A U D I T I N G T H E H P 3 0 0 0 D A T A C E N T E R

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AUDITING THE HP3000 DATA CENTER

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INTRODUCTION

The word "auditor" has unfortunate connotations. The data processing professional facing an internal audit, cannot help but have a vague unconscious vision of the IRS meticulously scrutinizing 1040 forms in a desperate search for illegal deductions.

In fact, the DP auditor is more correctly thought of as an efficiency expert. By analyzing the various aspects of the DP department from an objective viewpoint, the auditor can make recommendations which will benefit both DP operations, and the company as a whole. This more benevolent image of the occupation is very popular with DP auditors, although it is admittedly unlikely to prove much of a comfort to those facing an audit.

The responsibilities of the DP auditor can range from questioning the integrity of an immensely complicated software system to telling someone to get his coffee cup off the line printer. Here it must be understood that the auditor's concerns will vary with the auditor's expertise. While ideal DP auditors are as comfortable with the internal workings of an HP3000 as they are with basic accounting principles, ideal auditors are few and far between. But whatever the extent of technical knowledge, the most important qualification for effective DP auditing is nothing more complex than common sense, a systematic approach and some basis for comparison with other similar data processing environments.

As long as the auditor is not shy and not afraid to ask questions, all of the pertinent information will be available somewhere, regardless of the auditor's technical background.

Various and sundry articles on the auditing function have divided the concerns of the DP auditor into lists ranging from seven to sixty-five relevent topics. There are actually only two: EFFICIENCY AND SECURITY. These two categories do split into quite a few sub-sections, and the purpose of this paper is to provide a list of many of the concerns most often overlooked by the typical HP3000 shop.

In addition, we will focus specifically on the Data Center operations area rather than on such other areas as Systems and Programming.

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STANDARDS AND PROCEDURES

One area where the DP auditor can be particularly helpful is ensuring the existence and enforcement of proper Standards and Procedures. If everyone does things the same way, it's even money they're doing them right.

Standards and procedures in the data processing center should include the following general topics:

Getting the right program in operation at the right time.

Inserting changes into programs at the right time.

Getting the correct data to the right program at the right time.

Protecting the data and programs from accidental or intentional destruction.

Determining that the data processed is complete and accurate.

Methods of physically moving inputs and outputs.

Procedures for controlling data, programs, and the flow of work.

Methods of scheduling work.

Methods of getting work rerun in the event of error or disaster.

Record keeping of work accomplished and resources available to do the work.

Determining that there are sufficient resources available to do the work.

Maintenance and other housekeeping associated with the operation of the computer center.

Do formal standards exist for:

System Development and Maintenance
Program/System Testing
File Conversion

Program/System Change Control
Library Operations
Computer Operations
Documentation

OPERATIONAL WORKFLOW and CONTROLS

Is input data from other departments complete and entered on time?

Does the Data Center keep job accounting information?

Is it evaluated and used by management?

Is anyone notified in case of a production processing error?

Are errors documented?

Are error statistics accumulated or are they ignored?

Are errors followed up so that they will not reoccur?

Is downtime reported and are statistics maintained?

Is there a log of late reports and/or jobs?

Is there a formal communications channel between operations and other departments?

Is there a formal channel for communication of operations "tips" and "gotchas" to all operators?

Are problems that are encountered at the computer documented and is effective action taken to prevent recurrence?

Do operators get feedback on reported problems?

Are headers and $STDLIST information used and checked?

How is it known whether all reports and/or microfiche have been distributed to the to the proper user?

Have procedures been established to control distribution of sensitive output?

Do controls and procedures include the disposal of confidential reports when they are no longer required?

Are operator run instructions maintained up to date?

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SCHEDULING

Efficient production scheduling is extremely important in providing a high level of reliability and predictability to the data processing operation. Ensuring efficient scheduling is an important function of a technical auditor. Here are some points to raise:

Are daily processing activities scheduled?

Is there a daily contingency schedule?

For batch production, are actual run times recorded? Is this data used to calculate expected run times for a given day? Are expected run times compared against actual to ensure that runs have not terminated abnormally?

Are nonscheduled runs supported by a work request or other written authorization?

Are schedule deviations documented and followed up by a supervisor?

Is a firm nightly/batch schedule established and adhered to?

In an online environment, are user-submitted jobs recorded to allow forecasting of future schedules, resource requirements and special processing considerations?

Are ALL jobs submitted through or controlled by operations?

Does operations route all output to the appropriate destination or do users pickup their own output?

Are there standards for the type, quality, and quantity of forms kept on hand?

DATA SECURITY & ACCESS CONTROL

It may come as a surprise, but many successful businesses have information in their data base which should, for reasons unknown, be protected from loss and kept from the competition. Useful questions are as follows:

Are data processing employees instructed as to their responsibilities concerning confidential information?

