System Resource Accounting: An Overview of Available Software

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INTRODUCTION

Far too often in the minicomputer environment, the concept of system resource accounting (frequently called "job accounting") is overlooked by upper management. Such machines are cheap in comparison to mainframes, and the incentive to closely monitor usage is marginal.

There inevitably comes a day, however when the cheap little machine must do expensive and important work for too many people, resulting in slower throughput and performance. And that is when upper management confronts the DP manager with the question "Say, who is using up the time? Run us a report that pinpoints the problems."

Most DP managers will have already experimented with some of the resource accounting software available through the Contributed Software Library. Few, however will have a well defined philosophy or methodology of resource accounting that is well supported by the proper software. Usually, upper management will have denied the requests to invest manpower into such an unnecessary system. In the worst cases, accounting needs will have been so overlooked, that when the DP manager rushes to test some of that library software, he will discover that the MPE logging facility hasn't been enabled! Logfiles, notorious for disc space consumption, might also have been quickly purged by the operator.

It is a premise of this paper that accurate and timely information regarding system resource usage is essential for data processing management. The HP3000 Contributed Software Library contains numerous programs and software packages to aid in the collection and evaluation of job accounting data. This paper will examine the available library software, summarizing the strengths and best usages for each. In addition, Whitman College will serve as the example in a case study illustrating the complimentary nature of using in-house developed software with externally acquired programs.

Only software available on Release 07 of the Contributed Software Library, or on the ORLANDO Swap Tape will be discussed. In addition, it should be noted that several organizations and vendors now have general resource accounting software available for sale. One can gain information about such software by reading the advertisements in Interact, or by asking the HP sales representative to check his software reference guide. It is our understanding that HPIUG will be offering such a guide sometime in 1982, as will several private parties. One should also note those software packages, in the Release 07 Guide, with an "F" by the page number of the corresponding index entry. This indicates that the software is available by contacting the vendor appearing in the abstract, although a fee is charged.

The term "system resource accounting" was chosen to title this paper because classic "job accounting" implies keeping records on job or session activities, including such information as start time, stop time, CPU usage, disc I/O counts, etc. This does not encompass the full spectrum of information available on MPE logging records, e.g., powerfail information and console messages. Furthermore, externally developed data such as manually maintained timesheets, although pertinent, is ignored.

The balance of this paper will be split into four sections, with an appendix following. Section I will discuss software that processes "special" MPE log records. Section II will cover the simpler series of programs that yield traditional job accounting information, while Section III will deal with more complex methodologies and software systems. Finally, Section IV is a case study of the approach Whitman College has taken to begin satisfying its system resource accounting needs.

In each of the three sections, the general purpose of the software will be described, its similarities or differences to other software will be discussed, and if appropriate, comments will be made concerning how to run the software. Finally, an asterisk occuring by the software package name indicates that sample results may be found in Appendix A. Before continuing, the reader might take time to review the summary of MPE logfile record types, located in the HP manual.[1] In order to facilitate your evaluation of the results, the same logfile, LOG2345.PUB.SYS, has been used in all software

runs. The following types of logging are enabled on our system:

Type of Logging producing	Record Type No.
Logging Enabled	0, 1
Job Initiation	2
Job Termination	3
Process Termination	4
File Close	5
System Shutdown	6
Power Fail	7
Spooling	8
I/O Error	11

Note that the console logging is disabled. We do not perform statistical analyses on this information and have found a hardcopy console log to be more useful in monitoring this "scene of action".[2]

SECTION I: SOFTWARE FOR "SPECIAL" MPE LOG RECORDS

Software which processes "special" log records, such as powerfails and console messages will be discussed in this section. Special software performing utility functions will also be discussed. Programs falling into this category tend to be standalone (with a few exceptions) and their operation is fairly straightforward. In most cases, it is advisable to examine the source code to ensure that the utility is applicable to your system's configuration. Modifications in such things as equated constants, often those that reflect logfile record size, as well as others, may be necessary to make the software run properly.

CLISTLOG[3]

This program provides a report of all console log records (type 15) in the MPE logfiles . The format of the report is in chronological sequence, using perhaps only 1/3 of the paper consumed in HP's LISTLOG2 report of type 15 records. No statistical analysis on the log records is performed. The utility is similar to JLISTLOG, SLISTLOG and LISTLOG2 in both operation and function. While JLISTLOG and SLISTLOG report on predetermined logfile record types, LISTLOG2 allows the User to specify the type of records desired at run time. All four of the utilities are capable of traversing across a range of logfiles. The User is prompted for the number range of LOG####.PUB.SYS to be searched. The User is also given the option of purging the logfiles after the search. This utility could be quite useful at a site where a hardcopy console log is not used and management wishes to peruse/review this realm of system activity at a later time. The User may direct output by equating the file CLOGLIST to the desired output device. Console logging MUST be enabled for this program to serve its purpose.

CONSLOG[4]

This contribution produces a report of those console log records occurring in MPE logfiles for a given date/time range. The User is not only able to select records by date, but also by defining a character string which must occur in the type 15 records. Output may be directed to a device other than $STDLIST, and the program is capable of building files on disc if a non-existent file is specified for output; input will also be accepted from a command file.

The program prompts the User for a starting date and time to be used as the beginning point of the search, as well as an output file and search string. The program is capable of continuing the search across logfile boundaries, up to the current logfile. The author suggests performing a: SWITCHLOG before running the program, if the User wishes to examine the current logfile (requires OP capability). As mentioned above, the console logging must have been enabled during system configuration to produce the type 15 records the program searches for.

This program would also be useful for installations in which a hardcopy console is not employed, or where management wishes to monitor the appearance of specific users, job/session names, etc. on the system. Because output may be directed to a disc file, the User may develop his own procedures to sort, reformat, or edit the output, according to his needs.

COSTPROG[5]*

This utility calculates the cost of data center services by considering the CPU seconds, connect minutes, and disc sector usage of a group. The report is broken down by account and group across the three elements listed above, and is similar in format to the listing produced by the MPE: REPORT command. The User is able to specify his own cost parameters.

The program does not read MPE logfiles, but instead reads a data file produced by previously issueing the: REPORT command, where output was directed to a disc file. The User is prompted for the cost factors, and can direct output by equating formal file designators to the desired device. The input file equation should be set before running the program.

The User is limited to producing figures only for those accounts he has the capablity to: REPORT on (to: REPORT on all accounts requires SM capability).

JLISTLOG[3]*

Belonging to the family of CLISTLOG and SLISTLOG, this program produces a report of all job initiation and job termination records (types 2 and 3) within a given range of logfiles. The listing is formatted in chronological sequence, and again, consumes approximately 1/3 of the paper consumed by a LISTLOG2 listing of the same records. A page break occurs with each new date.

