This interim report discusses the adjustments auditing firms are making as a result of the advent of the computer. Data were obtained from (1) a review of the literature, (2) attendance at professional association meetings, and (3) a series of interviews with accountants. The findings to date indicate that the normative patterns governing the organization and division of labor have broken down due to the emergence of the computer as part of accounting systems. The traditional structure of auditing firms is a bureaucratic pyramid. Use of the computer reduces the necessary number of lower status positions, whereas middle level employment of specialists in computer technology has increased. The upper level auditors and the specialists have communication problems which place the traditional noncomputer-trained auditors in a situation of conflict. Their pattern of role behavior has changed and informal norms have developed to meet the needs created by the computer audit. (Author/ME)
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A Study of the Transitional Adjustment of a Professional Group to its Altered Role

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Background for the Study

The original design for the more technical aspects of this current research was an observational approach in which two different types of audit situations would be compared—the audit of the client with a computerized accounting system, and the audit of the "traditional" or manual client system. We proposed to control for variables present in any audit situation (e.g., firm size, type of industry) in order to isolate those changes in the auditor's role performance solely attributable to the presence of the computer.

Our reading of the professional literature had led us to the conclusion that the computer audit had reached a sufficiently high degree of institutionalization to permit a research design in which we could comparatively observe audit situations as our major method of study. The literature is in fact quite misleading in the impression it gives of how much computer auditing actually exists. We were led to expect the larger accounting firms to be spending more of their audit time with clients who had either well-developed computer systems, or who were currently involved in the transition to such systems, than was the case. Our beliefs were supported by the numerous statistics showing the overall growth of the computer in business and industry.

In contacting a number of CPA firms which have had some experience in the area of computer auditing, we found that in fact there were very few individuals actually involved with this development. Overall, the impact of the computer in accounting is least felt by the auditor. Rather, it is in management services work and bookkeeping where changes are being felt the most. The majority of CPA auditors, therefore, are not doing computer auditing per se, but many are certainly projecting for the future effect of the computer on the audit.

We were then faced with a dilemma as our design necessitated the existence of a large number of computer audit situations for observation. These proved rare, even among the large firms. This problem was compounded by the fact that the current state of computer auditing is best described as emergent. We had assumed we would find two distinct and institutionalized forms of auditing practice—the manual audit and the computer audit. We expected clear differences in terms of procedures and techniques unique to each type, and that these had become institutionalized practices in themselves.

In reality, the adaptation to the computer is being accomplished by the profession in a highly unordered manner. At this point, no formalized set of operations for handling computer tasks has been consensually adopted by
CPAs. The computer audit—when it does occur—is handled situationally by each firm, which vary their methods depending upon both client needs and the CPA firm resources.

All of the above made comparative observations impossible. There was no way to control and assess differences as there were a myriad of types of situational solutions in existence for doing the computer audit. Too many variables were present for our control. As there were no institutionalized patterns of computer adaptation in existence, we realized that the more realistic focus of study would be the process of transition itself. A new approach to the research was necessarily established, and this is discussed in the next section of this interim report.
Research Efforts to Date

The focus of our research has turned from the observation and comparison of two institutionalized audit procedures, to a more realistic study of the process of transition presently occurring in auditing due to the advent of the computer.

We have made use of three major research resources to date. The first of these is an extensive review of all the professional literature in the field of accounting and computer technology associated with the focus of our study. We limited our reading to a review of books and journal articles concerned with the relationship of computer to the audit. We note this because there does exist an abundant amount of literature dealing with the effects of the computer on other aspects of accounting—such as management services work and the installation and adaptation to the computer of bookkeeping, operations and tax. We read specifically about the procedures available to the auditor for working with the computer—a myriad of possibilities at this point with no procedural pattern as yet institutionalized.

Our second major research effort was our attendance at a number of professional association meetings and conferences where the problems of the computer were discussed by those in the accounting profession most concerned about its impact.

Lastly, we are conducting a series of interviews in which the effects of the computer are discussed at length with those particular accountants currently engaged in auditing computers as part of their more regular professional tasks.

