

EDUCATION FOR ACCOUNTANTS WITH COMPUTER EMPHASIS

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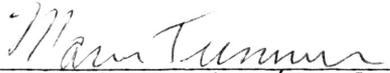
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ABSTRACT

Computers have become an integral part of accounting practice but have been ignored in the area of accounting education. This study proposes to determine the feeling of the accounting profession in both the public and private applications and the academic attitude toward an accounting program which integrates the areas of accounting and computer science into one alternative program for interested students. A questionnaire study was implemented by sending questionnaires to Texas universities, CPA partnerships and manufacturing firms. The questionnaire included questions pertaining to the current programs, student demand for these programs, and opinions of the proposed program within the university and personnel training and competence, system needs and problems, and the feeling toward the proposed program by CPA partnerships and manufacturing firms.

An overall response rate of 31% was achieved in a response time of one month. The responses indicated a very conservative attitude toward the program by academicians and a more favorable attitude by the manufacturing industry. The results did not conclusively determine that a definite need was felt in the two populations for an accounting program with computer emphasis but did produce the evidence required to justify further research into the area. This evidence consisted of a high response rate and high interest level among the respondents. Recommendations for implementation of the program and for future research were also brought out by the responses.

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TABLE OF CONTENTS

	Page
INTRODUCTION.....	1
Purpose.....	1
Description of Program.....	1
Scope and Design.....	2
DESIGN.....	3
Sample Formation.....	3
Questionnaire Design.....	5
Pilot Study.....	8
Questionnaire Redesign.....	9
Mailing.....	10
ANALYSIS.....	12
University Questionnaire.....	12
Background Response.....	12
Implementation Response.....	13
Need Responses.....	14
Comparative Analysis.....	15
CPA-Manufacturing Questionnaire.....	16
Background Responses.....	17
Personnel Responses.....	17
Training Program Responses.....	19
Implementation Responses.....	20
Need Responses.....	20
CONCLUSIONS.....	22
Need.....	22
Future Research.....	26
RECOMMENDATIONS.....	27
Implementation.....	27
Future Research.....	27
BIBLIOGRAPHY.....	30
APPENDIX A.....	31
APPENDIX B.....	38
APPENDIX C.....	46
APPENDIX D.....	52
VITA.....	56

Computers have affected every aspect of business today and accounting is no exception. Two new methods of auditing, auditing around and through the computer, have arisen through the use of computer accounting systems. New areas of accounting management services are now centered on advising the client as to which computer system is best for him. The vast amount of accounting data and records which were once written out on pages and pages of journal paper are now held in disk or tape storage in a computer library for easy access when needed.

Purpose

One area of accounting that has escaped or avoided being affected by the computer revolution, however, is the area of accounting education. In most university accounting programs only one course in introductory business data processing is required. Thus, most computer training which is required of accountants is received through firm training programs or simply by first hand experience. It is thus the purpose of this research study to determine if a need for an accounting program with computer emphasis within the university is felt necessary by the accounting profession and users of this profession.

Description of Program

This proposed program would emphasize the basic accounting principles and courses currently being taught by educators, but would also

This research project follows the style suggested by The Accounting Review.

emphasize the effect of computer usage in each. This emphasis would include instruction as to the various ways the computer could aid the accountant in his statistical analysis and complex mathematical calculations. It would also include applications and modifications of the accounting principles as applied to computer accounting systems. Another main application would be the study of developing computer accounting systems and the feasibility, security, legal, and documentary aspects which must be stressed. All in all the program would be an extension of current programs with emphasis placed on computer usage.

Scope and Design

Since very little research has been done in this area, this particular study was designed as a pilot test to determine if the need for a program such as the above was felt by the business world and if further research into the area could be justified. The questionnaire method of research was used to elicit information leading to the determination of both of the objectives. The results in no way are intended to be conclusive since a narrow population with a small sample was used. However, the results do present a general overview of the feeling toward an accounting program with computer emphasis within the area researched and may be indicative of results in other population areas.

With this explanation a detailed report of the study will follow beginning with the design of the study and specifically of the questionnaire and moving into the analysis and conclusions reached through the research study.

DESIGN

Sample Formation

In starting this research the first decision to be made was the choosing of a sample. Because of financial and time restrictions the samples were chosen only from the state of Texas. This also gave the advantage that more of the sample would be familiar enough with Texas A&M University to be willing to respond. From here the decision was made to have two separate samples. One was made up of Texas universities and the other of Texas CPA partnerships and manufacturing firms. Two samples were chosen mainly because different kinds of information were required from each. From the universities information as to existing programs and courses within the accounting departments was needed in addition to whether they felt the computer accounting program would be useful or not. Only four year universities were chosen because most of these would be sure to have an accounting department within the business school whereas colleges and junior colleges might not be as likely to have such a department. The sample still included various size universities in various regions of Texas so that a true representation could be obtained.

The sample taken from CPA partnerships and manufacturing firms was chosen to elicit information as to the extent of computer use and the need for personnel by each. Problem areas and weaknesses in their personnel were also requested as well as their opinion as to the usefulness of the proposed program. CPA partnerships were chosen rather than individual CPA's to insure that the recipient would be in

actual accounting practice. Since many CPA's are lawyers or participate in areas other than accounting, the partnerships were chosen. Manufacturing firms were chosen as opposed to other businesses because of their abundance and usual large size. Other areas could have worked as well, but for convenience and financial limitations manufacturers were chosen.

The actual samples from each of these populations were chosen in various ways. The Texas universities were chosen from a list of Universities, colleges and junior colleges from the United States listed by state. This list is used for cataloging purposed by the Texas A&M University Library. The sample chosen from the Texas listing consisted of all the four-year universities which totaled thirty-seven in all. Since the total number was relatively small, no random sampling was done and all were included.

The sample of CPA's and manufacturers was chosen by random sampling. The total sample was limited to 100 because of financial reasons. The CPA partnerships were obtained from the Texas State Board of Public Accountancy Roster. The manufacturing firms were obtained from the 1976 Directory of Texas Manufacturers Vol I (Texas State Board of Public Accountancy, 1974, 369-82); (Bureau of Business Research, 1976, 407-51). These two categories were numbered beginning with the CPA partnerships consecutively into the manufacturing firms. The total number of the two categories was 2,329. By using the Rand Table of Random Digits, the sample was taken using four digit numbers and going down by columns. This selection was taken from page 131 starting with the first column of random digits. A list of these samples may be

found in Appendix A (Rand Corporation, 1955, 131).

Questionnaire Design

Once the sample was chosen the next step was to design the questionnaire. The first decision here was what kind of information was needed to analyze the hypotheses that a combined accounting-data processing academic program was needed. For the university questionnaire it was decided that four main categories of questions were needed. First the category of background was chosen. This category aided in making comparison of responses and determining the composition of the responding sample. In the original questionnaire there were ten questions concerning background which consisted of size of enrollment of the university, Business College, and Accounting Department; the type of accounting programs offered, the type data processing courses required by their programs and the type data processing courses available for electives.

The second category of information needed was that pertaining to the demand by students for courses dealing with the data processing areas. These questions were aimed at the elective hours since most programs require at least three hours of data processing. This category consisted of only one question in the original and final questionnaire. Nevertheless, it was an important category since most of the opposition by academicians to such a program stemmed from lack of demand by students.

Another information category required in the questionnaire was that of agreement or disagreement as to the need for the combined pro-

gram. This category consisted of two questions in the initial and final questionnaire. One question pertained to the feeling of a need for such a program and the second pertained to the respondent's interest in incorporating such a program into the present university system. This category was the key category for determining the opinion of the university toward an accounting program with computer emphasis.