The User is prompted for the starting and ending logfile numbers; the program looks for them in PUB.SYS. The User is also given the option of purging the logfiles after the search, and will be asked if he wishes to run the program again. Currently accessed logfiles are not available to the program. While LISTLOG2 requires SM capability, JLISTLOG does not.

The contributor recommends that the source code be examined, to ensure that the logfile record size of your installation coincides with that in the source code; modifications should be made before attempting to run the program.

LISTLOG2[6]*

While this utility does not appear on either the library release or swap tapes, it is an HP product universally available to HP3000 users, and seems appropriate for review. This MPE utility produces an ASCII listing of any number of logfile record types across a given range of logfiles. The report is chronologically ordered and record entries are separated by hyphenated break lines.

Operation of the utility is similar to that of the CLISTLOG family. Indeed, this utility is the general version after which the specialized CLISTLOG family is modeled. The User is prompted for which types of logfiles, if not all, he wishes to report. He must also specify the beginning and ending numbers of the logfiles he wants searched, and has the option of purging the specified logfiles after the search. The User is asked if he wishes to run the program again before its termination.

The program is versatile in that output may be directed to any file on any device (e.g., disc or mag tape file as well as line printer). The program is restricted to Users with SM capability.

LOGPURGE[7]

This utility purges a given range of logfiles LOG####.PUB.SYS. The User is prompted for the beginning and ending numbers of the logfile range. The logfile being currently accessed will not be purged.

The program is similar in function to PURGELOG of the DREEACTG software package.

PFAILIST[8]

This program scans logfiles within a given range, and prints the date and time of each logged powerfail. The User is asked to input the starting and ending logfile numbers.

This program could be especially useful to a site in which there is no hardcopy console log to record powerfail messages.

PORTSTAT[8]*

PORTSTAT will scan a given range of logfiles, performing statistical analysis to produce a report on the usage of various ports on the system. Total CPU seconds and connect minutes, as well as the average figure per job/session and standard deviation are broken out against the ldev number. A combined CPU sec/connect minute figure (presumably weighted) is also given. The report heading gives the date/time range of the logfiles scanned. The User is prompted for the logfile number range. The port number range is controlled by equated constants and should be tailored to your site's configuration. Output is to $STDLIST.

READLOG[9]

This utility will carry on a dialogue with the User, scanning a logfile for records selected according to the User criteria input. Logfile records may be sought out by criteria such as such as record type, ldev origination, date, and time range, or in combination. The program will also summarize the number of occurrences of each record type before terminating. By asking for an audit of the logfile, the first and last records will be displayed (handy for finding date/time range of logfile). The User may specify a new logfile to be scanned, without having to reiterate the criteria.

The program opens the logfiles as LOGXXXX.PUB, and therefore should be run in the SYS account. This program could be very useful as a "lead" in monitoring system activity. Only summarizations are performed by the program. While the program does recognize all logfile record types, it does not decode all data items to ASCII format.

SCANUSER[10]

This program produces a report of all activity for which a log record was produced relating to a particular or generic group of Users.

The program issues a prompt for the User name in question (or generic user.acct) , and then for a logfile number. The program is capable of handling up to 15 concurrent users, and is most informative when most logging functions are enabled.

SLISTLOG[3]*

This program is another member of the CLISTLOG family, its function being to seek out spool file close log records (type 8) within a given range of logfiles. The report produced is in chronological sequence, and formatted with uniform column headings which break out each type of data element occuring in the log record. A page break occurs upon each new date encountered.

The User is prompted for a logfile range to be searched, and is given the options of purging the logfiles, and/or running the program again.

SECTION II: "SIMPLE" SOFTWARE FOR JOB ACCOUNTING

This section will discuss the "simpler" software that can be used to derive job accounting information. The

software in this area is generally easy to use, and requires the least amount of preparation. Relatively little statistical analysis or summarization is performed on the data, and results tend to be of a highly detailed nature.

LOGDB[11]

Briefly summarizing, this software system is designed to read system logfiles, loading them into an IMAGE database. The structure of the database is one that allows for simple report generation via QUERY or application programs. Some summarizations are performed upon the data. It is loaded in nearly "raw" form to the database, with the conversion of some data elements to ASCII format. The system is also capable of "rationalization" which eliminates a good deal of redundant data.

The system, as it is available on the Orlando swap tape, includes "first time" jobstreams, intended to compile all source code and initially create the database. Daily procedures are also incorporated into several job streams which jointly serve to read the logfiles, load the database, and produce reports while performing any "housekeeping" necessary to accomplish this. The reports provided are generated by QUERY through the execution of several command files. While highly detailed in nature, the reports may serve well as skeletons by which a site can tailor its own reports.

In a little greater detail, the general structure of the database is as follows: Paths are defined by several automasters, however one manual
"job-head" master exists which holds information needed for several of the detail sets. There is a detail data set for each type of log record encountered in system logfiles, with these exceptions:

1. Console log records are written to a console log.
2. Job initiation and job termination records (types 2 and 3) are combined into one detail set. This is the JOB-INIT/TERM data set which also houses several count fields. The set has been designed to facilitate billing from one set.

The detail data sets are loaded on a one entry per log record basis, except for the JOB-INIT/TERM set mentioned above, which houses some summary fields, and the LOGICAL-MOUNT set which contains only one entry for each job or session, and holds a total field. Entries are also not created for certain types of file closes, although they might be added to I/O count fields.

No duplicate job/session numbers are allowed on the database, thus if the loading program encounters duplicate numbers within a group of logfiles, it assumes the most recently encountered as the current job/session. This problem can, for the most part, be avoided by processing logfiles on a daily basis rather than in large groups. The data set capacities are currently set to acommodate approximately four logfiles. This may be altered to your site's needs. Overall, the input to the system consists of log files. Output consists of a loaded database, a hardcopy console log (assuming console logging has been enabled), and an error listing to $STDLIST. An in flight processing summary report may also be output to a terminal by using a control-y interrupt; the last logfile to be processed, and the logfile being currently processed are displayed. The system also creates a few working files which ensure continuous processing of logfiles between daily runs.

SECTION III: "COMPLEX" SOFTWARE FOR JOB ACCOUNTING

The use of software appearing in this section is perhaps not as straightforward as that in the preceding section. Proper use of the software to yield meaningful results requires that a an accompanying methodology be developed and followed on a regular basis. These packages are capable of performing a greater amount of statistical analysis on the data accumulated, producing reports of a higher summary level. The packages generally also provide opportunities to produce highly detailed reports, depending at which phase of the process one finds oneself.

DREEACTG[12]*

This software system actually tracks system utilization in two manners, the first via the processing of MPE logfiles, producing job/session information, and the second recording disc storage utilization using data created by the: REPORT command. The two systems are independent, however they both consist of a series of daily procedures which accumulate information, with another series of periodic (monthly) procedures designed to summarize and present the data in various formats. The modular structure of the system allows a site to use the software in its entirety, or to utilize those portions of the package applicable.

