

THE ADAPTATION OF CONTROL METHODS TO AN AUTOMATED ACCOUNTING SYSTEM

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Introduction

In an international discussion on the methods used to control the preparation of accounting records there is a danger that misunderstandings may arise through differing conceptions of the precise meaning of certain definitions and because different countries hold different views on the best way in which controls can be effected. However, the controls must in any case meet with the approval of the independent control expert (auditor) whose duty is to certify the annual accounts in respect of the control and employment of capital and the preparation of the profit and loss account. Interested third parties require assurance that a company's annual accounts fully reflect the true position. Similarly, company management require assurance of the accuracy of the financial records upon which they base many of their decisions. Control is also needed where authority is delegated to protect the management responsible for the delegation.

Development of the modern accounting system

In recent years companies have seen a rapid development of the methods used to process their records and data. As with many technical developments, these new methods originated from the mechanisation of existing manual activities. There has been little change, however, in the basic principle of producing final statements from interim results. The conventional punched card machine took over whole sections of office records, orthodox accounting systems being built up on the basis of one punched card for every item of data. The need for speeding up the processing of data led to the introduction of new methods for dealing with input and output. Advancing technology produced means by which data could be recorded in magnetic cartridges on tape or on disc memories from which it could be rapidly read, filed or processed. However, these tapes and disks could not be read by humans. This created difficulties in control, because the controller's access to the data was made difficult or impossible. At the same time possibilities developed for expanding the processing of data. Machines operated by switch panels were superseded by the computer in which the data are processed by a program fed into a built-in memory. The capacity of the memories was quickly developed by increasing their size and efficiency, so allowing integrated process specifications to be taken up. In previous manual methods, practical considerations had made it necessary to split work up into sections which were then summarised periodically. The computer made new methods possible, so that the work could be completely processed in one run. The system of making monthly summaries could, if wished, be replaced by the "real time" method where information is grouped permanently on a continuous basis, obviating the need for historical summaries. This can make reconstruction of a process more difficult. Developments for the future are aimed at creating one complete system frame work, so that the accounting records will form part of the whole data processing system. Far too often the needs of supplementary non-accounting data are neglected. The computer, when used as an aid to decision-making by management, often needs information not directly related to accounting matters.

The new technical developments can influence the system of accounting in two ways:

- 1 Development of the accounting organisation by building the new machines into existing procedures, so that their influence is felt throughout the entire accounting structure. This is the phase with which most companies are concerned at present.
- 2 The influence of the new machines will eventually become so great that new accounting systems will have to be created. In other fields technological advances have brought about new methods, which would have been inconceivable without the new machines. An example in the field of company management would be the many possibilities rising from an overall information processing system with built in indicators showing optimum points and guiding management decisions.

From the point of view of the auditor it is important to determine the stage of development which a company has reached. Problems are not confined to individual machines, in the future problems will multiply as new methods and systems are brought in to keep pace with advances in machine design.

The execution of the auditor's function

When discussing the influence of all these developments on the profession of the auditor, a distinction must be made between his function and his work.

The function relates to the underlying principles of the profession, the work stems directly from the function but is conditioned by the circumstances in which the job is carried out.

The function evolves from a company's need of an independent expert who can give an objective opinion about the information shown in the annual report and accounts. This function remains unchanged - interested third parties are not concerned with the method used to collate information, only whether the end product presents a true and fair view. There will, however, be a change in the way in which the controlling body carries out its duties, as the development of new machines makes its influence felt.

Audits will be founded on the basis of a study of the internal organisation, which will include the accounting organisation and the internal control system. From this study the auditor will prepare his own work programme. If the organisation and internal control fulfil normal requirements, and it can be established that they have functioned reliably throughout the period under review, then a minimum work programme will be sufficient.

There will therefore be an increase in the already well established trend of auditing the accounting records with regard to the office organisation, internal control and statistical reviews. In the past it was the practice that where shortcomings in any section of the organisation became apparent, the auditor would perform all the necessary supplementary checks on that section at an early stage of the audit. In our opinion an automated accounting system makes it impractical for the auditor, with the means at his disposal, to conduct full supplementary checks on isolated sections of the organisation. This means that the auditor cannot carry out his supplementary checks even when he is not satisfied that the office organi-

sation and internal control fulfils all his requirements. Continual review of controls during the creation of a new system is therefore essential.

The practical execution of the auditor's duties raises the following points.

First and foremost it is obvious that the technical advances are detrimental to certain aspects of the auditor's work. Other important aspects concern, inter alia, control on the valuation of assets and liabilities and verification of their respective existence and completeness, inspection of the budget and the individual control of exceptional items.

In the audit of an automated accounting system the following two factors are important:

- 1 A control system as an integral part of the total system.
- 2 The control within the computer area.

1 The control system

A *system* is a framework created by using simple logical rules to consolidate the individual procedures governing a related series of activities. The "procedures" can be e.g. planning, stock records, transport, statistics, sales ledger etc. Each procedure is built up from general rules. Systems analysis means looking for general rules. Exceptions should be avoided, or if they are significant special rules should be made for them. Procedures are joined together by a network of "lines of influence" which combine the procedures to one integrated whole. Into this whole must be built a number of control measures to give the system the requisite reliability. The auditor can only judge the effectiveness of the overall control system by looking at the part played by each individual control in relation to the whole integrated control system. The development of the control system should be incorporated into the development of the system as a whole. The auditor must be able to judge the basic principles of the system and to recognise the critical control points. Documentation in the form of written specifications, which for several reasons must be used with great care, will be available to him. The systems analysis starts with a general plan of the mechanisation, showing the detailed framework of individual projects. The documentation must be easily accessible and well set out, so that it can be understood by laymen. This is essential for ease of communication and for proper assessment whether data are being processed accurately and comprehensively. The overall control system will be founded on a number of organisation measures which are necessary, in any accounting system, in order to form a reliable basis for the individual controls. Such measures would include adequate division of duties, budgetary control etc. We define a control system as the chain of control measures which is necessary to hold the main system together.