The final category to be considered for the questionnaire was that of information regarding the implementation of such a program. In the original questionnaire were four questions falling into this category. The questions pertained to the demand foreseen of industry for these students, the level at which the program should be incorporated and the type lab facilities which should be used. These questions would be very important for designing the program if proof of the hypotheses was made.

The questionnaire for the CPA partnerships and manufacturers had five main information categories. The first category again was background of the particular firm. This category included questions pertaining to their dependence upon data processing, the number of personnel within their computer accounting department and the educational background of each of these personnel. The original questionnaire had seven questions in this area. Again, this category was required primarily for comparative and composition analysis.

The second category of questions dealt with the satisfaction of the firm with the training of these personnel. In both the original and final questionnaire this area consisted of only one question. Nevertheless, the category was of importance in determining the overall

feel for the need of a combined program.

Another category required by the questionnaire was that of information as to in-house training programs of the particular CPA or manufacturing firm. Six questions were in the original questionnaire pertaining to this category. These included the length of the program, who taught the program, the type of training taught and the experience required of an applicant to the program. This information was required to get a feel as to what was currently being done for training of personnel and secondarily to aid in implementing a program if the need for one was found to exist.

The fourth category was the beneficial or not beneficial category. The original and final questionnaire contained three questions pertaining to this area. These included information as to whether the firm thought an academic program of this type would be beneficial or not, if the firm would be willing to support such a program and what kind of future demand the firm would have for accountants trained in the computer area. This category of questions was used as the prime determinant for analyzing the opinion of the particular firm as to the proposed academic program.

The final category of the CPA-manufacturing questionnaire pertained to information for implementation of the program if such a decision was made. Nine questions were in the original questionnaire dealing with this area. The information requested included the problem areas of the firm's computer system, the weaknesses of the firm's personnel, the hardware and software used by the firm, and various aspects of the firm's data processing system. This information would be very important

in designing the curriculum for this particular program.

The original form of this questionnaire was built on a scale from 0 to 4 with various values or opinions attached to each scale number.

An example of this form is as follows:

0	1	2	3	4
totally independent	slightly dependent	moderately dependent	very dependent	totally dependent
0	1	2	3	4
none	1-10	11-20	21-30	31 or more

In this form the university questionnaire consisted of eighteen questions and the CPA-manufacturing questionnaire consisted of 27 questions.

Pilot Study

With these questions a pilot study within Texas A&M University was run. The questionnaire was sent to four different professors from the areas of psychology, data processing, and accounting. This pilot study was not intended for analytic purposes, but mainly for evaluation of the questionnaire itself. The different areas participating in this test were chosen for various reasons. Psychology was chosen to prevent the questions from biasing the respondent instead of illiciting a true response. This area was also used to improve the scale, value ranges and wording. The data processing and accounting areas were included to improve the clarity of the questions. These two areas were representative of both types of respondents which would likely be encountered. From the suggestions of these people improvements and changes were made to develop the final form of the questionnaire.

Questionnaire Redesign

After modifying, cutting, and rescaling, the final versions of the questionnaires were reached. The scaling of the questions was changed quite drastically. Instead of only using the scaled questions many fill in and yes-no questions were formed. This provided more exact answers where numerical information was concerned. It also made the questionnaire easier to answer. At the suggestion of the pilot test the scaled questions were changed from 0-4 to 1-5. It was felt that the 0 gave negative impressions and was also not as easily adapted to computer analysis if required.

It was also decided by suggestion that fill-in blanks should be added to the scaled question to elicit additional responses. It was felt that being a pilot test, the study would be more informative for later research if the respondent was free to make additional comments. This feature, however, also made analysis of the answers more difficult and ruled out strict statistical analysis of the questions. For these reasons only descriptive analysis was done on the data.

For financial and simplification reasons the number of questions were also cut. The university questionnaire was reduced from the original 18 questions to only 9 questions. The CPA-manufacturing questionnaire was reduced from 27 to 15 questions. Financially the reduction in questions also reduced the postage and printing costs of the study. More importantly, however, it also increased the ease with which the questionnaire could be answered. This is most important in obtaining a high response rate.

Finally, with the completion of the questionnaire the introductory letter and instructions had to be formulated. The letter served as an interest rouser and as an introduction to the study and researcher. The instructions served to explain the procedure for filling out the questionnaire. Basically they consisted of circling the most appropriate choice or filling in the closest approximation to questions requiring a numerical response. The instructions went on to emphasize that the respondent feel free to add any comments which he might feel were needed. The respondent was also allowed to disregard any question that he did not care to answer and to circle multiple answers where he felt they were applicable. These additional instructions were primarily to prevent the feeling of liability to questions such as those requesting participation in the program or support for the program. They were also used to encourage the additional fill-in information. (Copies of the questionnaires and introductory material may be found in Appendix B.)

Mailing

With all aspects of the questionnaire completed they were mailed in mid-December. Thus, the first semester's work consisted of completing the questionnaire. One-hundred thirty-nine letters were mailed with return envelopes included. This was another factor which hopefully would add to the response rate. To keep track of each questionnaire and its respondent, the return envelope and questionnaire were numbered with a number corresponding to the appropriate university or firm from the sample.

The university questionnaires were addressed to the attention of the department head of the Accounting Department. The CPA firm questionnaires were sent to the attention of a partner and the manufacturer questionnaires were sent to the attention of the accounting supervisor. These positions were chosen in hope that they would be the best qualified to answer the questions or would pass it on to someone who was better qualified.

Even though Texas manufacturing firms were chosen it was decided to send the questionnaire to the firm's main headquarters. Thus, the questionnaires were sent to many different states including Ohio and California, as well as Texas. This was done to insure that the questionnaire would reach the accounting headquarters. Many of the firms within Texas were merely plants of a nationwide firm and therefore the accounting headquarters were not necessarily located within Texas. With the mailing of the questionnaires the first phase of the study was complete.

ANALYSIS

The second phase of the research project consisted of collecting the responses and analyzing the results. The questionnaires were mailed out around December 15, 1976 and the majority of the responses were in by January 15, 1977. The response time of one month may have been caused by the holiday season and vacations during this time. Forty-two responses consisting of twenty-seven CPA and manufacturers and fifteen university responses were collected in all. A list of these questions and responses maybe found in Appendix C. Two of the twenty-seven CPA-manufacturer responses were from CPA's with the remaining 25 coming from manufacturing firms. This produced a 27% response rate among CPA and manufacturers and a 40.5% response rate among universities. The high rate of responses from academicians was probably due to familiarity with Texas A&M University and their high interest in research.

University Questionnaire

Background Response. The university questionnaire produced very neutral results as to the benefit derived from a separate accounting program for students interested in the computer area. The average size of the schools responding was around 11,610 and ranged from 1,500 to 40,000. The average size of the business schools within the universities consisted of 2,244 students and ranged from 220 to 4,100. The enrollment within the accounting departments averaged around 695 students and ranged from 25 to 1,500. From the instructions it must

felt that these are only rough estimates.

Out of the 15 schools which responded only three indicated that they already had a program such as the one proposed. In looking further into these responses it was found that only one had a program comparable to the one proposed. The other two merely had management degrees with computer emphasis and stressed only the introductory accounting courses. The other program was extensive in accounting and offered several courses with computer emphasis, but lacked the complete integration between the two. This degree plan, however, would be beneficial in planning the proposed program.

Implementation Response. Out of the 15 responses to the university questionnaire 13 schools had optional or required courses in the computer area available to accounting majors. The other two responses were non-responses and in all probability 100% of the schools had such courses. In questioning the demand for these courses, eight out of the fifteen reported that moderate demand for these courses was found among their students. Three stated very little demand, three very great demand and one gave no response to the question. Thus, the majority responded with a moderate demand for the courses which kept with the neutrality of the overall university response.