The system is capable of a large amount of statistical analysis, producing highly detailed reports which accompany the daily data accumulation, as well as periodic summary reports which break out the data in several manners. The reports could be highly useful to an operations staff in monitoring system resources, to account managers and/or project leaders by informing them of system activity associated with their "domain," as well as to DP management in holding various cost centers accountable for system usage.

While the method of cost center assignment is specifically geared toward the account structure found at the contributor's site, this logic module is a self contained subroutine which could easily be altered to a site wishing to apply its own philosophy of cost center assignment.

Cost computations are performed using weighting factors held in an initialization subroutine, as well as a cost limiting factor; these factors can also be easily reviewed and modified by a site wishing to weight or limit computations in a different manner.

In a slightly more detailed consideration of the job/session processing portion of the package we see that the daily procedures involve two steps. The first is performed by the program ACUMLOG, which functions to summarize by job/session all activity accounted for in the MPE logfile under that job/session number. Summary files produced in the first step are then read by the program LOGRPT, which appends cost fields to the activies, producing a monthly summary file in the second step. It might be useful to note that only log record types 2,3,4,5,8 and 9 are considered. Only summary records for job/session numbers less than 1000 are processed by LOGRPT; this can also be altered for sites whose job/session numbers commonly surpass this limit. It might also be worthy to note that one must take care to manually ensure that summary files for different months are kept separate.

Reports produced include logfile summary reports, job/session detail reports and monthly reports, produced from the monthly summary files, are broken out by account and at the group level, and cost center level. Invoices may also be produced, broken out primarily by cost center, and at a secondary level by the account structure within.

The disc storage utilization portion of the package generates reports in a manner similar to those mentioned above. Data is obtained from directing the output of a: REPORT command to a disc file. The data thus obtained is then accumulated on a daily basis by the program ACUMDISC which creates a monthly master file after cost fields have been appended. The disc charge rate is hard coded into the program and can be easily changed.

Extended documentation of the system can be obtained. This outlines detailed operating procedures, most of which are incorporated into jobstreams.

This package is an example of the incorporation of another library contribution, ACUMLOG[7] into an in-house tailored job accounting system.

LOGUTIL[13]*

This user oriented and highly versatile software package is designed to serve four general functions. It facilitates the storage of logfiles in a randomly accessible format, it scans logfiles, selecting and displaying log record types chosen by the User, it summarizes various types of activity logged within the file, and it analyzes such summaries in terms of job/session activity, file activity, or device I/O errors. The program is versatile in its ability to accept input and output both to and from disc or tape, or in combination. This is controlled through file equations. Various report options are given the User within each generic type of report. Options include such items as detail level, sort-item, and rank item within sort item.

The package consists of the three programs LOGUTIL, LOGREPT and FILERPT; a data file is also required which reflects your site's configuration. LOGUTIL is the central program of the system, performing the storage, summary, and scanning functions, as well as the evaluation of I/O errors. The other two programs, LOGREPT and FILERPT, analyze the summary files produced by LOGUTIL, to produce the various job/session and file activity reports.

Briefly, the program LOGUTIL allows for the selection of three functions. Logfiles may be copied to tape in a consolidated fashion (multiple reels are supported), an audit review of the logfiles performed, or an I/O error analysis reported. Output depends upon the option selected and may include a "loaded" tape, a listing of the number of records in each logfile, starting and stop time, a listing or file of summaries for each job/session, summaries file, a file activity summary file, and a summary listing showing the number of occurances of each record type in the logfile. Logfiles may be optionally purged, if the User has SM capability.

The program LOGREPT analyzes the job/session summary file produced by LOGUTIL. The User is prompted for such selections as the listing device, the input file name, the report date range, whether to analyze by groups or users, any groups or users to be excluded from analysis, and the detail level of the report (long or short); the program can also provide account summaries.

The program FILERPT carries on a healthy dialogue with the User, in a triple nested loop fashion. The file activity report produced may be "viewed" by files accessed, by name or rank of access, and by User accessing the files. Likewise, the report may be presented primarily by Users accessing files, by name or rank of access, and with or without the files accessed being listed. There are several sort items from which the User may choose to "rank" output. Counts and totals are also given.

The contributor recommends that the source code of LOGUTIL and LOGREPT be examined and modified to handle your system's configuration.

The operation of the system is quite well documented.

SECTION IV:
A CASE STUDY OF WHITMAN'S SYSTEM RESOURCE ACCOUNTING

Since its beginning in mid-1977, the Computer Services organization has kept records of work performed for the various offices on campus. These records included some computer-generated information on machine and paper usage, as well as manually maintained records on human resource usage.

Frankly, upper management cared little about such records. Most resources were adequate, and User concerns centered around when they would "get their turn."The Computer Services Office used available software to occasionally monitor the system usage, and

correctly predicted the inevitable shortfall of computer resources. The software mentioned above included a rudimentary Manpower Accounting System, dating to mid-1978, created using student labor. This had been planned as one part of a larger Job Accounting system, however manpower was never made available to complete the task. Thus, the Center relied upon such packages as DREE to monitor actual computer usage. While these packages were more than adequate to get a measure of system activity, they did little to provide comprehensive evaluations of the overall impact of various User offices.

The onset of lack of resources forced a change in most everyone's thinking. In pursuing the creation of a five-year plan for computer usage on campus, the Computer Policy Committee recognized the need for usable, consistent data for planning. While the aforementioned Manpower Accounting reports were of help, most of the computer-generated information was simply not in a "digestible" form. This resulted in some justifiable criticism of the material presented in support of the proposed five-year plan. The supporting figures were primarily directed toward manpower usage, with only highly technical information available on machine utilization. The support and maintenance functions were not delineated from development functions, and at times, were aggregated with both the User and the Computer Center itself. No actual dollar figures tied back to real expenditures were presented. In general, the User was left with an incomplete picture of the amount and type of activity on the computer.

Development of a "diary" database, and supporting programs then ensued. The resulting system resource accounting system, called the DIARY, was designed to fulfill information needs in three areas. It accounts for manpower resources, computer resources, and material resources, such as paper. The three areas taken into account are made unique from each other in the level and type of data collected, as well as the collection methods used. The areas also have several common features, namely the resulting derived data and the philosophical approach used in deriving summary level data. Unique requirements are addressed by logic modules designed to meet those needs. The common requirements are fulfilled by the conversion of usage figures into standardized units, useful in analysis.

It would perhaps be best to briefly summarize the philosophy of the DIARY, and then proceed with a more detailed description of the software and methods used in its support.

