.08	3.86	0.85	0.0046	*		
39	Simulation training	3.16	1.33	3.49	1.10	3.48	0.98	0.0483			
40	Testing	3.07	1.24	3.34	1.17	4.05	0.59	0.0008			*
41	Distance learning	3.07	1.33	3.15	1.31	3.24	1.00	0.7709			
42	Expert consulting system	3.27	1.3	3.52	1.30	3.43	0.93	0.2383			
43	Customized proposal	3.66	1.39	3.89	1.08	4.05	0.83	0.1671			
44	Sales activities guide	3.55	1.36	3.88	1.08	3.71	1.01	0.0775			
45	Self-diagnosis analysis	3.51	1.35	3.91	1.12	3.67	1.02	0.0249	*		
46	Underwriting feasibility	3.28	1.36	3.46	1.26	4.29	0.72	0.0030		*	*
47	Approaching techniques	3.31	1.4	3.52	1.15	3.62	0.74	0.2543			
48	Computer games	3.01	1.3	3.02	1.10	3.10	0.83	0.9579			
49	Voice & handwriting recognition	3.13	1.38	3.34	1.24	3.48	0.81	0.2546			

Appendix G

Present Level of Agent Expertise of Identified Computer Skills

Appendix G
The Present Level of Agent Expertise of Identified Computer Skills

No.	COMPUTER SKILLS	Grand M.	Ran.	Agent	Ran.	Sales Mgr	Ran.	Com. Dir.	Ran.
3	Keyboarding and data entry	3.14	1	3.13	1	3.13	5	3.24	1
21	Formatting documents	3.10	2	2.87	4	3.48	1	3.20	2
11	Sorting specific information	3.05	3	2.93	2	3.33	2	2.52	14
20	Creating and editing documents	2.93	4	2.77	8	3.21	3	2.95	3
2	Basic software concepts	2.93	5	2.93	3	2.95	14	2.76	6
1	Basic hardware concepts	2.91	6	2.81	7	3.10	6	2.76	5
10	Designing databases	2.89	7	2.82	5	3.07	8	2.57	11
15	Creating a spreadsheet	2.88	8	2.70	9	3.18	4	2.90	4
9	Self-directed learning	2.82	9	2.82	6	2.89	16	2.43	20
23	Merging mail	2.78	10	2.70	10	2.97	12	2.55	13
19	Customizing worksheets	2.76	11	2.63	15	2.98	10	2.70	9
14	Generating reports	2.76	12	2.64	13	3.01	9	2.43	17
24	Document management	2.74	13	2.55	18	3.08	7	2.65	10
16	Using formulae in worksheets	2.74	14	2.62	17	2.97	13	2.57	12
13	Relationing among databases	2.74	15	2.63	16	2.98	11	2.43	18
22	Designing publications	2.71	16	2.65	12	2.80	17	2.75	8
12	Calculating in databases	2.68	17	2.55	19	2.95	15	2.43	19
4	Use of operating systems	2.67	18	2.64	14	2.79	18	2.24	29
43	Customized proposal	2.64	19	2.66	11	2.77	19	2.20	32
17	Using functions in worksheets	2.48	20	2.41	24	2.63	21	2.24	30
6	Writing macros	2.46	21	2.47	20	2.54	25	1.95	41
44	Sales activities guide	2.45	22	2.45	22	2.54	26	2.00	39
18	Building graphs in worksheets	2.45	23	2.38	25	2.58	23	2.30	25
31	Creating text presentations	2.43	24	2.24	29	2.75	20	2.48	15
8	Software maintenance	2.43	25	2.46	21	2.40	31	2.33	24
47	Approaching techniques	2.41	26	2.33	27	2.49	30	2.76	7
45	Self-diagnosis analysis	2.40	27	2.38	26	2.50	28	2.05	36
5	Programming	2.39	28	2.45	23	2.37	32	1.86	44
34	One-on-one computer presentations	2.37	29	2.24	30	2.57	24	2.48	16
37	Tutorial training	2.33	30	2.23	31	2.50	29	2.33	23
32	Creating graphic presentations	2.33	31	2.17	34	2.60	22	2.43	21
38	Drill training	2.32	32	2.21	32	2.51	27	2.33	22
7	Hardware maintenance	2.27	33	2.31	28	2.20	36	2.29	26
46	Underwriting feasibility	2.18	34	2.21	33	2.12	40	2.19	35
39	Simulation training	2.16	35	2.10	37	2.30	34	1.95	42
30	Administrative processing	2.15	36	2.05	39	2.30	35	2.19	34
48	Computer games	2.14	37	2.17	35	2.07	42	2.29	27
33	Creating multimedia programs	2.13	38	2.03	40	2.31	33	2.05	37
40	Testing	2.11	39	2.13	36	2.06	44	2.29	28
42	Expert consulting system	2.10	40	2.09	38	2.17	38	1.80	47
35	Using projection devices	2.04	41	1.94	45	2.19	37	2.24	31
27	Computer facsimile	2.03	42	1.99	42	2.09	41	2.20	33
28	Access database via modems	2.01	43	1.96	44	2.13	39	1.80	48
29	Connecting other computers	2.00	44	1.98	43	2.06	45	1.90	43
25	Electronic mail	1.98	45	1.94	46	2.06	46	2.00	40
49	Voice & handwriting recognition	1.96	46	2.00	41	1.91	47	1.86	45
36	Automatic presentation program	1.93	47	1.83	48	2.07	43	2.05	38
41	Distance learning	1.88	48	1.91	47	1.84	49	1.71	49
26	Voice mail	1.85	49	1.81	49	1.91	48	1.85	46