In addition to these three major research efforts, the research team has spent a great deal of time in gaining an understanding of the complex nature of the digital computer as well as professional accounting procedures. Starting in the Fall of 1967, members of the research staff sat in on courses on computer programming and operation at San Diego State College. Additionally, these same researchers attended courses in auditing and other accounting procedures offered by the Department of Accounting at San Diego State College. The knowledge gained from these efforts was discussed at

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1 For a bibliography of the literature read, see Appendix A.
several informal meetings of the research team until it was felt that all had sufficient expertise in the basic technical aspects of the problem we are studying.

To better facilitate this understanding, a CPA apprentice with an interest in the sociological elements of the study was hired over the Summer of 1968. He assisted the research staff in understanding the more difficult technical aspects of the problem. This assistant was also present at some of the interviews conducted with auditors to offer his insights in the accounting procedures and to act as a general intermediary between sociologist and accountant.

Thus our research efforts to date reflect the complexity we discovered present in both the technical and transitional aspects of computer influence on auditing procedure.
Findings to Date

The traditional normative patterns governing the organization and division of labor of the auditor, audit-team, and accounting firm have been broken down due to the emergence of the computer as part of accounting systems. We will first discuss the changes within the accounting firm.

The traditional structure of the accounting firm is best described as a bureaucratic pyramid in which the "juniors" of the firm form the broad base, with the middle managers ("managers" and "supervisors") above them, and with the narrow top composed of the firm partners. The pyramid--moving from bottom to top--increased in both status and authority. The computer and its associated technological complexity is slowly altering this pattern and thus breaking down the traditional norms associated with accounting firm structure and organization.

Currently, firm structure is moving away from the pyramid form of organization and is becoming what might best be described as a "penguin"--a structure narrow at both the top and the bottom, with a broad middle. While the process of this transition is slow, the effects are already being felt in the large firms where both status structure and division of labor have always been rather well-defined.

There are two major reasons for this gradual alteration of accounting firm structure. The first is the computer's ability to assume many of the clerical aspects of auditing. This alleviates the necessity of the firm maintaining a broad base of lower status positions. The junior accountant's traditional job has been the performance of these clerical functions associated with the data review requirements of the audit. Therefore, the broad base is narrowing as the firms sharply decrease their hiring of juniors. In the meantime, the middle level has been swelled by the infusion of specialists who are capable of dealing with computer technology. These men, because of their technical training, are normally given middle staff positions within the accounting firm organization.

There is yet a second reason for the increase of mid-range positions within the accounting firm structure. The computer's increased importance for accounting has also increased the demand for instructors and other training personnel whose major responsibility is to bring together old and new within the firm, and to establish greater technical competence with reference to the computer.
In both situations, the firms have had to create many new positions for specialists of all types—especially management services—in order to aid the accountant in relating his professional services to computer situations.

We turn now to the changes noticeable in the audit-team. The professional services of the auditor, except in the case of the solo practitioner dealing with extremely small businesses, are never performed individually. The professional demands created by the enormity of accounting systems, coupled with the auditor's mandate of evaluative expertise, requires that the audit become a group effort. It has become apparent in work to date that the computer has upset the normative structure regulating the organization and division of labor of the traditional audit-team. The success of any given audit is dependent upon not only the competent performance of professional services, but upon the efficient organization and allocation of firm labor.

The requirements of the audit cause the CPA firms to spend a great deal of time in regulating the program of audit staffing. Traditionally, the methods by which staffing was carried out were well-defined and routinely implemented. The norms of audit-staff organization were built around the requirements of large amounts of supervision of audit personnel. The structure of the firm itself provided an organization compatible with the demands of effective audit control and regulation. The division of labor was based to a large degree upon these same demands for precision and control. The work was regulated by the firm via the use of a supervisory chain of command in which expertise and authority increased as one went up the line of status positions.

The high degree of technical complexity associated with the addition of the computer into accounting systems has broken down the norms of efficiency and control associated with pre-computer audit staffing plans. No longer is the firm capable of insuring that all of its auditing personnel are competent to evaluate the myriad of new conditions created by the computer. The rapid growth of knowledge associated with computer technology has created a severe lag in the educational training of accounting personnel. Currently, although both the profession and the academic institutions are working overtime to bring educational standards into line with technological demands, there still remains insufficient resources within the profession itself for dealing effectively and competently with the computer.

Therefore, the firm is faced with a constant stream of
auditing situations in which the standard staffing procedures cannot be relied upon for a competently performed audit. This problem was seen by most of the men with whom we spoke as the biggest source of difficulty in adapting to the computer audit.