We wished to present system resource accounting information in a manner which would correlate not only the types of resources being used with the application system receiving the benefits of such usage; it was necessary to indicate whether the resources were invested in production work within a system, maintenance of the system, or development of an entirely new system. Furthermore, the activities of the Computer Center staff needed to be represented in a way which delineated between the general overhead needed to maintain the organization, and services rendered accountable to specific offices. It was also necessary to separate usage figures generated by administrative functions from those generated by academic functions. While many shops might be able to keep accurate figures by strictly designating logon accounts to be used for specific purposes, we wished to gather more detailed data, in terms of computer resources. While Whitman College does not employ actual charge-back, the structure of the database preserves this as a viable alternative for the future.

The three logic modules of the DIARY are named by the type of information which they address. They are the Unit of Manpower (UOM), the Unit of Processing (UOP), and the Unit of Resources (UOR) modules. While the UOM is daily in orientation, the UOP and UOR modules summarize data by the month. The unique features of each module will be discussed after examining the set of common "unifying" codes which are derived from the various types of data encountered in each module. The authors acknowledge the fact that while the following codes presented are applicable to the specific information needs of Whitman College, they may not be entirely appropriate for shops in a different environment. It would be helpful in the discussion that follows, to examine the examples, in Appendix B, of how these codes are employed in our shop.

- Activity Area — denotes a general type of activity, (Production, Maintenance, Primary or Secondary Development. Primary development involves the creation of a new system; secondary development involves the addition of new programs or functions to an existing system.)
- Sector — makes a general distinction between administrative, academic and computer center functions
- Office — Designates a particular administrative office, or academic division. (Registrar, Admissions, Division of Social Sciences, etc.)
- System — an application system in which work is being performed. Each system is "assigned" to an office which is held accountable for the system. (Payroll, General Ledger, Class Grading, etc.) Each academic department also is assigned its own system code (Physics)
- Project (SR) — Project numbers are assigned to any production or maintenance work which is performed in response to a service request, and is performed by a computer center staff member. A project may affect several User systems, and the format of the number allows evaluation on either a project or system orientation.

The office code is functionally analogous to the cost center. Due to the heirarchical structure of the codes, those at the top may be derived simply by "climbing the

ladder." While this may appear redundant, the design of the system was partially dictated by the ad hoc inquiry tools available, such as QUERY[14] and QUIZ[15]. Efforts could then be concentrated upon creating systems to load the database, rather than in creating report programs.

Separate tables drive the software that tags and identifies the aforementioned codes to each job accounting record. Some of these tables require a minimal amount of manual maintenance. Such maintenance might be due to the creation of a new account, or to the installation of a new system. While the assignment of codes and cost centers may be completely by defaults, the tables allow for proper assignment of codes in exceptional cases.

The UOM records the actual hours worked within the computer shop by all staff. The UOM is the straight-time dollar/hour rate of an employee, multiplied by the hours reported. Whether the employee is of exempt or non-exempt status is ignored, resulting in a "weighted" charge for services depending upon the person providing it. All hours are designated to a system code, and an activity code; the activity code is more specific than the activity area, however can be mapped to the activity area after considering the system/activity code combination. A project number might also be optionally recorded, provided it is compatible with the activity code (e.g., a maintenance project code would not be compatible with a system undergoing primary development). Data in this module is handled in a fairly specific manner. Accountablilty goes even to the program number being worked on, where the program number takes the place of an activity code. Reports can be generated by employee, by system, by activity, and by project. Such detailed reports may not be of great interest to upper management, but are useful to staff members in visualizing where their efforts are spent. It is important to emphasize that unless staff members reports all hours worked, regardless of whether or not they are paid, the accuracy of the UOM module as a planning tool is considerably degraded.

The Unit of Processing module provides comprehensive information relating to machine utilization. The UOP is a derived figure making use of weighting factors built into the accounting processor obtained from the Department of Regional Economic Expansion (DREE). A portion of the DREE software is used in the first step towards loading the UOP leg of the DIARY. The DREE package is used to summarize raw data from the log-files, by session and by job, and to append cost fields to the activities represented. Because our philosophy in assigning cost centers is different from that of DREE, in-house developed software then performs the remaining steps in loading the database. The following paragraph briefly describes our method of assigning cost centers.

While DREE incorporates the cost center code into the User name, we have found that cost centers are not so "cut and dried" in our shop. It is relatively safe to assume that any work performed in an administrative User's account is production work, as well work performed in student or faculty accounts as being academic. However, accountability as to the software system being used is lost. The major problem is in tracking the type of work being performed by Computer Center staff members, which may be development, maintenance, or in support of User production. We have resorted to extensive use of standardized job/session names which vary according to the type of work the staff member intends to perform when logging on. The combination of job/session name, user name, and logon account is checked against the code assigning tables mentioned previously. From the tables, the cost center is derived. The structure of the job/session name is either of the form of a specific project number, or of the format "system code/general activity area." Thus we are able to account for work performed on the computer down to the system level; the type of work is inherent in the project number, or in the activity area, whichever is used. The UOM module also accounts for activity under project number, and activity codes are mapped to general activity areas, as mentioned before.

Using ad hoc inquiry methods, reports can be generated that delineate between production, development, or maintenance work; The amount of each type of work taking place within application systems can also be reported. And most certainly, reports may present in both text and graphical forms the comparative usage of processing power, as well as staff manpower, by administrators, faculty, and students.

The Unit of Resource (UOR) module provides data relating to paper usage. The UOR is a derived figure, relating to the print-line count obtained from MPE log-files, and summed by DREE software employed.

The DIARY database is diagrammed in Appendix B - I.1. Software should be run on a regular basis to summarize and transfer data between the sets. The emphasis is upon running timely detail reports, and then eliminating any accumulation that is unnecessary.

Unless Users know how much it costs to provide them services, it will be difficult to prioritize or separate actual needs from "wish lists." Cost values are maintained for UOM, UOR and UOP, although they are approximate until the close of the fiscal year. Such data relating actual expenses to Computer Center activities is a necessary planning tool for Users, and is helpful only if made available on a timely basis.

The investment in software for all of this is actually very modest. The "lions share" is for the load programs, and those that handle summarization. Of course, reports of greater precision will ultimately be developed. Because the system was targeted for ad hoc reporting, the software investment shall continue to be minor. The following is a summary of current programs

and their functions in the flow of information within the DIARY:

JA120 — UOM Staff Activity Report Input Screen

JA202 — Summarizes UOM-DTL, loading ACTIVITY-DTL

JA204 — Summarizes UOM-DTL and UOP-DTL, loading the SUMMARY-DTL

JA234 — Transfers DREE records to UOP-DTL, adding record heads

JA323 — UOM Monthly Manpower Report by Employee

JA325 — UOM Monthly Manpower Report by System

JA327 — UOM Monthly Manpower Report by Activity

JA329 — UOM Monthly Summary of Employee Hours

JA405 — UOP Monthly Summary of Machine Utilization by Sector

JA640 — SUMMARY-DTL Report of UOM, UOP, and UOR against activity area, within system, within office

In addition:

The PROJECT-MST, EMPLOYEE-MST, and BUDGET-DTL are manually maintained via DBENTRY[16].

