

A MODEL FOR AUDITING QUALITY CONTROL SYSTEMS

AN EXTENSION OF MANAGEMENT AUDITING

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Introduction

Perhaps earlier than, but certainly during the decades of the 60's and 70's, the golden age of the history of the so-called a priori research in accounting and auditing has taken place(1). Although some authoritative works in this area of a priori research have been declared as theoretically deficient and it is possible "to declare the superiority of just about any set of accounting procedures, depending on the particular a priori model adopted"(2), it can be argued that such a criticism is based on a serious misunderstanding of the role of this type of research in the overthrow of outdated ideas and practices. Far from being unproductive or of doubtful value, this type of research is a necessary step in any scientific revolution(3).

It should be emphasized, however, that the revolutionary metaphor used here may be applicable only to accounting and auditing thought. Given the political difficulties of initiating

(1) Churchill's dissertation and several other studies conducted by Churchill and three co-authors (Churchill and Cooper, 1964, 1965; Churchill, Cooper, and Sainsbury, 1964; Churchill and Teitelbaum, 1967) constitute one of the better examples of a program of research in auditing.

(2) Gonedes and Dopuch (1974, pp. 49—50).

(3) The notion of a revolution is taken from Thomas S Kuhn's monograph (1970, p. 7).

change in accounting and auditing practices, that may well be an evolutionary rather than a revolutionary process. But that evolutionary process will not take place until the revolution in thought is complete.

Conceptually and practically, the audit investigation can be extended in various directions. In recent years auditors have been urged to extend their activities to various subject matters in which credibility might be enhanced by audit. The subject matter of any extension of the audit function must, according to the Committee on Basic Auditing Concepts (1973, p. 14), possess the following attributes(1):

1. The subject matter must be susceptible to the deduction of evidential assertions. Such assertions must be both quantifiable and verifiable.

2. An information system must be present to record the actions, events, or result thereof; preferably adequate internal controls will also be operating.

3. Consensus must exist on the established criteria against which the information prepared from the subject matter can be evaluated.

(1) One can easily discover that the committee is, in fact, echoing the call by Burton (1968, p. 41) to construct a framework for the management audit.

In addition to these attributes, two further conditions are needed, and these are(1) :

1. Competence of the auditor. Auditor's competence is an important constraint on the subject matter of an audit. Whether the subject matter can be broadened will depend, in part, on the auditor's gaining the necessary expertise(2).

2. Reportability. There must be a report which includes an opinion on the results of the comparison of the information presented against the established criteria. Such a report must be a competent reflection of the findings of the auditor. Before any extension of the audit function into new subject matter can occur, report language must be developed and agreed upon [by the profession. If the report does not communicate satisfactorily the findings of the audit, it may fail to fulfill the intent and thus render the auditor's preceding work of little worth. No matter how thorough and effective the auditor is his effort will go in vain if he cannot clearly convey the results of this effort in a useful form to those who need to know them.

It should not pass without notice, however, that the comm-

1. Idem. This presentation paraphrases that of the Committee.

2. Kreiser (1977), for example, discusses the structure of different programs for upgrading CPA audit competence and attempts to measure CPA and user reaction to the effectiveness of eight such programs. In addition, several professional com=

itee has unfortunately restricted its understanding of the role of audit function within the communication process associated with accounting information, and that it has been convenient for the committee to illustrate auditing methodology with traditional financial accounting concepts and techniques(1). This attitude has greatly influenced the committee's views on matters relevant for consideration for the extension of the attestation function (for example, auditing the planning function).

Motivation of the Study

A question that might appropriately be raised at this point in the conduct of inquiry is why have we selected this area as an extension of management audit and then subject it to our close scrutiny? The answer to this rightful question is largely

committees as well as individual authoritative studies have endorsed Roy and MacNeill's Common Body of Knowledge (1967) as authoritative for the purpose of specifying the required body of knowledge that each CPA should have upon entering the profession.