When questioned as to what educational level a program such as the proposed should be introduced, three levels were equally chosen. Five responses listed the undergraduate freshman and upper level whereas six responded to each the junior level and graduate master's program level. Three non-responses were found with this question also. With the equal distribution among the levels a conclusion as to the best

level was hard to reach. Further investigation would probably clarify the issue.

Need Responses. The final two questions within the university questionnaire represent the crux of the issue being researched. In both the manufacturing-CPA and the university questionnaires comparable questions were asked which indicated the true feeling of the respondent toward the program. The first of these questions within the university questionnaire dealt with whether the respondent would be in agreement with the need for an accounting program with computer emphasis. The responses were distributed more evenly in this question also and included five non-responses. The largest number of responses were four which stated that they would be in slight agreement with the need for such a program. Two responded with total disagreement, three with moderate agreement and one with total agreement. Thus, the majority of the responses lay from slight to moderate agreement with the need for a computer accounting program. This again fits with the overall neutral response of the university sample.

The final question, which also dealt with the critical class of questions, pertained to the interest of the respondent in incorporating the proposed accounting program into their existing curriculum. This question also received five non-responses and tended to be equally distributed, but leaned in a more favorable direction. Out of the ten responses, one responded as already having such a program and one responded as not interested at all. The categories of slightly interested and moderately interested both received two responses while the category of very interested received a total of four responses. Thus,

this question tended to stray from the overall neutral response attitude toward a more favorable attitude in regard to the separate accounting program with computer emphasis.

Comparative Analysis. In looking at the responses to these last two questions in relation to the size of the university not much correlation between size and favorableness toward this program could be found. The university sizes divided into four ranges; small, medium, medium large, and large. The small category was the largest category with 6 responses and ranged from 1,500 to 4,500. The medium category consisted of four responses ranging from 5,500 to 10,500. The medium large category consisted of 2 responses of 16,000 to 16,500 while the large category consisted of 3 responses ranging from 21,000 to 40,000 in enrollment. The most favorable group toward the program was the small category. Since this group contained the most responses in it, the favorableness may be caused simply by the greater number of responses. In response to the question as to agreement with the need for such a program, this group had one total agreement response, three moderate agreement responses, one slight agreement and one non-response. To the question as to interest in incorporating this type of program, this group contained two very interested responses, two moderate, one non-response and one which proclaimed to already have such a program. In the rest of the categories the responses were centered around slight and moderate interest or agreement. Quite a few non-responses and two total disagreement or not interested responses were also found in the other categories. Again, this comparison is not indicative as to the feeling of the different sizes of universities since the dispersion of

responses was so heavy in the small university category.

All in all the university questionnaire received a very neutral overall response from the Texas University sample. The neutrality may be attributed to many different reasons. One reason for the neutrality might have been the fact that one faculty member or department head was trying to answer the questionnaire to represent the overall feeling of the department toward a program such as the proposed. In review of most situations it would be probable that half the faculty would be for such a program and half against. This would tend to cause the response of moderate agreement in order to capture these differing views. Another reason might have been fear of being held accountable by other members of the department for the answers given if the results should ever be made public. Thus, the reasons are many for the moderate answers of the Texas universities. Moderate answers, however, do prove that an overall antagonistic feeling does not exist and that a favorable environment for further research could be developing.

CPA-Manufacturing Questionnaire

The overall environment of the CPA and manufacturing sample taken in this research project proved to be more favorable toward the accounting program with computer emphasis. Instead of the higher concentration of moderate answers as in the university questionnaire there were many more very interested or total agreement responses. The information regarding the implementation of the program also provided more concrete suggestions as to areas which would be emphasized in such a program.

Out of the 100 questionnaires sent to CPA and manufacturing establishments, twenty-seven responses were returned. Also of the 100 sent out, four were returned for lack of a forwardable address. Thus a little better than a 27% return rate was found. Also, out of the 27 returned nine had no computer use whatsoever within their firm. These respondents were very apologetic for not being able to help in the study, since they obviously could not respond to the questions asked. Thus, nine total non-response questionnaires were included in the 27% response rate. Since the number represented one-third of the total responses it proved to be quite a drawback. Thus in the analysis of this questionnaire these responses will be excluded from each question breakdown except for the first.

Background Responses. The first question of the CPA-manufacturer questionnaire dealt with the dependency of the firm's system of accounting upon computer use. As stated above, nine or one-third were totally independent of computer use. These firms were either too small to justify computer use or had their accounting done through a CPA or service-bureau type organization. Eight moderately dependent responses and seven totally dependent responses were received to this question. Three responses listed both moderate and total dependence. This group additionally responded that the different areas within their accounting system differed as to moderate or total dependency and thus both answers were chosen. Thus, the overall environment seemed to be made up of totally nondependent firms and substantially dependent firms.

Personnel Responses. Even though dependency was fairly uniform

throughout the firms questioned the number of computer accounting personnel and the education of these personnel differed greatly from firm to firm. The term computer accounting personnel was not accepted by many applicants and with due cause. However, for simplicity and for the lack of a proper title the term shall be referred to from time to time. The average number of computer accounting personnel was 16 and ranged from 1 to 100. The average number having a degree in accounting was 4 and ranged from 1 to 25. Out of these were 5 firms which stated that none of these personnel had a degree in accounting. This factor tended to bring down the average number. The average number of these personnel having a degree in computer science was 1.5 and ranged from 0 to 21. Out of these thirteen responded that none of their personnel had a degree in computer science or data processing. This greatly reduced the average number and thus indicated most of the computer accounting personnel were accounting graduates which must have been subsequently trained in the computer science area. The average number of these personnel with a combined degree of computer science or EDP and accounting was 0 and ranged from 0 to 3. Sixteen firms responded that none of their personnel were so trained while one firm responded as having one with such a degree, and one firm with three with such a degree. The response to the last question was not too surprising since the availability of these degrees is so limited.

Staying in the area of personnel the next question category dealt with the satisfaction and dissatisfaction of the firm with their computer accounting personnel or, as might seem more appropriate, their accounting personnel trained in the computer area. The largest group

of responses in this area was the slightly satisfied group which consisted of 6 responses. The distribution between the other categories was spread evenly with three responses in each of the slightly dissatisfied, neutral and totally satisfied groups with one response in the totally dissatisfied group. All in all the general opinion seemed to be less than completely satisfied.

Going along with this category was the question dealing with the weak educational areas found in the computer trained accountants. The area receiving the most responses was that of systems training which received 10 responses. The other two largest areas were programming and accounting principles each receiving 6 responses. In addition to these responses were four non-responses, one response of none, one response of math and several write-in answers. These write-in answers included such areas as communication skills and included the fact that their personnel tended to be strong in either accounting or EDP but not in both.

Training Program Responses. The next category of questions dealt with the individual training programs of the different firms. Out of the 27 respondents only four responded as having their own training programs. Out of these four, the length of the training programs ranged from two weeks to continuous training. Included in this range was two to eight weeks, six to eight weeks and six months to a year. Most of the training consisted of classroom and on the job training, with one response stating training by correspondence. In response to the type experience required of an applicant to the program, the responses were evenly distributed between a college degree, accounting

experience, and EDP experience. Only one respondent listed no requirements to the program. Thus, the training programs tended to be pretty much the same for all respondents.

Implementation Responses. The next category of questions dealt with the implementation aspect of the computer accounting program. The first question dealt with the areas of the firm's computer system which gave the most problems or required the most supervision. The majority of the responses were evenly distributed among the areas of systems, programming, and operating. One response indicated that security presented a major problem. Several write-in answers were also submitted to this question and included controls and programming as related to changing the current programs in operation.