CONCLUDING REMARKS

The classic concept of "job accounting" is inadequate to provide management with a proper understanding of the cost involved in providing total service to Users. Only total "system resource accounting," which includes manpower, equipment, and material resources can hope to provide the divergent types of data needed.

While few shops will find free or fee-charged software that adequately meets their needs, there is a wide variety available to begin with. Much of this is free to members of the Users Group. It is important that shop management recognize the need to gather such data, before confrontations with upper management prompt the need. Certainly, each shop will need to tailor any general purpose accounting software system to their own environment. Better to start early, for a large base of historical data is usually required to establish trends.

All of the above reinforces the need to plan early. The authors of this paper hope that the material and considerations presented will help you formulate the appropriate course of action for your shop.

REFERENCES

[1]Detailed information on logfiles may be found in the HP System Manager/System Supervisor Manual, Section VI.

[2]See "The Hardcopy Console: A Tool for Installation Management," by W.E. Holt, Montreux Proceedings, 1980.

[3]Contributed by Linford Hackman, Vydec, Incorporated. [4]Contributed by S.G. Joerger, Armament Systems Incorporated.

[5]Contributed by Bill Klages, DE Systems, Incorporated.

[6]An HP product; see the MPE System Utilities manual, Sect. IV, for operating instructions.

[7]An anonymous contribution.

[8]Contributed by Jon Falconer, Pacific Union College.

[9]Contributed by John A. Maus, Hewlett-Packard.

[10]On Orlando Swap tape, Bob Dunn programmer.

[11]Contributed by The Bose Corporation.

[12]Contributed by Serge Bazinet, Department of Regional Economic Expansion, Govt. of Canada.

[13]Original author was Gerry Wade, contributed by Brent J. Thompson, The Development Office, BYU, with some modifications.

[14]An HP product for on-line inquiry. See IMAGE and QUERY manuals.

[15]Produced by Quasar Systems Ltd.

[16]An IMAGE-VIEW interface program, contributed by Bruce Kau, Tours, Incorporated.

APPENDIX A

Table of Contents

```
:BUILD RRR;REC=-72,,,ASCII;DEV=DISC;DISC=1000
:FILE RRR,OLD;DEV=DISC
:REPORT @,LIB,*RRR
:FILE FTN01=RRR,OLD
:FILE FTN07;DEV=COMLP
:RUN COSTPROG;STACK=2000

ENTER COST PER CPU SEC IN DOLLARS ?0.001

ENTER COST PER CONNECT MINUTE IN DOLLARS ?0.01

ENTER COST PER SECTOR IN DOLLARS ?1.00

END OF PROGRAM
:FILE OUTFILE;DEV=COMLP
:RUN PSCREEN.UTIL.IRIS
LOCKWORD: PSCREEN,UTIL,IRIS?

**SCREEN CONTENTS @: WED, JAN  6, 1982,  11:08 AM
```