1. The committee has adopted this view in spite of the accountants changing their methods in response to computer-based Management Information Systems design alternative, and the growing demand to extend the attest function in anticipation of society's and management's increased demands for audited information. See, in support of this view H. J. Will (1974, p. 693).

pragmatic, but we hasten to say that the rules developed here are no less significant or general, for, to quote a phrase by Chambers (1966, p. 371), "every specialism is significant simply because it is limited". The pragmatic reasoning behind the selection of the area of quality control was to enhance its chance for playing its useful role in socio-economic affairs.

It has been noted that mass production has enabled our society to produce more goods at lower cost and, in many cases, lower quality than previous methods of production. The growing trend toward an industrialized society provides ample justification for greater emphasis on quality control aspects of production.

There is a tremendous outcry, nowadays, about the deficiencies of the quality of national products as compared to that imported from foreign countries. The situation has been under observation for long time, but the relatively easy new import policies have made it imperative that the current efforts with regard to quality control must be seriously appraised and revamped if the national industry is to survive in the face of this fierce competition.

Although the science of management provides a necessary part of the premises of choice in the area of quality control, it does not provide the whole. The factual premises of choice are provided by many streams of information, notably, accounting. Since the administrative approaches have not been sufficient in the past, it appears that the atmosphere is ripe for a fresh outlook to be supplied by another discipline.

Historically both internal and external auditors have refrained from including quality control in the scope of their audits. One major reason auditors neglected this field was probably the technical nature of a quality control operation. As a result, quality control has remained an area of which auditors have little knowledge. Nevertheless, it was recently noted by R. Keenan :

“ While it is apparent that the usual background of an auditor would not qualify him as an expert in technical aspects of this area, there is no reason whatsoever why he cannot review it from a business point of view ”(1).

Formal guidelines for developing a quality control audit program do not presently exist. Definite responsibilities and objectives have not been formulated in the area by professional institutes (e.g. the AICPA & The Institute of Internal Auditors). Therefore a public accounting firm (or an internal organizational subsystem) that desires to audit a client's quality control system must develop its own policies and procedures. This study shall attempt to fill the gap that presently exists in the auditing literature regarding responsibility, activity and procedures in the operational quality control audit(2).

(1) Edward F. Norbeck et. al. (1969 p. 115).

(2) It should be noted that quality control itself is essentially an audit of other people's performance. Therefore, auditing quality control systems may properly be termed “ audits on audits ”.

Research Methodology

If the view that accounting is an empirical science is accepted, then auditing should be more so. However, the purpose of empirical science is not limited to passively observing the behavior of the empirical system (1). The researcher attempts to control the empirical system so that its behavior is more beneficial to human beings. Normative models (as opposed to descriptive models) are developed to move the state of the empirical system closer to the norms or goals that the researcher has in mind. Research methodology involved in developing descriptive models is two fold, namely,

(1) empirical observations, and

(2) induction

In contrast to the process of observation and induction that is involved in constructing descriptive models, the process involved in constructing normative models may be characterized by (2):

(1) goal assumptions, and

(2) deduction.

(1) Ijiri (1975, p. 6)

(2) Ibid, pp. 7—8

It is clear that the state of the art does not warrant a clear process of induction in the area of quality control, since audit programs for quality control do not presently exist either in industry or accounting firms (not even at the Central Accounting Agency in Egypt). Therefore a deductive process seems to be in order. Accounting and auditing literature, as well as other disciplinary literature, provides much of the needed research data.

Operational VS. Management Auditing (?) of Quality Control Systems

Increased managerial delegation of authority fostered the development of operational auditing by producing a need for the following information :

1. Determination of performance effectiveness in each delegated functional area.
2. Establishment of potential impact of breakdowns in specialized functional areas of operation.