Also, in this category was the question of how each of the firms foresaw their future need for computer accounting personnel. The greatest number of responses stated that they would be looking for an increasing number of these people in the future. The next largest group responded that they would be using the same number as they presently were or a slightly increasing number. One respondent stated they would be hiring a decreasing number of computer accounting personnel whereas another responded that not only an increasing number but a greatly increasing number of these people would be needed.

Need Responses. The last category of questions pertained to the main thrust of the research project. These questions dealt directly with whether the firm would be benefited by incorporating such a program into the present system and whether the firm would be willing to donate its cooperative, advisory or financial help to see that a

program for accountants interested in the computer area was started. In answer to the first question the largest number of responses stated that such a program would be very beneficial to their firm. The next largest group responded that the program would be moderately beneficial while two respondents each stated that such a program would not be beneficial or would be slightly beneficial. This question also received only one additional non-response to the nine from non-computerized firms.

In regard to the second question, as expected, responses were more conservative. Nine responses offered their cooperation to such a program through advice while one firm each offered limited and moderate financial support. In addition to these, three responses offered no support and six gave non-responses. Thus, all in all, the CPA-manufacturing questionnaire gave more favorable responses in that most of the responses lay in the moderately to very range instead of the slightly to moderately range.

CONCLUSIONS

Need

In conclusion to the results presented two questions will be dealt with. First of all the question of whether evidence from the responses indicate that a need for an accounting program with computer emphasis exists. The two questions from each questionnaire which deal with the need for and benefit derived from such a program best answer this first question. From the questionnaire sent to the universities, the largest response to the question dealing with agreement with the need for such a program was four responses stating they would be in slight agreement with the need for this program. Using a poisson table with a 95% confidence interval, these four responses indicate that out of the total population of Texas universities more than 4% and less than 25% would have responded as being in slight agreement. Further explanation of the poisson analysis may be found in Appendix D. The five non-responses to this question indicate that more than 5.4% and less than 29% would not have responded to the question. The three moderate agreement responses indicate that more than 2% but less than 21% of the population would have responded this way. Finally, taking the two extreme positions, the two responses stating total disagreement with such a program indicate that more than 1% but less than 17% of the population would also have totally disagreed. The one response of total agreement indicates that more than .1% and less than 13% would have totally agreed to the need for such a program.

This question presents a rather conservative view of the need and in itself could not be considered as proving the need exists. However, if all responses from slight agreement to total agreement are considered as giving proof of a need, this total of 8 responses indicates that more than 10.8% would be in some agreement with the need and less than 39% would be in agreement with a need. Looking at it this way, even though definite proof of a need does not exist, there is evidence of a substantial interest in the area.

This interest is indicated further by the responses to the question of interest in incorporating such a program into the university's present curriculum. Again, the five non-responses indicate that with 95% certainty more than 5.4% and less than 29% of the population would not have responded to the question. The four very interested responses indicate that more than 4% and less than 25% would have responded in this way. The one, not interested response indicates that more than .1% and less than 17% would not be interested in the program at all. Taking the total 9 responses which stated they were slightly interested to very interested the interval becomes more than 12.7% and less than 43% of the population that would be interested in incorporating such a program into their present curriculum.

Thus, the university questionnaire alone does not give indication that a definite need for an accounting program with computer emphasis is felt by academicians. Again, however, evidence does exist that a significant group of these people have some interest in the area which could develop the feeling of such a need as times goes by and the demand for these people steadily increases as the other questionnaire

indicates that it will.

The questionnaire to CPA-manufacturing firms indicates even more interest in the area of a computer accounting program as shown by the higher number of moderate to very answers given. Even though the percentages of this group will not be as high as in the university group, the results are more favorable because of the larger number included in the population. Twenty-seven percent of the 37 member population of universities would include only 9.99 universities while 27% of the CPA-manufacturing population of 2,329 would include 628.83 firms. Thus, the CPA-manufacturing group is considered the most favorable of the two populations.

Looking at the question dealing with whether the firm felt such a program would be beneficial to them or not, the 10 non-responses indicate that more than 5.4% and less than 17% would not have responded to the question. The 7 responses that such a program would be very beneficial to the firm indicates that with 95% certainty more than 4.7% and less than 16% would have responded in this way. Taking the 15 cumulative responses stating that the program would be slightly beneficial to very beneficial the interval becomes more than 9.2% and less than 23.4% of the population of Texas CPA's and manufacturers which would have felt the program to be beneficial to their firm.

In looking at the second question a less favorable connotation appears. Again the 15 non-responses indicate that more than 9.2% and less than 23.4% of the population would not have responded to the question. The 9 responses offering advice indicated that more than 4.7% and less than 16% would have offered advice. Cumulatively taking

the 11 responses offering any kind of support the interval becomes more than 6.2% and less than 18.3% of the population that would have offered support for such a program.

The cumulative look at the previous two questions presents a more favorable outlook toward the need for or benefit derived from the proposed program. However, these results still do not indicate that a definite feeling of need exists in the environment of CPA's and manufacturers. One of the main problems in analyzing this questionnaire was the 9 responses stating no computer use. Since these 9 responses indicate that more than 4.7% of the population and less than 16% of the population would not have computer use, it could be more informative to look at only the portion of the population with computer use. Using 10.35%, the mean percentage of 4.7% and 16%, and subtracting that percentage of the sample the analysis becomes more favorable and more informative in that it deals with only the portion of the sample which could respond with experience to the questions. Thus, the sample size becomes 90 and the cumulative response interval to the 15 beneficial responses becomes more than 10.2% and less than 26% of the population which would find the program beneficial to any degree. This would mean that at least 238 firms and at the most 605 firms within the state of Texas would feel that such a program would benefit them. As in the university situation the hypothesis that a definite need for an accounting program with computer emphasis exists must be rejected. However, the results show too substantial an interest in the area to say that no need exists.

Future Research

The second question which must be analyzed is that pertaining to the need for further research into the need for an accounting program with computer emphasis and whether the research can be justified. From the previous analysis and great show of interest from such a small sample and number of responses received, it seems that this hypothesis may be accepted. Out of the 37 questionnaires sent to universities the 15 responses indicate that more than 25% of the population and less than 63% would have responded to the questionnaire. This interval provides a firm basis for justifying further research in that it indicates a great interest within the population for the subject. The same is true for the 27 responses from the sample of 100 CPA's and manufacturers. This response rate indicates that more than 19% and less than 37.3% of the population would have responded. Even though this interval is smaller, a response rate of 30% is considered as normal and thus would fall between the interval boundaries.

Another consideration is that very little research has been done in this area. As firms become more familiar with the subject and the problems associated with it, the response rate will tend to be greater and the results more informative. This will also be true as the use of computers in smaller manufacturing firms increases with the reduction in prices of mini computers. All in all the accounting program with computer emphasis looks very promising for further research based on the pilot test presented above.

RECOMMENDATIONS

Implementation

Even though definite proof of a need for an accounting program with computer emphasis was not found by this research, several recommendations for the implementation of such a program are found if the need does eventually arise. From the results it seems that such a program should basically stress accounting principles, programming, and systems training. It is also indicated that the area of operating should be emphasized. This could be handled through lab facilities with supervised direct student operation. Of course all the areas should be tied in with accounting and accounting applications to achieve the overall purpose of the program. As indicated by the responses many firms could provide advice as to the design of this program.

Future Research

This research pilot study also offered many recommendations for future research to be done in the area of an accounting program with computer emphasis. First of all, a subsequent test should choose a larger population and should optimally include a national population. It would also be better if the population could consist of only firms with some degree of computer use in their accounting system. The problem with this method may be that a source list of these firms does not exist. If this could be overcome, however, the results would be much more informative and many of the vague areas in the pilot questionnaires could be clarified.