Does management periodically review and update controls and security provisions relating to data?

Are live production programs physically separated from development programs?

Are all staff prohibited from running test programs against live files?

Are operations personnel denied access to sensitive data files?

Are procedures in effect covering the acceptance and transcription of programs from development into production?

Are program library changes approved and accounted for?

Is acceptance testing of changed programs approved by operations before transcription to production libraries?

Does the approval include assurance that production documentation is also updated?

Are operators prohibited from renaming or transcribing programs without prior supervisory approval?

Are internal labels used for all data and programs files?

Are accounts, users and data files protected by passwords and lockwords?

Are passwords and lockwords changed periodically?

Is an operations log maintained?

Is the area above the suspended ceiling in the computer room accessable only from that area?

Are blank checks and other negotiables:

Issued on run schedule basis only?
Kept in a locked/secure area when unattended?
Controlled by maintenance of access forms?
Periodically inventoried?

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EQUIPMENT UTILIZATION and EFFICIENCY

One unit of measurement for DP efficiency is the U.S. dollar. Others include Swiss francs and German marks, but all of them are essentially monetary. Auditing is a business function, and business measures by money. So, when we say efficiency, we actually mean cost-efficiency. Sad, but true.

Once it has been determined that the entire data processing department is following a perfectly implemented set of standards and procedures to the letter, the auditor's attention can turn to efficient equipment utilization. This can be a particularly tricky area, especially if the auditor is an MBA with no previous computer experience. The key here is simply to ask questions openly about procedures and daily phenomena.

How much machine time is spent on reruns?

Are reruns analyzed? Are certain jobs especially susceptible to reruns?

Are certain programs or jobs inefficient in the area of file design or utilization?

Is the full multiprogramming capability of the HP3000 being utilized for batch production?

Are multiple job streams run concurrently?

Are cpu-bound and I/O-bound jobs mixed to maximize overall throughput?

Are many jobs restartable without rerunning the entire job?

PERSONNEL UTILIZATION and EFFICIENCY

This is a sensitive subject. Wandering around the DP department with a clip-board and jotting notes while the operators discuss the football scores is unlikely to make the auditor many friends. And while management presumably wants to be kept informed, that guy who just sits staring at his terminal could be the Chairman of the Board's nephew. Here are some delicately phrased personnel questions:

Do operations personnel require extensive training and experience in order to be effective in processing daily production work?

Do operators require extensive knowledge of each application they run?

Is there a system to schedule and monitor normal daily processing? Is the system effective? Does it operate without excessive manual involvement?

Do operators spend a large percentage of their time tracking jobs in execution, replying to program messages, changing the fences, etc?

Are operators required to modify jobstreams at run time?

Are all necessary tapes, forms and other resources available when needed or are they found in a panic?

Is there excessive turnover? Why? Is daily production dependent on any specific individual(s)?

Is the operations department treated as the stepchild of the data processing department? After all, the HP3000 doesn't require an operator!

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DISASTER PLANNING and RECOVERY

This is a catch-all category that includes everything from proper insurance planning to keeping terrorists out of the computer room. Here are some questions for your management:

Is there an Emergency Plan that is adequate in relation to the risk?

Is it kept current?

Is it distributed on a "need-to-know" basis only?

Does the Plan include action for offsite storage of files and documentation?

Does the Plan specify:

- The conditions for use of offsite processing?
- Application priority?
- Resource requirements?
- Job scheduling?
- Run documentation?
- Required tapes, forms, supplies, etc.?

Have formal written procedures been instituted for hardware backup?

ENVIRONMENT

Now here is something for the non-technical auditor to sink teeth into. It doesn't take a great deal of scientific expertise to mention that things might run a great deal more smoothly if people didn't have to climb over the disc drives to get to the water cooler. Here are a few suggested Environmental questions:

Is the workspace adequate? Are the facilities neat and orderly? Can all supplies be found quickly, when needed?

Are tape drives cleaned regularly? Are tapes certified regularly?

Are such auxiliary items as bursters and decollators located outside the computer room, but in line with the flow of work for the department?

Are tapes, discs, etc., stored in a closed, fire protected, and limited access area?

ASSISTING THE AUDITOR

The best way to assist a DP auditor, assuming you are so inclined, is to provide as much information as possible. This can be done by studying the lists of suggested questions and answering them in advance.

A more efficient method of providing the auditor with information is to implement a software system which leaves clearly defined audit trails and which issues a wide variety of reports, so that valuable time is not wasted ferreting out information.

In fact, perhaps the first suggestion of each DP audit report should be the installation of a better system to gather the proper data and to make the job easier next time.

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