Appendix H

Significant Differences of Perceived Agent Expertise

Appendix H
Significant Differences of Perceived Agent Expertise

No	Important Computer Skills	Agent		Sales Mgr.		Com. Dir.		F	Sig. Dif.		
		M	S.D.	M	S.D.	M	S.D.	Prob.	A-M	M-D	D-A
1	Basic hardware concepts	2.81	1.19	3.10	0.88	2.76	1.04	0.0544			
2	Basic software concepts	2.93	1.20	2.95	0.96	2.76	1.04	0.7723			
3	Keyboarding and data entry	3.13	1.27	3.13	0.98	3.24	1.09	0.9159			
4	Use of operating systems	2.64	1.18	2.79	1.05	2.24	0.83	0.1039			
5	Programming	2.45	1.19	2.37	1.19	1.86	0.79	0.0831			
6	Writing macros	2.47	1.07	2.54	1.20	1.95	0.97	0.0827			
7	Hardware maintenance	2.31	1.17	2.20	1.13	2.29	0.90	0.7152			
8	Software maintenance	2.46	1.21	2.40	1.21	2.33	0.91	0.8513			
9	Self-directed learning	2.82	1.16	2.89	1.17	2.43	0.81	0.2439			
10	Designing databases	2.82	1.31	3.07	1.19	2.57	0.93	0.1005			
11	Sorting specific information	2.93	1.39	3.33	1.25	2.52	0.81	0.0056	*	*	
12	Calculating in databases	2.55	1.32	2.95	1.34	2.43	0.68	0.0166	*		
13	Relationing among databases	2.63	1.34	2.98	1.35	2.43	0.87	0.0428			
14	Generating reports	2.64	1.34	3.01	1.35	2.43	0.87	0.0287			
15	Creating a spreadsheet	2.70	1.28	3.18	1.15	2.90	0.94	0.0031	*		
16	Using formulae in worksheets	2.62	1.39	2.97	1.23	2.57	0.87	0.0613			
17	Using functions in worksheets	2.41	1.31	2.63	1.27	2.24	0.89	0.2242			
18	Building graphs in worksheets	2.38	1.28	2.58	1.24	2.30	0.98	0.3335			
19	Customizing worksheets	2.63	1.32	2.98	1.34	2.70	1.08	0.0631			
20	Creating and editing documents	2.77	1.33	3.21	1.32	2.95	0.76	0.0114	*		
21	Formatting documents	2.87	1.36	3.48	1.25	3.20	0.95	0.0003	*		
22	Designing publications	2.65	1.35	2.80	1.24	2.75	0.91	0.6010			
23	Merging mail	2.70	1.38	2.97	1.32	2.55	0.89	0.1476			
24	Document management	2.55	1.31	3.08	1.36	2.65	0.99	0.0026	*		
25	Electronic mail	1.94	1.07	2.06	1.19	2.00	0.73	0.6269			
26	Voice mail	1.81	1.00	1.91	1.15	1.85	0.88	0.7403			
27	Computer facsimile	1.99	1.13	2.09	1.34	2.20	0.89	0.6085			
28	Access database via modems	1.96	1.19	2.13	1.43	1.80	0.89	0.3532			
29	Connecting other computers	1.98	1.04	2.06	1.31	1.90	0.89	0.7710			
30	Administrative processing	2.05	1.67	2.30	1.48	2.19	1.08	0.2491			
31	Creating text presentations	2.24	1.14	2.75	1.37	2.48	0.98	0.0016	*		
32	Creating graphic presentations	2.17	1.10	2.60	1.34	2.43	1.03	0.0062	*		
33	Creating multimedia programs	2.03	1.08	2.31	1.34	2.05	0.97	0.1124			
34	One-on-one computer presentations	2.24	1.17	2.57	1.43	2.48	1.17	0.0707			
35	Using projection devices	1.94	1.14	2.19	1.32	2.24	1.30	0.1461			
36	Automatic presentation program	1.83	1.01	2.07	1.26	2.05	1.02	0.1647			
37	Tutorial training	2.23	1.13	2.50	1.17	2.33	1.15	0.1298			
38	Drill training	2.21	1.23	2.51	1.28	2.33	1.39	0.1250			
39	Simulation training	2.10	1.14	2.30	1.25	1.95	1.24	0.2344			
40	Testing	2.13	1.18	2.06	1.21	2.29	1.23	0.6866			
41	Distance learning	1.91	1.12	1.84	1.20	1.71	1.06	0.6974			
42	Expert consulting system	2.09	1.19	2.17	1.31	1.80	1.24	0.4436			
43	Customized proposal	2.66	1.35	2.77	1.41	2.20	1.32	0.1971			
44	Sales activities guide	2.45	1.37	2.54	1.34	2.00	1.14	0.2423			
45	Self-diagnosis analysis	2.38	1.25	2.50	1.29	2.05	1.16	0.2865			
46	Underwriting feasibility	2.21	1.17	2.12	1.26	2.19	1.12	0.8307			
47	Approaching techniques	2.33	1.23	2.49	1.25	2.76	1.14	0.2127			
48	Computer games	2.17	1.25	2.07	1.11	2.29	0.90	0.6298			
49	Voice & handwriting recognition	2.00	1.2	1.91	1.11	1.86	1.24	0.7521			