ACCOUNT	FILESPACE-SECTORS		CPU-SECONDS		CONNECT-MINUTES		DOLLAR
/GROUP	COUNT	LIMIT	COUNT	LIMIT	COUNT	LIMIT	CHARGES
LIB	16888	**	2555	**	2645	**	$15,917.00
/DATA	589	**	24	**	18	**	$589.20
/DOC	783	**	77	**	191	**	$784.99
/JOB	132	**	0	**	0	**	$132.00
/PUB	10244	**	2185	**	2374	**	$10,269.93
/SOURCE	5140	**	269	**	62	**	$5,140.89

```
   TIME      JOB#   ON/OFF      JLISTLOG A.00.00    DATE: FRI, DEC  4, 1981,  1:33 PM       LOGFILE: 2345

13:33:50:3  #J690     ON     FDDEV,NYHAGEN,WCCS,N1; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
13:40:00:2  #J691     ON     UFUPDTCA,BUSENTRY,ADMIN,BUSINESS; PRI=DS; CPU=5000; INPRI=8; OUTPRI=8; JIN=10; JLIST=17
13:41:00:9  #S2893    OFF                          CPU-SEC=43; ELAPSED-MIN=43; MAXPRI=0; NUM-CREATIONS=15
13:41:56:5  #J691     OFF                          CPU-SEC=7; ELAPSED-MIN=2; MAXPRI=0; NUM-CREATIONS=3
13:42:51:9  #S2952    OFF                          CPU-SEC=33; ELAPSED-MIN=23; MAXPRI=0; NUM-CREATIONS=8
13:43:11:5  #S3098    ON     SANDERCR,STU84B,SANDERCR; PRI=CS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=53; JLIST=53
13:43:36:9  #S2683    OFF                          CPU-SEC=140; ELAPSED-MIN=90; MAXPRI=0; NUM-CREATIONS=48
13:43:55:5  #S3100    ON     LUTTGEJC,STU85B,LUTTGEJC; PRI=CS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=47; JLIST=47
13:44:10:8  #J692     ON     UFUPDTCA,BUSENTRY,ADMIN,BUSINESS; PRI=DS; CPU=5000; INPRI=8; OUTPRI=8; JIN=10; JLIST=17
13:45:08:2  #J690     OFF                          CPU-SEC=62; ELAPSED-MIN=12; MAXPRI=0; NUM-CREATIONS=4
13:45:10:1  #S2694    OFF                          CPU-SEC=18; ELAPSED-MIN=47; MAXPRI=0; NUM-CREATIONS=1
13:45:13:4  #J693     ON     FDDEV,KELSEY,WCCS,K1; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
13:45:35:1  #J692     OFF                          CPU-SEC=8; ELAPSED-MIN=2; MAXPRI=0; NUM-CREATIONS=3
13:45:39:3  #J694     ON     GL1AJOB,BATCH,ADMIN,BUSINESS; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=17
13:47:25:6  #S3102    ON     MICHELSO,ADMIN,ALUMNI; PRI=CS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=57; JLIST=57
13:47:38:4  #J694     OFF                          CPU-SEC=15; ELAPSED-MIN=2; MAXPRI=0; NUM-CREATIONS=7
13:49:26:2  #J695     ON     GL1AJOB,BATCH,ADMIN,BUSINESS; PRI=DS; CPU=UNLIM; INPRI=4; OUTPRI=0; JIN=10; JLIST=17
13:49:57:7  #S3108    ON     FDDEV,NYHAGEN,WCCS,NYHAGEN; PRI=CS; CPU=UNLIM;HIPRI; OUTPRI=0; JIN=27; JLIST=27
13:51:55:7  #S2877    OFF                          CPU-SEC=4; ELAPSED-MIN=123; MAXPRI=0; NUM-CREATIONS=1
13:52:09:4  #S3108    OFF                          CPU-SEC=4; ELAPSED-MIN=3; MAXPRI=0; NUM-CREATIONS=1
13:57:14:1  #S3113    ON     FDDEV,NYHAGEN,WCCS,N1; PRI=CS; CPU=UNLIM;HIPRI; OUTPRI=0; JIN=27; JLIST=27
13:52:41:9  #J695     OFF                          CPU-SEC=14; ELAPSED-MIN=4; MAXPRI=0; NUM-CREATIONS=7
13:52:45:4  #J696     ON     FDDEV,MANAGER,WCCS,COMMON; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
13:54:58:2  #J696     OFF                          CPU-SEC=14; ELAPSED-MIN=3; MAXPRI=0; NUM-CREATIONS=1
13:55:09:2  #J697     ON     FDDEV,MANAGER,FINDEV,PUB; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
13:56:13:9  #J697     OFF                          CPU-SEC=5; ELAPSED-MIN=2; MAXPRI=0; NUM-CREATIONS=1
13:57:13:2  #S3113    OFF                          CPU-SEC=5; ELAPSED-MIN=6; MAXPRI=0; NUM-CREATIONS=1
13:57:19:7  #J698     ON     GL1AJOB,BATCH,ADMIN,BUSINESS; PRI=DS; CPU=UNLIM; INPRI=4; OUTPRI=0; JIN=10; JLIST=17
13:57:32:2  #S3124    ON     COTTREFM,STU84B,COTTREFM; PRI=CS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=44; JLIST=44
13:59:02:9  #S3126    ON     FDDEV,NYHAGEN,WCCS,N1; PRI=CS; CPU=UNLIM;HIPRI; OUTPRI=0; JIN=27; JLIST=27
14:01:22:5  #J698     OFF                          CPU-SEC=13; ELAPSED-MIN=5; MAXPRI=0; NUM-CREATIONS=7
14:01:27:6  #J699     ON     UFUPDTCA,BUSENTRY,ADMIN,BUSINESS; PRI=DS; CPU=5000; INPRI=8; OUTPRI=8; JIN=10; JLIST=17
14:02:50:7  #S3124    OFF                          CPU-SEC=11; ELAPSED-MIN=6; MAXPRI=0; NUM-CREATIONS=4
14:03:00:9  #J699     OFF                          CPU-SEC=7; ELAPSED-MIN=2; MAXPRI=0; NUM-CREATIONS=3
14:03:14:0  #J700     ON     GL1AJOB,BATCH,ADMIN,BUSINESS; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=17
14:03:57:5  #J693     OFF                          CPU-SEC=125; ELAPSED-MIN=19; MAXPRI=0; NUM-CREATIONS=4
14:04:23:0  #S3126    OFF                          CPU-SEC=4; ELAPSED-MIN=6; MAXPRI=0; NUM-CREATIONS=1
14:04:34:2  #S3132    ON     FDDEV,MANAGER,WCCS,BATCH; PRI=CS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=27; JLIST=27
14:05:51:6  #J701     ON     UFDSJENT,BUSENTRY,ADMIN,BUSINESS; PRI=DS; CPU=5000; INPRI=8; OUTPRI=8; JIN=10; JLIST=17
14:06:59:1  #J700     OFF                          CPU-SEC=25; ELAPSED-MIN=4; MAXPRI=0; NUM-CREATIONS=7
14:08:14:2  #J702     ON     FDDEV,MANAGER,FINDEV,PUB; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
14:09:11:1  #J701     OFF                          CPU-SEC=19; ELAPSED-MIN=4; MAXPRI=0; NUM-CREATIONS=5
14:09:21:4  #J702     OFF                          CPU-SEC=5; ELAPSED-MIN=2; MAXPRI=0; NUM-CREATIONS=1
14:09:41:6  #J703     ON     FDDEV,KELSEY,WCCS,K1; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
14:09:42:2  #J704     ON     FL1JOB,BATCH,ADMIN,BUSINESS; PRI=DS; CPU=UNLIM; INPRI=6; OUTPRI=0; JIN=10; JLIST=17
14:10:15:5  #S2896    OFF                          CPU-SEC=48; ELAPSED-MIN=71; MAXPRI=0; NUM-CREATIONS=23
14:10:31:3  #S3147    ON     HANFORET,STU82,HANFORET; PRI=CS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=44; JLIST=44
14:11:33:5  #S3151    ON     OHPROD,MANAGER,ADMIN,COMMON; PRI=CS; CPU=UNLIM;HIPRI; OUTPRI=0; JIN=45; JLIST=45
14:12:30:6  #J704     OFF                          CPU-SEC=9; ELAPSED-MIN=3; MAXPRI=0; NUM-CREATIONS=4