The degree to which traditional norms regulating staffing are upset by computer centered audits is a direct function of the complexity of the system being dealt with, and the availability of competent personnel. In attempting to cope with the problem of insuring competence and efficiency in allocating firm resources, it has become necessary for audit personnel to deal with each computer audit situationally. In many instances it becomes impossible for firm administrators to follow any consistent pattern of staffing, and often their decision will rest solely on their individual ability to find someone within the firm technically competent to meet the situational demands of the current audit.

The first impact of the computer on the accounting profession as a whole was actually not in the auditing area. Rather, it appeared with the emergence of management services as an independent professional sub-specialty. Thus, CPA firms in trying to offer their clients the maximum of service in areas of business beyond that of auditing, have had to rely on specialists in other professions to aid them in this effort. The M.S. departments of the large accounting firms have become a haven for specialists with knowledge of both accounting systems and computer technology, and have become therefore a potential source of competent staff for the auditor to evaluate the systems of clients using computers.

While these management services specialists are available within the accounting firm, the auditing staff is reticent to take advantage of their services, feeling they cannot be sure of the competence of these specialists in the rigors of auditing technique. At the same time, the auditors themselves do not have a high level of competence in areas of computer technology, and they cannot assure that their supervision of an audit will insure its competent performance.

Another problem is the rise of communication problems between the auditors in charge of a job, and any specialists they may call in to assist. But, despite the preference of the audit team not to call upon outside specialists, it often becomes necessary and unavoidable. Additionally, there is no guarantee that even the calling in of management services specialists will insure the solving of all the problems which arise.
Thus it can be seen even at this point that there is occurring a breakdown in both the traditionally well-ordered line of command and expertise. In our evaluation of the many ways in which audit departments have adjusted their staffing plans to the problems discussed above, we began to discover that there is a characteristic pattern of informal norms developing to meet the needs created by the computer audit. While the traditional methods of allocating personnel could not be totally relied upon, the auditors had created a set of operating procedures which would afford some degree of efficiency and simultaneously, partially insure the adherence to proper audit personnel supervision.

The emerging pattern of allocating staff was based on the conditions of the computer system being audited. In most cases, if the system was extremely advanced, the auditors would assume the necessity of an M.S. specialist and would call in a man from the M.S. department regardless of any other situational circumstances. If, however, the computer system was not particularly complex, and the auditors felt they had sufficient competence for dealing with the audit, they would only call the extra-departmental specialists in for the initial evaluation of the system's internal control. After that, unless a problem arose which they felt they couldn't handle, their policy was to stick with the use of their own audit staff in order to avoid the problems involved when dealing with outside specialists.

It was apparent that the situation created by the computer audit relationship had placed these auditors in a situation of conflict. None of these men were the least satisfied with the interim procedures they had adopted to cope with the staffing problems brought about by the computer. Their overall frustration was not limited to concerns for the professional inefficiencies of the system they had implemented, but was focused more on the ethical dilemmas (independence and competence) which arose as the direct result of the changes the computer had brought into their traditionally organized routines. The emergent qualities of these problems were consistently observable. In one interview situation, the respondent's reply to questions about staffing was in the form of an invitation to assist him in his choice of staff. He noted that this condition would never have existed had it not been for the ominous nature of the problem of competence associated with the relationship to the "machine."

The normative transition outlined above is slowly being dealt with by all of the firms with which we worked. It is only a matter of time before resources and demands
reach a level of equalization. Until that time, however, auditors will be faced with the use of emergent and transitional methods of dealing with the problems created by the computerized accounting systems. It is hoped that in our next set of interviews we will better be able to get at the roots of ethical conflict created by what is now the obvious breakdown of regulative norms in the areas outlined. We will be specifically concerned with the individual resolution mechanisms utilized by the men in handling the conflicts.

The process of transition and adaptation to computerized accounting systems in the above discussion has dealt primarily with the breakdown of norms regulating the division of functional personnel. This has resulted in the inappropriate use of non-audit staff in audit problems.

The process of transition and adaptation to computerized accounting systems has also created a breakdown in the normative order governing the role of the individual auditor. Other strains created by the computer in the management and staffing of the audit team are being felt by the auditor in the organization and performance of his job.