Another suggestion for further study would be to test other areas besides the accounting profession and manufacturing industry. With the increase of small computers the retail industry may be a prospective sample for such a test. The university questionnaire, if one was sent, could also include professional schools and junior colleges to broaden the field. A questionnaire might also be sent to students to determine their interest in a program with computer emphasis.

If possible the questionnaire should be longer to obtain more information. This could be done by using alternative scaling methods and question forms to prevent the negative attitude brought about by long questionnaires. Other information which should be asked for is that dealing with current lab facilities of universities, languages and software used by firms, the type hardware used by firms, who teaches the training programs, and what they expect a qualified person coming out with such a degree to know. This information would be very helpful in designing the details of the program curriculum.

Another suggestion is to find an appropriate title for accountants with computer training. This was objected to frequently in the pilot test and thus would be something to be avoided in subsequent tests. This might constitute a question on one of the questionnaires to elicit ideas from respondents as to what it must be. Also along this line would be a suggestion to send the questionnaire to a specific person for his answering only. Research might also need to be done as to who the best person to send it to would be.

Finally, even though this research project did not indicate that a definite need for an accounting program with computer emphasis

exists, it did prove that the interest in such a program does exist and that the future holds probability for such a need arising. It is for this purpose that further research need be done in this area. It is crucial for accounting education as well as accountants to be perceptive to the needs of training in any new area which arises as well as the computer area. Education must be flexible enough to change with the environment which it is educating. Without this flexibility from where will progress come?

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APPENDIX A

List of Samples

CPA Partnerships and Manufacturing Firms

<u>Random No.</u>	<u>Firm and Location</u>
1. 25	Baker & Baker, CPA's - Dallas, TX
2. 107	Davis, Clark & Co., CPA's - Dallas, TX
3. 117	Duest, Wood & Ingram, CPA's - Bryan, TX
4. 143	Grant & Toombs, CPA's - Wichita Falls, TX
5. 232	Lairson, Earl & Co., CPA's - Houston, TX
6. 241	Lauder, Drew & Van Buckle, CPA's - Mercedes, TX
7. 246	Leatherwood & Ward, CPA's - Ft. Worth, TX
8. 317	Pell & Christy, CPA's - Friendswood, TX
9. 321	Pratas, Smith & Moore, CPA's - Lubbock, TX
10. 340	Rosen, Bruce J. & Co., CPA's - El Paso, TX
11. 383	Thomas & Thomas, CPA's - Texarkana, AR
12. 436	Young, Arthur & Co., CPA's - Dallas, TX
13. 448	ACF Industries Inc. - New York, NY Plant: Longview, TX
14. 474	Airco, Inc. - Montvale, NJ Plants: Conroe, El Paso, Ft. Worth, & Houston, TX
15. 475	Airline Valve and Machine Works, Inc. - Houston, TX
16. 476	Airsco, Inc. - Dallas, TX
17. 487	Allen Brace Co. - Midland, TX
18. 501	Amax Aluminum Mill Products, Inc. - Riverside, CA Plant: Mansfield, TX
19. 502	Amchem Products, Inc. - Ambler, PA Plants: Dallas, Houston, TX
20. 524	American Technical Industries, Inc. - New York, NY Plant: Austin, TX
21. 570	Austin Industries, Inc. - Dallas, TX
22. 575	Autotronic Systems - Houston, TX
23. 661	Breckenridge Ready-Mix, Inc. - Breckenridge, TX
24. 727	CBF Industries Inc. - Dallas, TX
25. 739	Central Chemical Corp. - Hagerstown, MD
26. 760	Chico Stone, Inc. - Garland, TX

<u>Random No.</u>	<u>Firm and Location</u>
27.	768 Churro Corp. - Dallas, TX
28.	798 Collier & Son, Inc. - Ft. Worth, TX
29.	809 Cominco American, Inc. - Spokane, WA Plant: Borger, TX
30.	821 Consolidated Frozen Food Lockers, Inc. - Houston, TX
31.	830 Continental Water Conditioning Corp. - El Paso, TX
32.	880 Dallas Midwest Co. - Irving, TX
33.	884 Daniel Industries, Inc. - Houston, TX
34.	961 East Texas Stone Co. - Corsicana, TX
35.	967 Edwards Engineering Corp. - New Orleans, LA Plant: Houston, TX
36.	1015 Federal Pacific Electric Co. - Newark, NJ Plant: Dallas, TX
37.	1038 FMC Corp. - Chicago, IL Plants: Ennis, Los Fresnos, TX
38.	1057 Fritz Chemical Co. - Dallas, TX
39.	1061 Fruehauf Corp. - Detroit, MI Plants: Ft. Worth, San Antonio, TX
40.	1067 GAF Corp. - New York, NY Plants: Dallas, Texas City, Houston, Arlington, TX
41.	1145 Griffen, Ben, Enterprises, Inc. - Dallas, TX
42.	1181 Harrison Mfg. Corp. - Dallas, TX
43.	1187 Hays County Gravel Co. - San Marcos, TX
44.	1228 Horton & Horton, Inc. - Houston, TX
45.	1250 Hunt Oil Co. - Dallas, TX
46.	1268 Ingersoll-Rand Co. - Woodcliff Lake, NJ Plants: Dallas, Houston, TX
47.	1280 International Compressed Air Corp. - Buckinghamshire, ENG Plant: Dallas, TX
48.	1302 Jakvin Industries, Inc. - Irving, TX
49.	1328 Kahn's Bakery Co., Inc. - El Paso, TX
50.	1350 Kerr Glass Mfg. Corp. - Los Angeles, CA Plant: Arlington, TX
51.	1351 Kerr McGee Corp. - Oklahoma City, OK Plant: Corpus Christi, TX
52.	1365 King-O-Pets - El Paso, TX

	<u>Random No.</u>	<u>Firm and Location</u>
53.	1367	Kingstip, Inc. - Austin, TX
54.	1401	Lane Container Co. - Dallas, TX
55.	1408	Leco Lift Corp. - Lakeland, Florida Plant: Houston, TX
56.	1420	Lifetime Doors Inc. - Livonia, MI Plant: Hearne, TX
57.	1422	Lift-All-Co., Inc. - Manhem, PA Plant: Houston, TX
58.	1445	Loomix, Inc. - Grande, CA Plant, Farwell, TX
59.	1453	Loxscreen Co., Inc. - Columbia, SC Plant: Arlington, TX
60.	1472	Magnatex Corp. - Midland, TX
61.	1480	Marathon Oil Co. - Findlay, OH Plant: Houston, TX
62.	1505	McCormick & Co. - Hunt Valley, MD Plant: Paris, TX
63.	1525	Merrytime Diversified Products, Inc. - Marshall, TX
64.	1537	Miller Bros. Industries, Inc. - Dallas, TX
65.	1541	Mission Ice & Fuel Co. - San Antonio, TX
66.	1581	MRO Group, The - Wichita Falls, TX
67.	1582	MUESCO, Inc. - Houston, TX
68.	1596	Nardis of Dallas, Inc. - Dallas, TX
69.	1605	National City Lines, Inc. - Denver, CO Plant: Dallas, TX
70.	1624	Netex Frozen Foods, Inc. - New York, NY Plant: Waco, TX
71.	1627	Newell Salvage Co. - San Antonio, TX
72.	1629	News International, Ltd. - London, ENG Plant: San Antonio, TX
73.	1658	Oglebay Horton Co. - Cleveland, OH Plant: Brownsville, TX
74.	1667	Olin Corporation - Stamford, CN Plant: Pasadena, TX
75.	1680	Overseas Inns - Luxembourg, LUX Plant: Brownsville, TX