14:13:14:2  #J703     OFF                          CPU-SEC=15; ELAPSED-MIN=4; MAXPRI=0; NUM-CREATIONS=3
14:13:33:4  #J705     ON     FDDEV,MANAGER,FINDEV,PUB; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
14:14:24:3  #J706     ON     ARPROD,KELSEY,WCCS,K1; PRI=DS; CPU=UNLIM; INPRI=8; OUTPRI=0; JIN=10; JLIST=23
14:15:27:0  #S2956    OFF                          CPU-SEC=82; ELAPSED-MIN=56; MAXPRI=0; NUM-CREATIONS=10
14:15:58:3  #J705     OFF                          CPU-SEC=10; ELAPSED-MIN=3; MAXPRI=0; NUM-CREATIONS=1
14:16:13:4  #J707     ON     FL2JOB,BATCH,ADMIN,BUSINESS; PRI=DS; CPU=UNLIM; INPRI=6; OUTPRI=0; JIN=10; JLIST=17
```

```
   TIME     TYPE  JOB#       C00,00             DATE: FRI, DEC,  4,1981     LOGFILE: 2345

                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :51:2  FILE  J 684     $STDLIST.BATCH   .ADMIN      0     1    1280          32 /0     26           0
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                        PROG SEG * SL SEG * MAX STACK * MAX DS * VIRT ST *
  12:5 :51:4  PROC  J 684       0        0         2772       14        147
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :51:6  FILE  J 684     QUISPUDC.PUB     .IRIS       0     1    2             0  /11    3            1
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :51:7  FILE  J 684     SYSUDC   .PUB    .SYS        0     1    35            0  /13    93           6
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :52:1  FILE  J 684     AD310S13.BATCH   .ADMIN      4     2    1604          0  /11    0            0
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                        MAX PRI * CREAT * CPU TIME(S) * ELAPSED (M) *
  12:5 :52:5   OFF  J 684       0       2       175          9
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :53:5  FILE  J 684     $STDLIST.BATCH   .ADMIN      0     0    36            32 /0     33           2
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :53:7  FILE  J 684     $STDIN   .BEACON .IRIS       4     1    8             24 /0     14           1
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :55:9  FILE  S 2879    $NEWPASS.WEISSHC .STU85B     0     0    201           0  /13    21           21
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :56:2  FILE  S 2879    FTNIC    .WEISSHC .STU85B    4     0    256           0  /13    12           12
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :56:3  FILE  S 2879    FTNUT1   .WEISSHC .STU85B    4     0    9             0  /13    6            6
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :56:4  FILE  S 2879    PROJ1    .WEISSHC .STU85B    0     1    33            0  /13    95           32
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :56:4  FILE  S 2879    FTNLIST  .        .          1     0    0             16 /61    201          201
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                        PROG SEG * SL SEG * MAX STACK * MAX DS * VIRT ST *
  12:5 :56:4  PROC  S 2879      22       5         6832       8         276
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :56:5  FILE  S 2879    $STDIN   .        .          0     0    0             16 /61    201          201
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :56:5  FILE  S 2879    $STDLIST.         .          0     0    0             16 /61    201          201
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :57:5  FILE  S 2879    SEGPROC  .PUB     .SYS       0     1    144           0  /1     9            9
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                 FILE NAME            * DISP * DOM *  SECTORS   * DEV T/# *  RECORDS  *   BLOCKS   *
  12:5 :59:5  FILE  S 2879    $NEWPASS.WEISSHC .STU85B     0     0    15            0  /2     28           28
                       * - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

FROM: FRI, DEC 4, 1981 12:05 PM TO FRI, DEC 4, 1981 2:57 PM

LDEV	JOB COUNT	JOB CPU SEC./CONNECT MIN.			JOB CPU SECONDS			JOB CONNECT MINUTES		
	TOTAL	TOTAL	JOB AVE	STD.DEV.	TOTAL	AVERAGE	STD.DEV.	TOTAL	AVERAGE	STD.DEV.
20	0									
21	0									
22	0									
23	0									
24	0									
25	0									
26	1	.83	.83	.00	5	5.00	.00	6	6.00	.00
27	8	1.61	1.54	1.06	106	13.25	12.82	66	8.25	6.78
28	0									
29	0									
30	0									
31	0									
32	0									
33	0									
34	0									
35	0									
36	0									
37	0									
38	0									
39	0									
40	0									
41	1	1.19	1.19	.00	121	121.00	.00	102	102.00	.00
42	0									
43	1	.75	.75	.00	60	60.00	.00	80	80.00	.00
44	5	.60	.96	.62	47	9.40	4.88	78	15.60	15.83

SLISTLOG A.00.00 DATE: FRI, DEC 4, 1981, 12:06 PM LOGFILE: 2345

TIME	JOB#	DFID	FILENAME	JSNAME, USER . ACCOUNT	ORIG-J#	NUM-I/O	#SECT	COP	PRI	SP#	D-T	C-C	DIS
12:06:19:7	#S2879	#06296	FTN82	WEISSHC,STU85B		51	40	0	8	18	32	OK	0
12:07:46:1	#S2846	#06249	QUADLIST	WINTERJ,FAC		5445	884	0	8	6	32	OK	0
12:08:05:5	#S2864	#06250	FTN50	RIORUD,WHITMAN		278	136	0	8	6	32	OK	0
12:09:07:9	#J677	#06251	$STDLIST	CR212JOB,BATCH,ADMIN		39	32	0	8	6	32	OK	0
12:08:11:6	#S2866	#06259	Y1	OHPROD,MANAGER,STU85B		45	44	0	8	6	32	OK	0
12:08:16:9	#S2867	#06261	Y1	OHPROD,MANAGER,STU85		87	56	0	8	6	32	OK	0
12:08:21:8	#S2868	#06263	Y1	OHPROD,MANAGER,STU84		78	52	0	8	6	32	OK	0
12:08:25:0	#S2869	#06265	Y1	OHPROD,MANAGER,STU84B		45	44	0	8	6	32	OK	0
12:08:30:2	#S2870	#06267	Y1	OHPROD,MANAGER,STU83		84	56	0	8	6	32	OK	0
12:08:31:5	#J680	#06268	$STDLIST	FBTRL,RICHMOSL,STAFF		15	32	0	8	6	32	OK	0
12:08:36:0	#S2871	#06271	Y1	OHPROD,MANAGER,STU82		70	52	0	8	6	32	OK	0
12:08:44:0	#J670	#06214	$STDLIST	FDDEV,MANAGER,FINDEV		136	48	0	8	6	32	OK	0
12:08:45:4	#S2873	#06276	Y1	OHPROD,MANAGER,STU82B		11	32	0	8	6	32	OK	0
12:08:47:7	#J681	#06270	$STDLIST	CR210JOB,BATCH,ADMIN		39	32	0	8	6	32	OK	0
12:08:55:4	#J684	#06291	F422WIDE	AD310JOB,BATCH,ADMIN		123	68	0	8	6	32	OK	0
12:08:57:6	#J684	#06290	$STDLIST	AD310JOB,BATCH,ADMIN		35	36	0	8	6	32	OK	0