The contexts of the terms operational auditing and management auditing have not been clearly stated or differentiated in the literature(1). Management consultants, for example, have used the term management auditing in the context of organizat-

(1) See, e.g., H. Q. Langenderfer and J. C. Robertson (1969 p. 777).

ional evaluation for the purpose of defining and explaining problem areas(1). Some Certified Public Accountants (i. e., independent auditors) have employed the term to refer to similar usage with reference to management services engagement(2).

Internal auditors, too, frequently refer to their internal audits, or operational audits, as management audits(3). The distinguishing feature of the uses referred to in all these studies is that in each case the audit engagement is in the nature of an audit for management. Independence is not considered to be particularly relevant to such audit examinations as these.

In a chapter titled "quality audits", Hagan (1968, p. 200) asserts that "too many managements are so busy getting things done that no one is overly concerned with how well they are being done. To even consider — let alone tolerate — measuring management's effectiveness is unheard of". Therefore, we present other authors view who describe operational auditing from the point of view of the independent auditor. Neil Churchill and Cyert (1966, p. 39) recapitulate management auditing as "an audit which results in a statement of opinion by a Certified Public Accountant with regard to performance of management functions". This definition of management auditing is framed in the context of independent attestations of management (probably for the benefit of third parties).

(1) R. I. Levin (1968, pp. 60—68).

(2) Arthur E. Witte (1967); John L. Carey (1965).

(3) William L. Campfield (1967); Warren B. Coburn (1966).

For our purpose here we have adopted the view that differentiates between management auditing and operational auditing from the angle that sees the first as auditing of management and the later as auditing for management(1). For the specific purpose of developing an audit program for quality control systems, we see no particular relevance for the fact that the audit program may be developed and carried out by an independent auditor for the benefit of third parties or management itself or by an internal auditor performing the audit for the benefit of management. Therefore, we shall use the terms operational auditing and management auditing interchangeably to refer to the logical contents specified at the outset of this section of the paper.

To recapitulate, the purpose of this effort is to explore the operational auditing of quality activities. Emphasis will be placed on :

1. Determination of the accountant's role in operational quality control audit
2. Developing guidelines which an auditor can follow when creating or revising a quality control audit program.

(1) See, e. g., T. Burgess (1971, p. 7—12); C. H. Smith, A. Lanier, and M. E. Taylor (1972, pp. 270—283).

External Auditor's Role in the Operational Auditing of Quality Control Operations

Traditionally the primary interest of a public accountant has been centered around the elements affecting the financial statements of his clients. Although the effectiveness of some operational procedures may be insignificant in their effect upon financial statements, ineffective quality control procedures may have the following indirect adverse consequences on financial statements(1):

- 1 — An increase in customer returns and other adverse effects in customer relations ,
- 2 — Decrease in sales due to poor product performance
- 3 — Excessive re - work cost for defective material
- 4 — Costly rehandling and shipping charges
- 5 — Excessive production costs with correspondingly low profits

Ordinarily, financial audit will be performed on Quality Control Department only if it is selected for review through a statistical survey, or if a question exists as to the reliability of balances appearing in the financial statements (such as inventory or production costs). If the Quality Control Department is selected for review, the financial audit would usually concentrate on the following two areas :

1 — Sdword Norbeck et, al., op at. P. 116.

1. The financial costs of a Quality Control Department, such as salary, supply cost, depreciation expense, ... etc.

2. The quality control effectiveness in the determination of the sales returns and allowances.

It is clear, thus, that Quality Control Departments (if audited at all) are audited from a financial rather than an operational viewpoint(1). Operational auditing is directed toward the future by measuring progress toward enterprise objectives, whereas financial auditing analyses the past by reviewing accounting transactions.

An operational audit should reveal the inherent weakness existing in a quality control system and should, in turn, reduce the above adverse effects on financial statements.

An Operational Auditing Model Program For Quality Control

In order to adhere to management's philosophy, quality control activities should be continuously scrutinised and modified when necessary. This section will provide the auditor with a guide to either developing or revising an operational audit program of quality control activities.