The high degree of organization required of the accounting firm for efficient and effective auditing has always extended into the realm of the behavior of the professional auditor. The exigencies created by the enormous size of many accounting systems has made it mandatory for auditors to be explicit in the definition, organization, and implementation of their job tasks. Traditionally, most accounting firms have adopted institutionalized audit programs which serve as formats for accomplishing this goal. Such programs stipulate the necessary procedures to be followed and performed during the execution of a given audit. Although the procedures in the program are variable in terms of the conditions of the accounting system under audit, the program as a whole forms the standardized backdrop for regulating and routinizing auditor job performance in most audit situations.

In addition to the delineation of strict audit procedures, auditors have traditionally insured the necessary organization of the audit process through their ability to stipulate temporal limits for each of the procedures in the audit program. They could in this way evaluate the audit process via the general procedural format as well as through the use of an established time schedule for individual audit procedures. Audit efficiency was further maintained through evaluation of job performance, which was facilitated through a well-defined chain of command based on the competence level of the personnel in-
Through these institutionalized patterns of timing, job responsibility, and evaluation, the individual auditor's role was well-defined and well-regulated. He could be certain of the expectations held of him and the limitations placed on any audit performance. The audit itself thus possessed the potential of a smooth and efficiently run operation in which the division of labor, time limits, and the specific functions were well-defined and regularly implemented. One major impact of the computer has been to break down these institutionalized patterns of the auditing process.

How does the computer render obsolete or break down the traditional audit pattern? First, traditional audit procedures often are no longer applicable. However, while our studies have shown that although the computer is rapidly altering these traditional audit procedures, this alteration of the individual auditor's role is currently not as evident as other aspects of the breakdown of the normative order. In brief, the auditor has not as yet been forced to change completely his traditional procedures, but rather has been able to modify them situationally. The major reason for this is that computer technology as applied currently in business systems is not yet sufficiently advanced to force procedural changes in the majority of these cases.

The computer is having an observable effect on the control and evaluation of the auditor's role behavior, despite the lack of widespread change in the general procedures of the audit. One aspect of this is the breakdown of the schedule of the time required for the execution of various tasks which the auditor has traditionally had to regulate his behavior. Former patterns of temporal consistency and limits are no longer applicable standards in evaluating performance and the audit team is being allowed a much greater degree of freedom in the performance of audit tasks. Associated with this change is an observable breakdown in the norms of audit

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2 This preliminary statement does not mean to imply that no procedural changes are occurring in the audit process as a result of the computer. Further analysis of the changes which are actually occurring or are likely to occur will be made at a later date.
procedure evaluation. Often, it becomes impossible to maintain a structural hierarchy of review, and the lower echelon auditor with superior technical knowledge is not under the supervisory pressure that he felt so strongly in pre-computer audits. The lack of such pressures is yet another pre-condition for the breakdown of the institutionalized role of the auditor.

In speaking with auditors involved in the transition to computer auditing, it became apparent that they were experiencing two general sort of reactions to this breakdown in norms regulating their role. Some experienced this breakdown as an intense role conflict. Such individuals noted that the overall transition to the computer had created a situation for them in which the structure of their work was ambiguous. Because of this they felt uncertain of what they could accomplish and of the overall effectiveness of the auditor.

For other men with whom we spoke, the breakdown of traditional auditor role structure had had a liberating effect. These men saw the computer audit as a creative experience in which they had an opportunity to exceed the structural limits which had been present in manual audits. For them the conditions present in the computer may have been ambiguous, but they were not felt as situations of conflict. Rather, these were viewed as the necessary prerequisites to innovative adaptation to highly discrepant and variable conditions. They saw the computerized audit as offering them the maximum opportunity for creation within the confines of their professional functions.

The possibilities of reaction and adaptation to variable sets of new conditions such as those described above still remains for us an open question. To date, our data collection has been limited to a series of general discussions about the computer and its effects on the audit process, and we have not as yet dealt thoroughly with the individual auditor and his reactions. There remains for us the necessity of examining the various patterns of adaptation by individuals to both the conflictual and creative aspects of computer auditing. We must address the various ways in which men are adapting to the ambiguity in their traditional role performance which the computer has created. A large part of this problem will be the documentation of the ways in which such adaptation is occurring. It is hoped that we will be able to pursue these questions through more interviews with auditors of the same sort we have already met. We are focusing our initial set of questions with the idea of individual problems of role adjustment foremost in our minds.
APPENDIX A

Bibliography of Books and Articles
Read in Connection with Research to Date


Macrae, Edwin W. "There is a Computer in Every CPA's Future," *CPA Quarterly*, XXXIV, (December, 1966), Number 3, II.