Appendix I

Differences Between the Importance Level and the Level of Expertise

Appendix I

Differences Between the Importance Level and the Level of Expertise

Important Computer Skills	No	Grand Mean			Agents			Sales Managers			Computer Dir.		
		Imp.	Exp.	I-E	Imp.	Exp.	I-E	Imp.	Exp.	I-E	Imp.	Exp.	I-E
Basic hardware concepts	1	3.30	2.91	0.39	3.16	2.81	0.35	3.56	3.10	0.46	3.29	2.76	0.53
Basic software concepts	2	3.44	2.93	0.51	3.35	2.93	0.42	3.62	2.95	0.67	3.29	2.76	0.53
Keyboarding and data entry	3	3.58	3.14	0.44	3.40	3.13	0.27	3.83	3.13	0.70	3.86	3.24	0.62
Use of operating systems	4	3.28	2.67	0.61	3.20	2.64	0.56	3.53	2.79	0.74	2.62	2.24	0.38
Programming	5	2.98	2.39	0.59	2.93	2.45	0.48	3.19	2.37	0.82	2.33	1.86	0.47
Writing macros	6	3.26	2.46	0.80	3.23	2.47	0.76	3.46	2.54	0.92	2.40	1.95	0.45
Hardware maintenance	7	3.11	2.27	0.84	3.12	2.31	0.81	3.09	2.20	0.89	3.19	2.29	0.90
Software maintenance	8	3.25	2.43	0.82	3.20	2.46	0.74	3.37	2.40	0.97	3.05	2.33	0.72
Self-directed learning	9	3.35	2.82	0.53	3.23	2.82	0.41	3.58	2.89	0.69	3.19	2.43	0.76
Designing databases	10	3.81	2.89	0.92	3.61	2.82	0.79	4.16	3.07	1.09	3.75	2.57	1.18
Sorting specific information	11	3.94	3.05	0.89	3.70	2.93	0.77	4.34	3.33	1.01	4.00	2.52	1.48
Calculating in databases	12	3.63	2.68	0.95	3.40	2.55	0.85	4.01	2.95	1.06	3.62	2.43	1.19
Relationing among databases	13	3.71	2.74	0.97	3.54	2.63	0.91	4.07	2.98	1.09	3.33	2.43	0.90
Generating reports	14	3.64	2.76	0.88	3.43	2.64	0.79	3.99	3.01	0.98	3.62	2.43	1.19
Creating a spreadsheet	15	3.64	2.88	0.76	3.47	2.70	0.77	3.89	3.18	0.71	3.81	2.90	0.91
Using formulae in worksheets	16	3.60	2.74	0.86	3.48	2.62	0.86	3.84	2.97	0.87	3.43	2.57	0.86
Using functions in worksheets	17	3.38	2.48	0.90	3.19	2.41	0.78	3.73	2.63	1.10	3.19	2.24	0.95
Building graphs in worksheets	18	3.35	2.45	0.90	3.20	2.38	0.82	3.61	2.58	1.03	3.25	2.30	0.95
Customizing worksheets	19	3.64	2.76	0.88	3.41	2.63	0.78	4.00	2.98	1.02	3.70	2.70	1.00
Creating and editing documents	20	3.65	2.93	0.72	3.40	2.77	0.63	4.02	3.21	0.81	3.95	2.95	1.00
Formatting documents	21	3.79	3.10	0.69	3.53	2.87	0.66	4.16	3.48	0.68	4.20	3.20	1.00
Designing publications	22	3.62	2.71	0.91	3.46	2.65	0.81	3.83	2.80	1.03	3.85	2.75	1.10
Merging mail	23	3.71	2.78	0.93	3.50	2.70	0.80	4.04	2.97	1.07	3.85	2.55	1.30