(1) The general consensus prevailing now is that operational efficiency is an internal audit function and that quality control audit responsibility lies primarily with the internal audit staff.

Failure of a Quality Control Department to achieve management's quality control goals and objectives may be caused by inadequate systems and procedures and / or by non-compliance with systems and procedures by quality control personnel(1).

Audit procedures presented here are intended to detect weakness in both structure and implementation as they exist in Quality Control Departments.

In order to provide broad base for the auditor, some basic quality control audit functions are presented. The broad audit functions are to be used as general guides when creating a quality control audit program. The procedures are presented for a transition to the practical application of such functions, and they are intentionally presented in very broad terms to serve as a general model for a quality control audit. The presentation is made in accordance with the spirit that an audit program is a medium for having an organized procedure.

I. (Preliminary Step) : Familiarization With Quality Control System and Quality Control Management Objectives.

Quality control is a function with which most auditors are not familiar. Therefore a thorough review of quality control system and management objectives regarding quality control (what top management considers to be the objectives of a quality control function) is necessary prior to development

(1) The later aspect is usually called a compliance or procedure audit. See, e. g., Barefield (1975, p. 1).

of an audit. The main judgmental factor to be considered in quality control management objectives is the assessment of risk in relation to cost.

The process of familiarization is specifically undertaken at the commencement of an audit. It, then, becomes an automatic process as the audit continues. Initial familiarization is performed to give an auditor data relative to :

1. Organization of the Quality Control Department
2. Operational duties and responsibilities of personnel
3. Type and flow of work
4. Skills required of inspectors
5. Techniques used
6. Inspection frequency
7. Nature and type of reports issued.

The procedural arrangement to carry out this preliminary step may now be proposed :

- A. A meeting with top management and quality control officials should be scheduled.
- B. Formal quality control objectives should be formulated or revised by top management subsequent to the above meeting and circulated to quality control officials.
- C. Obtain desired information about the operations of the quality control system (organizational chart, job des-

criptions, operation procedures manual, and any form, test, and report relative to quality control activities).

D. Achieve physical familiarization by examining the participating organizations with regard to their responsibility for product quality(1):

1. Interview the quality control key officials
2. Interview sales officials (specifically those handling customer service so as to determine the Sales Department's reaction to product quality).
3. Interview key product engineering officials (to ascertain their opinion of whether quality control is maintaining the quality level in product design).
4. Interview design personnel (to determine their opinion of product design quality effectiveness).
5. Interview procurement agents (to determine engineering print adequacy and also to check that Procurement Department follows up on vendor quality problems and documents).
6. Tour general plant areas (to become familiar with the physical operations).
7. Observe methods and equipment used for inspection

(1) for a detailed description of the participating organizations and their prime quality responsibilities, see; Hagan, op. cit., ch. 2 (especially the Exhibit on page 31),

8. Review sampling procedures employed by the Quality Control Department.

E. After quality control objectives are agreed upon, and familiarity is achieved, the audit plan (objective, purpose, scope, basic approach, responsibility) should be formulated, and this may appear as follows :

1. Objective—to achieve an effective quality control system (in conformance with managerial quality control objectives).
2. Purpose — to determine :
 - a) the functional adequacy of the quality control system in achieving management quality control objectives
 - b) the measure of adherence to the prescribed quality control system(1).
3. Scope—to review the established quality control systems and procedures (in conjunction with evaluation of the internal control system). Inspection may cover :
 - a) functional adequacy of quality control organizational structure.

(1) When quality audits are limited to the instructions contained in a quality procedure - as often happens - they are not likely to improve on the intent or objective. Vide, Hagan, op. cit, p. 203.

- b) tests of recording accuracy
- c) contract specifications requiring compliance
- d) reports utilized by management (in evaluating the accomplishment of assigned objectives).

4. Basic Approach — the audit program may be developed in outline fashion before starting the tests(1). (The initial outline must be sufficiently detailed to give the auditor direction, but not so detailed as to impede judgment).