In an automated system the basic data are first recorded once and for all in a medium the machine can read. All processing follows from this operation, so great care must be taken to ensure effective and timely control of the accuracy, completeness and homogeneity of the input data. This can be done visually via a control list and/or by means of a number of programmed controls involving screening of the basic input material.

There will be a check list in the form of a detailed print out of the input data taken up into the machine, including control totals for comparison with pre-lists where necessary. After verification, totals of homogeneous data groups will be

entered in a control register so that further processing can be checked back. Where necessary detailed check lists can also be prepared from the total control lists. Control of data via the computer program holds many possibilities. Accuracy of individual codes can be controlled by self checking numbers or by sequential checks. Nil controls can be used whenever two sets of data must agree arithmetically with each other (e.g. total job time = shop time). Program checks can also be made where the data are in a special sequence, or where groups of data are related in any way. An important group of program controls is the "probability controls", where mistakes can be detected by use of maximum and minimum limits. Because the computer cannot itself make an intelligent appraisal of the data, the probability control is an important method of evaluating input data with output. In this way any items not conforming to the standards laid down in the program can be high-lighted.

To achieve an efficient control system all data must pass through a rigid system of channels, so that all corrections of input go through the whole system and do not enter the computer by a "side route" halfway through the process.

The control system will make full use of all logical relationships between types of data - e.g. the relationship between fiscal and quantitative values. This can be done by using total controls either from the control register or built directly into the program. In practice the control measures will be carried out by an official who has the complete independence necessary for the function. The external auditor will also cover the control system in his work program, but because an adequate review of the system requires regular expert observation of the operations he will have to make full use of the work done by the internal controllers.

Control within the Computer Area

In the future more control will be needed in the field of computer programming and operating. This will take the form of a supplement to the general control system, and the measures to be taken will be aimed at two main requirements:

- a. the certainty that the program is accurate and complete.
- b. a guarantee that the computer operations are being carried out accurately and completely.

The basic necessity for both controls is a good division of responsibilities between programming, computer operation and storekeeping.

Requirements (a.)

The first check on the computer program will be made by the programmer himself when checking his work for possible errors and inefficiencies. The program must be simply constructed without unnecessary complications and should be written in an easily readable language capable of being understood by other programmers. Important programs should be checked through by programmers who had no part in writing the original. The program should finally go through an acceptance procedure, involving comprehensive test cases compiled by the departments concerned, working in liaison with the internal control department. The results of the test cases will have been calculated and recorded beforehand. The program can be built in sections, so that each section can be tested individually before the program is tested in its entirety. The calibre and discipline of the programming staff is of great importance, especially as complete control over program preparation is al-

most impossible. Alterations to programs create many difficulties in practice. Program alterations must be tested in the same way as new programs, and the paperwork must remain well ordered and complete.

The preparations of an adequate series of program tests requires knowledge of how the program has been produced and of the purpose for which it will be used. The auditor must satisfy himself that the utmost care has been taken in the preparation and execution of the program tests.

Requirements (b.)

The following points are relevant to the operation of the computer. There must be a division of functions between planning, storage and registration of programs, computer operation and internal control. Strict instructions must be laid down.

The latest developments in programming can produce a high degree of automatic operation, with a consequently significant reduction in the incidence of mistakes arising through human failure. The console logbook, showing details of machine breakdowns, data files used, instructions passed through the console etc. can also be mechanised. The logbook provides a record of the operations performed, and also has an important function as a means of reconstructing data. The need to be able to reconstruct data makes a specific destruction procedure necessary. In the case of magnetic tapes this procedure follows the "father and son" principle, which ensures that reconstruction is always possible.

The handbooks and instructions given to the operating departments will be available to the auditor, who will have to satisfy himself that the instructions are in accordance with control requirements and that they are in fact carried out in practice.

Conclusions

a. The Audit

- 1 A computerised accounting system does not affect the function of the auditor, but does affect the work he performs, i.e. the type of audit measures he can carry out.
- 2 The framework of an automated accounting system must include an unbroken chain of control measures. This control system is the basis of all control.
- 3 The auditor must be given the opportunity to assess control aspects as they arise during the development of new systems.
- 4 The auditor must acquire an expert knowledge of systems and control systems in order to be able to make this assessment.
- 5 The control measures flowing from the control system must be systematically carried out by the responsible staff. The auditor must satisfy himself that the system in general is functioning properly, and must pay special attention to the major points of control.
- 6 The auditor's control programme will be based on the control system.

b. Internal control

- 1 Whether automation strengthens or weakens internal control is a question of organisation. A well designed automated system supported by a good control system can lead to an improvement in internal control.

- 2 Internal control acquires a broader concept in an automated system, in that the stream of accounting data is integrated with the main flow of information. New links with non-accounting data provide fresh properties for internal control.
- 3 Automation permits a wider classification and summarisation of statistical information from the same basic data. This in turn permits better assessment of departmental performance, with a consequent improvement in the accuracy of the original basic data. As all summaries originate from common data, a control chain can more easily be linked together.
- 4 Automated systems speed up the flow of information, allowing reviews to be made more promptly and hence more effectively.
- 5 Deviations from standards can be pinpointed and printed out, accompanied where necessary by detailed analyses.
- 6 Errors in processing can be practically eliminated by controls built into the machines.