Document management	24	3.70	2.74	0.96	3.48	2.55	0.93	4.04	3.08	0.96	3.90	2.65	1.25
Electronic mail	25	3.19	1.98	1.21	3.04	1.94	1.10	3.44	2.06	1.38	3.15	2.00	1.15
Voice mail	26	3.02	1.85	1.17	2.89	1.81	1.08	3.19	1.91	1.28	3.25	1.85	1.40
Computer facsimile	27	3.23	2.03	1.20	3.04	1.99	1.05	3.49	2.09	1.40	3.70	2.20	1.50
Access database via modems	28	3.29	2.01	1.28	3.12	1.96	1.16	3.53	2.13	1.40	3.50	1.80	1.70
Connecting other computers	29	3.10	2.00	1.10	2.98	1.98	1.00	3.30	2.06	1.24	3.14	1.90	1.24
Administrative processing	30	3.44	2.15	1.29	3.21	2.05	1.16	3.69	2.30	1.39	4.19	2.19	2.00
Creating text presentations	31	3.61	2.43	1.18	3.36	2.24	1.12	3.99	2.75	1.24	3.90	2.48	1.42
Creating graphic presentations	32	3.50	2.33	1.17	3.24	2.17	1.07	3.87	2.60	1.27	3.86	2.43	1.43
Creating multimedia programs	33	3.45	2.13	1.32	3.26	2.03	1.23	3.75	2.31	1.44	3.52	2.05	1.47
One-on-one computer presentations	34	3.57	2.37	1.20	3.38	2.24	1.14	3.85	2.57	1.28	3.81	2.48	1.33
Using projection devices	35	3.43	2.04	1.39	3.21	1.94	1.27	3.75	2.19	1.56	3.76	2.24	1.52
Automatic presentation program	36	3.20	1.93	1.27	2.97	1.83	1.14	3.58	2.07	1.51	3.38	2.05	1.33
Tutorial training	37	3.45	2.33	1.12	3.26	2.23	1.03	3.70	2.50	1.20	3.90	2.33	1.57
Drill training	38	3.44	2.32	1.12	3.25	2.21	1.04	3.67	2.51	1.16	3.86	2.33	1.53
Simulation training	39	3.29	2.16	1.13	3.16	2.10	1.06	3.49	2.30	1.19	3.48	1.95	1.53
Testing	40	3.23	2.11	1.12	3.07	2.13	0.94	3.34	2.06	1.28	4.05	2.29	1.76
Distance learning	41	3.11	1.88	1.23	3.07	1.91	1.16	3.15	1.84	1.31	3.24	1.71	1.53
Expert consulting system	42	3.37	2.10	1.27	3.27	2.09	1.18	3.52	2.17	1.35	3.43	1.80	1.63
Customized proposal	43	3.77	2.64	1.13	3.66	2.66	1.00	3.89	2.77	1.12	4.05	2.20	1.85
Sales activities guide	44	3.67	2.45	1.22	3.55	2.45	1.10	3.88	2.54	1.34	3.71	2.00	1.71
Self-diagnosis analysis	45	3.66	2.40	1.26	3.51	2.38	1.13	3.91	2.50	1.41	3.67	2.05	1.62
Underwriting feasibility	46	3.41	2.18	1.23	3.28	2.21	1.07	3.46	2.12	1.34	4.29	2.19	2.10
Approaching techniques	47	3.40	2.41	0.99	3.31	2.33	0.98	3.52	2.49	1.03	3.62	2.76	0.86
Computer games	48	3.02	2.14	0.88	3.01	2.17	0.84	3.02	2.07	0.95	3.10	2.29	0.81
Voice & handwriting recognition	49	3.22	1.96	1.26	3.13	2.00	1.13	3.34	1.91	1.43	3.48	1.86	1.62