5. Responsibility — the Internal Audit Department or a separate unit specifically created to audit quality control or an external auditor may perform the audit(2).

(1) The basic approach for the preparation of the audit program varies in detail from one situation to another. See, e. g., Nielsen (1971, p. 10—13).

(2) Compare this to the managerial approach to quality audits where it has been customary to make a separate organizational segment of the quality control function responsible for reviewing the balance of the organization's performance. Vide, Hagan, op. cit., ch. 10.

II. Evaluating the Functional Adequacy of the Quality Control System.

The auditor should attempt to ascertain whether functions being performed (by quality control personnel) are sufficient and effective to achieve quality control management objectives.

During the evaluation stage, the auditor should make note of possible methods of improving the system and procedures, and suggest approaches to corrective action.

upon completion of his evaluation, the auditor should be able to form an opinion as to both the overall functional effectiveness of the prescribed quality control system and procedures for achieving quality control management objectives.

The procedural arrangement for carrying out this step may be prescribed in the following terms :

A. Quality Control Organization — review the organization of a quality control function relative to the structure of a Quality Control Department in order to ascertain that:

1. The number of inspectors is sufficient.
2. Shifts are fully manned.
3. A clear — cut transfer of responsibility takes place among inspectors on various shifts.
4. Qualifications of inspectors are adequate.
5. An adequate program exists for educating inspectors.

6. Management has an effective means of evaluating the inspector's performance (analyze feedback from customer returns of defects which slipped through the inspection routines, analyze accuracy of quality reports with reference to fabrication work).
7. A mechanism is established for holding inspectors clearly accountable for failure to catch defects, and an attempt is made to hold inspectors financially responsible for inspection failure.
8. Who has responsibility and control over quality control procedures
9. Inspection Department has authority to stop a production run (if excessive rejects are occurring)
10. A quality control official or a quality review board determines the disposition of salvage parts.

B. Inspection Process and Procedures — determine whether :

1. Inspection Department has adequate facilities (equipment and layouts)
2. A time schedule has been established for colibration of inspection equipment.
3. Inspectors are furnished with clearcut instructions (formal inspection procedures).
4. Effective use is made of statistical sampling (whether statistical sampling is used depends upon the nature of the product)

5. Rejected materials are clearly identified and properly segregated.
6. Records maintained by the inspectors are sufficiently detailed to permit an evaluation of the extent of work performed (tally sheets may be used to record results of quality — pattern tests).
7. Timing of the inspection process has any delaying effect on production.
8. The Quality Control Manual adequately covers all aspects of the inspection process and all things to be inspected (finished products, parts, raw materials, packaging materials).

C. Defects Prevention — the effectiveness of defect prevention system is ascertained by determining :

1. Whether rejection slips are adequately prepared.
2. Whether methods in effect for distributing the copies of rejection records are adequate.
3. Whether Inspection results are communicated to management for review.
4. Whether re — work, scrap, and warranty costs are summarized according to work centers (the degree of summarization will depend upon individual circumstances).
5. Whether prompt action is taken on rejected work to determine whether it must be reworked or scrapped.

6. Whether corrective action meetings are regularly held to handle special problems.
7. Whether causes of rejections are recapitulated to serve as a basis for a corrective action program.‡
8. Whether a “Zero Defects” program (if pertinent) has been implemented.

III. Evaluation of the Adherence to the Prescribed Quality Control System.

The auditor should attempt to ascertain whether quality control systems [specified (and may be outlined in a quality control manual)] are adhered to. If a quality control manual is not maintained, the auditor should request quality control management to prepare an outline of the procedures which they feel are supposed to be in effect. Quality control systems and procedures in the manual can be used as standards against which actual operations are compared and variances are discovered.

Where departures from the prespecified systems are noted, the auditor should attempt to evaluate the causes behind these departures (are they the result of incompetence of personnel or the inadequacy of the prescribed systems and procedures).