<u>Random No.</u>	<u>Firm and Location</u>
76. 1683	Pacific Food Products - Seattle, WA Plant: Dallas, TX
77. 1689	Pamex Foods, Inc. - Ft. Worth, TX
78. 1696	Parker Bros. & Co., Inc. - Houston, TX
79. 1714	Pepsi Co., Inc. - Purchase, NY Plant: Arlington, TX
80. 1733	Pioneer Food Industries - DeWitt, AR Plant, Texarkana, TX
81. 1782	Quality Signs Inc. - Lufkin, TX
82. 1830	Ridley Packing Co. - Duncan, OK Plant: Sweetwater, TX
83. 1897	Scot Industries, Inc. - Milwaukee, WI Plant: Lone Star, TX
84. 1914	Sheller Globe Corp. - Toledo, Ohio Plant: Brownsville, TX
85. 1917	Shirey Co., Inc. - Greenville, TX
86. 1928	Simmons Cotton Oil Mills - Dallas, TX
87. 1961	Southern Ice & Cold Storage - Dallas, TX
88. 1981	Southwestern Blueprint Co. - Dallas, TX
89. 2006	Standard Meat Co. - Ft. Worth, TX
90. 2020	Stern, Jacob & Sons, Inc. - Jenkintown, PA Plant: Houston, TX
91. 2043	Superior Furniture Mfg. Co. - Houston, TX
92. 2051	Sweetwater Ready Mix Concrete Co. - Sweetwater, TX
93. 2090	Texas Citrus Exchange - Edinburg, TX
94. 2153	Treton, Inc. - Bellaire, TX
95. 2201	United Foods, Inc. - Memphis, TN Plant: Brownsville, TX
96. 2286	Wheelabrator-Frye, Inc. - New York, NY Plant: Houston, TX
97. 2288	White Mfg. Co. - Houston, TX
98. 2302	Wilson Mfg. Co. - Wichita Falls, TX
99. 2305	Wing Industries - Garland, TX
100. 2307	Winston, John, Oil Co. - Lufkin, TX

Texas Universities

1. Abilene Christian University
2. San Angelo State University
3. Baylor University
4. East Texas State University
5. Hardin-Simmons University
6. Lamar University
7. Midwestern University
8. North Texas State University
9. Pan American University
10. Rice University
11. Saint Edward's University
12. Saint Mary's University
13. Sam Houston State University
14. Southern Methodist University
15. Southwest Texas State University
16. Southwestern University
17. Stephen F. Austin State University
18. Sul Ross State University
19. Texas A&I University
20. Texas A&M University
21. Texas Christian University
22. Texas Southern University
23. Texas Tech University
24. Texas Women's University
25. Trinity University
26. University of Corpus Christi
27. University of Dallas
28. University of Houston
29. University of Plano
30. University of Saint Thomas
31. University of Texas at Austin
32. University of Texas at Arlington

33. University of Texas at Dallas
34. University of Texas at El Paso
35. University of Texas at San Antonio
36. University of Texas of the Permian Basin
37. West Texas State University

APPENDIX B

Letter, Instructions and Questionnaires

Texas Universities

Questionnaire

Sharon Floyd
500 Foch #9
Bryan, TX 77801

December 21, 1976

Dear Sir:

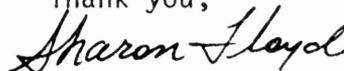
Are your present accounting programs keeping up with the many new developments within the accounting field? Are the graduates coming from your department prepared for what they will face in the business world?

Hopefully the answers to these questions will be yes. However, it is my experience that the area of computer accounting, which includes computer auditing, systems design and principles is not as well developed as the present situation calls for. With the increasing use of computers in the accounting field it seems hardly appropriate that it should be so ignored.

I am a senior accounting student at Texas A&M University doing research on the possibility of including a separate degree for students interested in the computer accounting area. This degree, if developed, would include the basic accounting principles applied to computer accounting systems. It would also include programming, system design, and computer audit training. This training is currently done by the business firms and accounting firms requiring these services. It is my proposal that this training could be better taken care of within the University.

The questionnaire enclosed is designed to elicit your comments about this type program which will in turn help to support or modify my hypothesis. I have tried to make it as brief as possible since I know your time is valuable. However, if you can spare a few minutes your cooperation will be greatly appreciated.

Thank you,



Sharon Floyd

Enclosure

Questionnaire On Accounting Education
With Computer Emphasis

INSTRUCTIONS

The following questionnaire is designed to elicit both factual data and opinions concerning the idea of having a separate degree plan for students interested in the computer area. The standard procedure of circling your preferred response is used for most of the questions. However, a few of the factual questions will be fill in answers where approximations are acceptable. If a question has an "other" option, and you wish to comment please feel free to do so in the space provided. Any questions which you feel you would rather not answer or cannot answer please disregard. However, no obligation is formed by answering any of the questions. Also, if more than one response seems appropriate feel free to mark as many as you wish. An addressed envelope has been included for you convenience.

1. What is the average enrollment over the past five years of your University? _____
2. What is the average enrollment for the past five years of your business college? _____
3. Approximately how many students are enrolled in your accounting program? _____
4. Do you have a separate program or degree plan for accounting students interested in the computer area?

1	2
yes	no
5. If not, do you have optional or required courses in the computer area in your other accounting programs?

1	2
yes	no
6. How much demand is shown by students for this program or these courses?

1	2	3	4
no demand	very little demand	moderate demand	very great demand
7. If a separate computer accounting program does not exist in your university would you be in agreement with the need for one?

1	2	3	4
total disagreement	slight agreement	moderate agreement	total agreement
8. Would you be interested in incorporating this type program into your present system?

1	2	3	4	5
not interested	slightly interested	moderately interested	very interested	already have such a program
9. At what level of education do you feel this type program would be most beneficial?

1	2	3	4
would not be beneficial at any level	undergraduate freshman & up	junior & up	graduate masters program

other _____

Texas
CPA and Manufacturing
Questionnaire

Sharon Floyd
500 Foch #9
Bryan, TX 77801

December 21, 1976

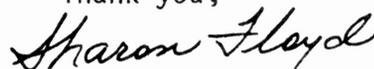
Dear Sir:

Is your data processing department keeping up with the increasing demands being put upon it, or are you among the many manufacturers and accountants who are running into expensive problems due to unqualified personnel? If so, this questionnaire may be of interest to you.

I am a senior accounting student at Texas A&M University doing research on the possibility of including a separate degree for students interested in the many computer or data processing areas within the accounting field. This degree, if developed, would include the basic accounting principles applied to computer accounting systems. It would also include programming, system design, and computer audit training. Since you are the ones who are searching for and hiring these people, I feel there is a lot I can learn from your comments to support or modify my hypothesis.

I have tried to make this questionnaire as brief as possible since I know your time is valuable. However, if you can spare a few minutes I would deeply appreciate your cooperation.

Thank you,



Sharon Floyd

Enclosure

Questionnaire On Accounting Education
With Computer Emphasis

INSTRUCTIONS

The following questionnaire is designed to elicit both factual data and opinions concerning the idea of having a separate degree plan for students interested in the computer area. The standard procedure of circling your preferred response is used for most of the questions. However, a few of the factual questions will be fill in answers where approximations are acceptable. If a question has an "other" option, and you wish to comment please feel free to do so in the space provided. Any questions which you feel you would rather not answer or cannot answer please disregard. However, no obligation is formed by answering any of the questions. Also, if more than one response seems appropriate feel free to mark as many as you wish. An addressed envelope has been included for your convenience.

Before you begin I feel I should define what I mean by the terms computer accountant or computer accounting personnel. Depending upon your own situation, these terms could include computer auditors, system design analysts, forecasters, computer specialists or any other position which combines the areas of accounting and computer science or data processing. Keeping this in mind, please proceed to the questionnaire.