APPENDIX B

Additional Questions Regarding
Changes in the Profession

A. Have there been any changes in the field of accounting in the past 10 years? What are they? How would you describe these changes?

1. Probe: Automation.
2. Probe: Principles and postulates.
3. Probe: Quantity of recruits.
4. Probe: Quality of recruits.
5. Probe: Basis of attraction of recruits.

B. Have you yourself been affected by the changes in the profession you have outlined?

1. (If No):
   a. How have you escaped these changes?
   b. Do you expect that you will soon be affected by them?
   c. Are you concerned about the impact the changes may have upon your skills, knowledge and opportunities in the future?

2. (If Yes):
   a. Are you concerned about the impact of the changes upon your skills, knowledge and opportunities? (Other).
   b. What have you done and what are you personally doing to meet the changes (such as job shifts, educational efforts, etc.)?
   c. What more do you plan for the future?
   d. How sufficient do you view these personal efforts to have been?

C. Is the problem of change for you made more or less urgent by the type or nature of your clients? Why?

D. Have you seen any new specialties emerging in your profession over the past fifteen years?

1. (IF YES) How do these specialties differ from the traditional field?

E. Do you think there are significant changes in the practice of accounting when one works in management services?
F. Do you have any feelings about which M.S. services accountants should stick with or which ones they should not offer?

G. Can you see any particular danger or problem in allowing CPA firms to expand into these services in any direction they choose?

H. How involved is your firm in management services?

(IF MODERATELY OR HEAVILY INVOLVED):

I. How acquainted are you with the M.S. services your firm offers?

THE FOLLOWING QUESTIONS ARE FOR THOSE WHOSE FIRM IS AT LEAST MODERATELY INVOLVED IN M.S. AND FOR THOSE WHO ARE AWARE OF THEIR FIRM'S INVOLVEMENT.

J. Which of the management services does your firm not now offer which other firms do offer?

K. What is the percentage breakdown of type of services your firm now offers in terms of formal or informal designations?

L. [IF ALL SERVICES ARE INFORMAL]: How do you bill for them? [ASK "M" AND "N" IF APPLICABLE]:

M. Have you ever contemplated or made an effort to formalize the management services you now offer?

N. What have been the obstacles to formalization?

O. Is there any principle used by your firm to determine the extent of its involvement in M.S.?

1. (IF YES)
   a. What is it?
   b. Why do you think this position is taken on the issue?
   c. Do you think the members of your firm feel differently about this problem than they did, say, ten or fifteen years ago?

P. How do you (or your firm) let clients know you can render services other than audit or tax? How successful are you at this? What obstacles do you face?

Q. What effect do you think the management services sub-specialty has had upon the audit process and upon auditors?
R. What effect do you think auditors and auditing have had upon the manner and quality of formalized management services rendered by CPA firms?

S. How successful have you (or your firm) been in motivating non-CPA men to become accountants as well?

[FOR ALL REG'DLESS OF INVOLVEMENT IN MS]:

T. Have you ever heard the term "constructive services?"
   1. Probe: "Management letter"
   2. (IF YES) What does it mean?

U. Have you ever heard the term "constructive audit?"
   1. (IF YES) What does it mean?

V. [IF YES ON EITHER "T" OR "U"]: How do you view the relationship between "constructive services" or "constructive audit" and managerial services? Where does one stop and the other begin?

W. What are the advantages-disadvantages of entering management services in comparison to more straightforward audit-tax work? [Clarify: Advantages-disadvantages for the CPA].
   1. Probe: Advantages for CPA in management services.
   2. Probe: Disadvantages for CPA in management services.
   3. Probe: Advantages for CPA in audit-tax work.
   4. Probe: Disadvantages for CPA in audit-tax work.

X. I have been told that audit, MS and tax work have quite different appeals to those in them. Do you think this is true?
   1. (IF YES) Could you describe the different appeals you see them as having?

Y. I have heard that audit, tax, M.S. (informal and formal) work attract different types of people. Do you think this is so?
   1. (IF YES) Could you describe these differences?