The procedural arrangement required to carry out this step (appraisal of adherence to the prescribed quality control system) very much coincides with that arrangement detailed in the

preceding step (appraisal of the functional adequacy of the quality control system). For that reason the two steps may, operationally, be combined, although the auditor still has to report results of both steps separately to avoid any misunderstanding as to the reasons for deficiencies in the quality control Department.

IV. Discussion of Quality Control Audit Findings.

A primary objective of an operational quality control audit is to provide for constructive criticism. A discussion of the quality control audit findings furnishes the opportunity for an informal consultation between the auditor and the quality control management. The main line of discussion should center on necessary improvements and corrections to achieve greater effectiveness. The auditor should make every attempt to ensure that improvements and corrections agreed upon during the discussion period are carried out.

The procedural arrangement required to carry out this step takes the form of holding a meeting with quality control management to discuss the feasibility and methods of :

1. Reducing defects
2. Improving quality control procedures
3. Adding and reducing procedures where necessary.

V. Quality Control Audit Report.

The audit report is a communication device designed to convey facts and information to interested parties. It expresses the auditor's professional judgment on the subject matter of the audit. To write a good audit report requires more than a thorough knowledge of accounting and auditing. It calls for considerable skill in marshaling facts and expressing conclusions in correct, current, comprehensible, and dignified yet persuasive language(1).

In order to ensure clarity and correct interpretation, the sections in the audit report on audit findings and opinions should be divided into two parts: the appraisal of functional adequacy of the quality control system, and the appraisal of adherence to specified systems and procedures.

The procedural arrangement necessary to carry out this step may be presented as follows:

A. Arrangement of Content — the formal audit report may effectively be prepared in the following order:

1. Purpose of audit
2. Scope of audit
3. Limitations of audit
4. Findings of audit:

(1) Jennie M. Palen (1971, p. 41—2),

(a) appraisal of functional adequacy of the quality control system

(b) appraisal of adherence to the quality control system.

5. Opinion regarding :

(a) functional adequacy of the quality control system

(b) adherence to the quality control system.

6. Conclusions of audit.

7. Recommendations of audit.

B. Forwarding the Report — the following people should be sent a copy of the audit report :

1. Chairman of the Board of Directors

2. Head of the Finance and Administration Area

3. Production manager

4. Marketing manager

5. Purchasing manager

6. Other key managers

7. Others (third parties if required)

VI. Supplementary Review for Corrective Action Assurance.

In operational auditing, the auditor's responsibility is not discharged until he has determined that the actions recommended and agreed upon by management have been carried out. Specific follow — up activities should be undertaken to ensure that recommended corrections have been instituted. Quality control officials should be held accountable for implementation of recommendations by a specific date. The auditors who performed the original quality control audit should conduct a supplementary review of corrective action shortly after the target date assigned for corrective action implementation.

The following procedural arrangement may be presented to carry out this step :

1. The quality control audit report includes a date for corrective action.
2. A follow — up for correction verification is performed
3. Another formal audit report is initiated if follow — up reveals any remaining uncorrected situations.

Summary and Conclusion

Research in the field of management auditing has now by-passed the era of being described as a priori research. If this is an indication of any thing, it is an indication that the field of management auditing has gained wide acceptance and it has proven its usefulness. In this paper we have proposed to extend this field to cover auditing the quality control systems.

The motivation for the study rested primarily on pragmatic considerations. Product quality level has been one of the main issues hindering the growth of the national industry and blocking the international markets in the face of national products. Therefore, a fresh approach to evaluate the quality control efforts is in order. Accordingly we have proposed a model audit program for auditing quality control systems. The model proposed some basic principles (in the form of steps to be followed) and, then, as a transition from theory to practice, moved to provide the procedural arrangement necessary to translate these principles in practical terms.

It is believed that the educational qualifications specified in the Roy and McNeill's Study as well as some later authoritative studies provide the necessary [background to enable the auditor to venture into such a field

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