1. How dependent on computer time or data processing is your present system of accounting?

1	2	3	4
totally independent	slightly dependent	moderately dependent	totally dependent

2. How many "computer-accounting" personnel do you employ? _____

3. How many of these personnel have a college degree in accounting?

4. How many of these personnel have a college degree in computer science or data processing? _____

5. How many of these personnel have a college degree in a combination of accounting and computer science or EDP? _____

6. Are you satisfied with the training of these personnel?

1	2	3	4	5
totally dissatisfied	slightly dissatisfied	neutral	slightly satisfied	totally satisfied

7. What educational areas are weak in college graduates going into the computer accounting field?

1	2	3	4	5
none	systems training	programming	accounting principles	math

other _____

8. Do you have your own training program for computer accounting personnel?

1	2
yes	no

If your answer to question 8 is yes please answer questions 9-11.
If it is no proceed to question 12.

9. How long does your training program last? _____

10. What type training does your program include?

1	2	3	4
classroom	correspondent	on the job	classroom & on the job

other _____

11. What type experience is required of an applicant to your program?

1	2	3	4
none	college degree	accounting experience	EDP experience

other _____

12. What area or areas of your computer system present the most problems or require the most supervision?

1	2	3	4
systems	programming	security	operating

other _____

13. Do you feel it would be beneficial from your firm's point of view to have special computer training for interested accounting students at the university level?

1	2	3	4
it would not be beneficial	slightly beneficial	moderately beneficial	very beneficial

14. Would your firm be willing to donate funds and/or advice to see such a program started in college education?

1	2	3	4	5
no support	advice	limited financial support	moderate financial support	total support

15. How do you foresee the future need for computer accountants?
i.e., Will you be looking for an increasing number of these people?

1	2	3	4	5
decreasing number	same number	slightly increasing number	increasing number	greatly increasing number

APPENDIX C

Questions and Answers

1. What is the average enrollment over the past five years of your University?

There were 15 responses to this question with the following enrollments given as answers:

1,500; 1,650; 1,800; 3,200; 4,000; 4,500; 5,500; 7,500; 8,500; 10,500; 16,000; 16,500; 21,000; 32,000; 40,000.

2. What is the average enrollment for the past five years of your business college?

There were 14 responses to this question with the following enrollments given as answers:

220; 500; 540; 850; 1,000; 1,200; 1,500 (2); 3,000; 3,500; 4,000 (2); 4,100; 5,500.

3. Approximately how many students are enrolled in your accounting program?

There were 15 responses to this question with the following enrollments given as answers:

25; 70; 150; 250; 260; 300 (2); 450; 500; 725; 1,000 (2); 1,100; 1,500; 2,800.

4. Do you have a separate program or degree plan for accounting students interested in the computer area?

1. yes -- 3 responses
2. no -- 11
non-response -- 1

5. If not, do you have optional or required courses in the computer area in your other accounting programs?

1. yes -- 13 responses
2. no -- 0
non-response -- 2

6. How much demand is shown by students for this program or these courses:

1. no demand -- 0 response
2. very little demand -- 3
3. moderate demand -- 8
4. very great demand -- 3
non-response -- 1

7. If a separate computer accounting program does not exist in your university would you be in agreement with the need for one?

1. total disagreement -- 2 responses
2. slight agreement -- 4
3. moderate agreement -- 3

7. 4. total agreement -- 1
non-response -- 5
8. Would you be interested in incorporating this type program into your present system?
 1. not interested -- 1 response
 2. slightly interested -- 2
 3. moderately interested -- 2
 4. very interested -- 4
 5. already have such a program -- 1
non-response -- 5
9. At what level of education do you feel this type program would be most beneficial?
 1. would not be beneficial at any level -- 0 response
 2. undergraduate freshman & up -- 5
 3. junior & up -- 6
 4. graduate masters program -- 6
non-response -- 3

1. How dependent on computer time or data processing is your present system of accounting?

- 1. totally independent -- 9 responses
- 2. slightly dependent -- 0
- 3. moderately dependent -- 8
- 4. totally dependent -- 7
- responding to both items #3 & #4 -- 3

2. How many "computer-accounting" personnel do you employ?

- 0 personnel employed -- 11 responses
- 1 -- 2
- 2 -- 4
- 3 -- 1
- 6 -- 3
- 10 -- 1
- 16 -- 1
- 18 -- 1
- 30 -- 1
- 50 -- 1
- 100 -- 1

3. How many of these personnel have a college degree in accounting?

- 0 personnel with degree -- 14 responses
- 1 -- 6
- 2 -- 2
- 5 -- 2
- 10 -- 1
- 25 -- 1
- 28 -- 1

4. How many of these personnel have a college degree in computer science or data processing?

- 0 personnel with degree -- 22 responses
- 1 -- 1
- 2 -- 2
- 3 -- 1
- 21 -- 1

5. How many of these personnel have a college degree in a combination of accounting and computer science or EDP?

- 0 personnel with combination degree -- 22 responses
- 1 -- 1
- 3 -- 1

6. Are you satisfied with the training of these personnel?
 1. totally dissatisfied -- 1 response
 2. slightly dissatisfied -- 3
 3. neutral -- 3
 4. slightly satisfied -- 6
 5. totally satisfied -- 3
 - non-response -- 11

7. What educational areas are weak in college graduates going into the computer accounting field?
 1. none -- 1 response
 2. systems training -- 10
 3. programming -- 6
 4. accounting principles -- 6
 5. math -- 1
 - non-response -- 13

8. Do you have your own training program for computer accounting personnel?
 1. yes -- 4 responses
 2. no -- 14
 - non-response -- 9

9. How long does your training program last?

There were 4 responses to this question and the answers were given as follows:

continuous; 2-8 weeks; 6-8 weeks; 6 mo. - 1 year.

10. What type training does your program include?
 1. classroom -- 0 response
 2. correspondent -- 1
 3. on the job -- 1
 4. classroom & on the job -- 3
 - non-response -- 23

11. What type experience is required of an applicant to your program?
 1. none -- 1 response
 2. college degree -- 2
 3. accounting experience -- 3
 4. EDP experience -- 2
 - non-response -- 23

12. What area or areas of your computer system present the most problems or require the most supervision?
1. systems -- 8 responses
 2. programming -- 8
 3. security -- 1
 4. operating -- 6
 - non-response -- 4
13. Do you feel it would be beneficial from your firm's point of view to have special computer training for interested accounting students at the university level?
1. it would not be beneficial -- 2 responses
 2. slightly beneficial -- 2
 3. moderately beneficial -- 6
 4. very beneficial -- 7
 - non-response -- 10
14. Would your firm be willing to donate funds and/or advice to see such a program started in college education?
1. no support -- 3 responses
 2. advice -- 9
 3. limited financial support -- 1
 4. moderate financial support -- 1
 5. total support -- 5
 - non-response -- 15
15. How do you foresee the future need for computer accountants? i.e., Will you be looking for an increasing number of these people?
1. decreasing number -- 1 response
 2. same number -- 3
 3. slightly increasing number -- 3
 4. increasing number -- 7
 5. greatly increasing number -- 1
 - non-response -- 12

APPENDIX D

Poisson Table

TABLE FOR DETERMINING UPPER AND LOWER LIMITS OF POPULATION ERROR RATE
 BASED ON SAMPLE RESULTS

Each Hypothesis Either Lower or Higher May be Rejected With Indicated Confidence

Number of Events Served	99%		97.5%		95%		90%		85%		80%	
	L	H	L	H	L	H	L	H	L	H	L	H
0	*	4.7	*	3.7	*	3.00	*	2.4	*	1.90	*	1
1	.010	6.7	.028	5.6	0.05	4.80	0.10	3.9	.160	3.40	.22	3
2	.150	8.5	.240	7.3	0.40	6.30	0.50	5.4	.700	4.70	.800	4
3	.500	10.1	.600	8.8	0.80	7.80	1.10	6.7	1.30	6.00	1.50	5
4	.800	11.7	1.10	10.3	1.40	9.20	1.70	8.0	2.00	7.30	2.30	6
5	1.30	13.2	1.60	11.7	2.00	10.60	2.40	9.3	2.80	8.50	3.10	7
6	1.80	14.5	2.20	13.1	2.60	11.90	3.20	10.6	3.60	9.70	3.90	9
7	2.40	16.0	2.80	14.5	3.30	13.20	3.90	11.8	4.40	10.90	4.70	10
8	2.90	18.0	3.40	15.8	4.00	14.50	4.70	13.0	5.20	12.10	5.60	11
9	3.50	19.0	4.10	17.1	4.70	16.00	5.40	14.3	6.00	13.30	6.40	12
10	4.10	21.0	4.80	18.4	5.40	17.00	6.2	15.5	6.80	14.40	7.30	13
11	4.80	22.0	5.50	19.7	6.20	18.30	7.0	16.7	7.60	15.60	8.20	14
12	5.50	23.0	6.20	21.0	6.90	19.50	7.8	18.0	8.50	16.7	9.00	16
13	6.10	24.0	6.90	22.3	7.70	21.0	8.6	19.0	9.3	18.0	9.90	17
14	6.80	26.0	7.60	23.5	8.50	22.0	9.5	20.2	10.20	19.0	10.80	18
15	7.50	27.0	8.40	24.7	9.20	23.40	10.3	21.4	11.10	20.1	11.70	19
16	8.20	29.0	9.10	26.0	10.0	24.30	11.1	22.6	11.9	21.30	12.60	20
17	8.90	30.0	9.90	27.3	10.8	26.0	12.0	23.8	12.8	22.40	13.50	21
18	9.60	31.0	10.70	28.5	11.6	27.0	12.8	25.0	13.7	23.50	14.40	22

TABLE FOR DETERMINING UPPER AND LOWER LIMITS OF POPULATION ERROR RATE BASED ON SAMPLE RESULTS
(continued)

Number of Events Served	99%		97.5%		95%		90%		85%		80%	
	L	H	L	H	L	H	L	H	L	H	L	H
19	10.40	32.0	11.40	29.6	12.4	28.0	13.7	26.0	14.5	24.7	15.3	23
20	11.30	34.0	12.2	31.0	13.3	29.0	14.5	27.1	15.4	25.8	16.2	24
21	11.80	35.0	13.0	32.0	14.1	30.3	15.0	28.3	16.3	27.0	17.0	26
22	12.60	35.6	13.8	33.3	14.9	31.5	16.2	29.3	17.2	28.	18.0	26.9
23	13.40	37.0	14.6	34.6	15.7	32.6	17.0	30.5	18.1	29.1	18.9	28.0
24	14.1	38.0	15.3	35.7	16.5	33.8	18.0	31.4	19.	30.1	20.0	29.1
25	14.9	39.3	16.2	37.0	17.3	35.0	18.8	32.7	19.8	31.4	20.7	30.2
25	15.6	40.8	17.0	38.1	18.2	36.1	19.8	34.0	20.8	32.8	21.7	31.2
27	16.4	42.0	17.8	39.4	19.0	37.3	20.5	35.0	21.6	33.5	22.5	32.3
28	17.2	43.0	18.6	40.5	19.9	38.5	21.5	36.1	22.6	34.6	23.5	33.3
29	18.0	44.3	19.4	41.7	20.7	39.6	22.2	37.2	23.4	35.6	24.3	34.1
30	18.7	45.5	20.2	42.9	21.6	40.7	23.3	38.4	24.4	36.83	25.3	35.6
31	19.5	46.8	21.0	44.0	22.4	42.0	24.0	39.1	25.2	37.8	26.2	36.7
32	20.3	48.0	21.8	45.1	23.3	43.0	25.0	40.3	26.2	39.0	27.2	37.7
33	21.1	49.0	22.6	46.3	24.1	44.2	26.0	41.5	27.	40.0	28.2	39.0
34	21.9	50.3	23.5	47.5	25.0	45.3	26.7	42.7	28.	41.1	29.0	40.0
35	22.6	51.7	24.3	48.8	25.8	46.4	27.7	43.8	29.	42.3	30.0	41.0
36	23.6	52.7	25.2	49.9	26.7	47.6	28.5	45.0	29.8	43.5	30.8	42.0
37	24.3	54.0	26.1	51.0	27.6	48.7	29.3	46.1	30.8	44.4	31.8	43.1
38	25.1	55.0	26.9	52.1	28.4	49.8	30.3	47.2	31.8	45.5	32.8	44.1
39	26.0	56.3	27.7	53.4	29.3	51.0	31.3	48.3	32.5	46.6	33.6	45.2

TABLE FOR DETERMINING UPPER AND LOWER LIMITS OF POPULATION ERROR RATE BASED ON SAMPLE RESULTS
(continued)

Number of Events Served	99%		97.5%		95%		90%		85%		80%	
	L	H	L	H	L	H	L	H	L	H	L	H
40	26.8	57.3	28.5	54.5	30.2	52.0	32.0	49.4	33.5	47.7	34.6	46.3
41	27.6	58.66	29.4	55.6	31.0	53.2	33.0	50.5	34.3	48.7	35.5	47.4
42	28.4	60.0	30.3	56.8	32.0	54.4	34.0	51.6	35.3	49.8	36.4	48.4
43	29.2	61.0	31.08	58.0	32.8	55.5	34.7	52.6	36.3	50.9	37.4	49.3
44	30.0	62.0	31.9	59.0	33.7	56.6	35.7	54.0	37.3	52.0	38.4	50.5
45	31.0	63.0	32.9	60.3	34.6	57.7	36.7	55.0	38.0	53.0	39.2	51.1
46	31.6	64.0	33.5	61.4	35.4	59.0	37.7	56.0	39.0	54.1	40.2	52.3
47	32.4	65.0	34.5	62.6	36.2	60.0	38.3	57.0	40.0	55.2	41.2	53.4
48	33.0	67.0	35.5	63.7	37.1	61.1	39.3	58.0	41.0	56.2	42.0	54.5
49	34.2	68.0	36.3	64.8	38.0	62.2	40.3	59.7	41.8	57.3	43.0	55.7
50	35.0	69.0	37.1	65.8	39.0	63.3	41.0	60.4	42.8	58.4	44.0	57.0
51	36.0	70.3	38.	67.0	39.8	64.5	42.0	61.5	43.8	59.5	45.0	58.0
52	36.8	71.3	38.8	68.2	40.7	65.5	43.0	62.5	44.8	60.6	45.8	59.0
53	37.5	72.7	39.6	69.3	41.6	66.7	44.0	63.6	45.5	61.6	46.8	60.0
54	38.4	74.0	40.6	70.5	42.5	67.8	45.0	64.7	46.3	62.7	47.8	61.1
55	39.2	75.0	41.4	71.6	43.4	69.0	45.7	66.0	47.3	63.8	48.8	62.2
56	40.0	76.0	42.3	72.7	44.2	70.0	46.7	67.0	48.3	64.8	49.5	63.2
57	41.0	77.3	43.2	74.0	45.2	71.1	47.3	68.0	49.3	65.9	50.5	64.3
58	41.8	78.3	44.	75.0	46.0	72.2	48.3	69.0	50.3	67.0	51.5	65.4

Note: This table was developed using E. C. Molina, Poisson's Exponential Binomial Limit--D. Van Nostrand Company, Inc., New York: 1949.

*If number of events observed is 0 lower hypothesis may not be established.

*Use of poisson develops conservative estimates. Thus, the lower limits are slightly understated and the upper limits are slightly overstated.