12:12:04:2	#J683	#06289	$STDLIST	FDDEV,KELSEY,WCCS		3190	916	0	8	6	32	OK	0
12:17:10:7	#S2862	#06299	EDTLIST	PETSOLL,STU84		182	60	0	8	18	32	OK	0
12:24:26:2	#S2882	#06303	FTN82	WEISSHC,STU85B		51	40	0	8	18	32	OK	0
12:26:42:3	#S2882	#06304	EDTLIST	WEISSHC,STU85B		133	52	0	8	18	32	OK	0
12:42:24:1	#S2846	#06306	LP	WINTERJ,FAC		134	40	0	8	18	32	OK	0
12:48:51:7	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		14	456	7	12	6	32	OK	1
12:49:59:0	#S2862	#06310		PETSOLL,STU84		7	32	0	8	18	32	OK	0
12:50:16:9	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	7	12	6	32	OK	0
12:51:31:1	#S2862	#06312	EDTLIST	PETSOLL,STU84		195	64	0	8	18	32	OK	0
12:51:35:5	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	6	12	6	32	OK	0
12:52:51:6	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	5	12	6	32	OK	0
12:53:45:8	#S2885	#06313	FTN99	HANFORET,STU82		37	36	0	8	18	32	OK	0
12:54:08:0	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	4	12	6	32	OK	0
12:55:23:7	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	3	12	6	32	OK	0
12:56:39:3	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	2	12	6	32	OK	0
12:57:57:5	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	1	12	6	32	OK	0
12:59:17:0	#J677	#06252	PRINTER	CR212JOB,BATCH,ADMIN		1299	456	0	12	6	32	OK	0
13:00:13:7	#J681	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	7	11	6	32	OK	0
13:01:08:8	#J681	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	6	11	6	32	OK	0
13:02:07:3	#J681	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	5	11	6	32	OK	0
13:03:05:6	#J681	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	4	11	6	32	OK	0
13:04:01:3	#J681	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	3	11	6	32	OK	0
13:04:57:8	#J681	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	2	11	6	32	OK	0
13:05:35:1	#S2903	#06329	EDTLIST	HOWELLAC,STU84B		57	36	0	8	18	32	OK	0
13:05:48:7	#S2888	#06330	FTN82	WEISSHC,STU85B		51	40	0	8	18	32	OK	0
13:05:54:4	#J691	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	1	11	6	32	OK	0
13:06:50:8	#J691	#06277	PRINTER	CR210JOB,BATCH,ADMIN		764	384	0	11	6	32	OK	0
13:09:40:2	#J685	#I3720	$STDIN	UFBTCHCR,BUSENTRY,ADMIN	#S2798	9	8	0	0	11	0	OK	0
13:10:25:5	#J685	#06334	LP	UFBTCHCR,BUSENTRY,ADMIN		119	96	0	8	19	32	OK	0
13:10:31:0	#J685	#06333	$STDLIST	UFBTCHCR,BUSENTRY,ADMIN		36	36	0	8	19	32	OK	0
13:12:33:1	#J686	#I3721	$STDIN	FBTRL,RICHMOSL,STAFF	#S2904	25	12	0	0	11	0	OK	0
13:12:42:0	#J687	#I3722	$STDIN	FL9JOB,BATCH,ADMIN	#S2798	8	8	0	0	2	0	OK	0
13:13:02:3	#J686	#06335	$STDLIST	FBTRL,RICHMOSL,STAFF		15	32	0	8	6	32	OK	0
13:14:59:9	#S2881	#06300	STENOPLT	FILLADF,STAFF		166	68	0	8	24	32	OK	0
13:15:06:4	#J687	#06337	PRINT	FL9JOB,BATCH,ADMIN		260	176	0	8	19	32	OK	0
13:15:11:8	#J687	#06336	$STDLIST	FL9JOB,BATCH,ADMIN		35	32	0	8	19	32	OK	0
13:19:39:5	#S2888	#06340	FTN82	WEISSHC,STU85B		51	40	0	8	18	32	OK	0
13:19:48:4	#J688	#I3759	$STDIN	FBTRL,RICHMOSL,STAFF	#S2904	26	8	0	0	13	0	OK	0

DEPARTMENT OF REGIONAL ECONOMIC EXPANSION

OTTAWA

WED, JAN 6, 1982, 10:22 PM

LOGFILE SUMMARY FOR

LOG2345.PUB

TYPE NO.	TYPE	# RECORDS
0	LOG FAILURE	0
1	SYSTEM STARTUP	0
2	JOB INITIATION	86
3	JOB TERMINATION	76
4	PROCESS TERMINATION	735
5	FILE CLOSE	7732
6	SYSTEM SHUTDOWN	0
7	POWER FAILURE	0
8	SPOOLING LOG RECORD	232
9	LINE DISCONNECTION	0
10	LINE CLOSE	0
11	I/O ERROR	0
12	DISC PHYS MNT/DSMNT	0
13	DISC LOGICAL MNT/DSMT	0
14	LABELLED TAPE	0
		8861

START TIME: FRI, DEC 4, 1981, 12:05 PM

STOP TIME: FRI, DEC 4, 1981, 2:57 PM

SYSTEM RECORDS: 650 USER RECORDS: 8211

Whitman College Computer Services

Job Accounting System

Summary for: LOG2345.PUB

Start Time: FRI, DEC 4, 1981, 12:05 PM

Stop Time: FRI, DEC 4, 1981, 2:57 PM

TYPE NO.	TYPE	# RECORDS
0	LOG FAILURE	0
1	SYSTEM STARTUP	0
2	JOB INITIATION	86
3	JOB TERMINATION	76
4	PROCESS TERMINATION	735
5	FILE CLOSE	7732
6	SYSTEM SHUTDOWN	0
7	POWER FAILURE	0
8	SPOOLING LOG RECORD	232
9	LINE DISCONNECTION	0
10	LINE CLOSE	0
11	I/O ERROR	0
12	DISC PHYS MNT/DSMNT	0
13	DISC LOGICAL MNT/DSMT	0
14	LABELLED TAPE	0
		8861

SYSTEM Records: 650
USER Records: 8211
8861

Date Processed: WED, DEC 30, 1981, 5:26 PM

LOG2345,PUB

PAGE 1 DEPARTMENT OF REGIONAL ECONOMIC EXPANSION WED, JAN 6, 1982, 11:47 PM

SUMMARY REPORT FOR ADMIN FOR OCTOBER 1981

COST CENTRE:H42 GROUP:BUSINESS

JOB	DATE	TIME	JOBNAME	USER		CPU/S	CON/M	PROC	CD/SEG	SWAP			PROC-I/O COST	JOB COST
J685	4 /12/81	13:8	UFBTCHCR	BUSENTRY	D	12	2	4	31	810			$0.75	
				DISC:		26 FILES		1253 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		2 FILES		155 LINES		CARD READER:	0 FILES	0 RECORDS	$1.00	$1.75
J687	4 /12/81	13:12	FL9JOB	BATCH	D	8	2	5	49	492			$0.81	
				DISC:		17 FILES		320 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		2 FILES		295 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$0.81
J689	4 /12/81	13:29	UFBATCHO	BUSENTRY	D	8	2	4	23	691			$0.61	
				DISC:		24 FILES		489 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		2 FILES		132 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$0.61
J691	4 /12/81	13:40	UFUPDTCA	BUSENTRY	D	7	2	4	24	790			$0.62	
				DISC:		28 FILES		263 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		2 FILES		54 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$0.62
J692	4 /12/81	13:44	UFUPDTCA	BUSENTRY	D	8	2	4	24	790			$0.63	
				DISC:		28 FILES		250 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		2 FILES		64 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$0.63
J694	4 /12/81	13:45	GL1AJOB	BATCH	D	15	2	8	92	1382			$1.51	
				DISC:		41 FILES		396 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		3 FILES		227 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$1.51
J695	4 /12/81	13:49	GL1AJOB	BATCH	D	14	4	8	92	1136			$1.50	
				DISC:		41 FILES		524 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		3 FILES		241 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$1.50
J698	4 /12/81	13:57	GL1AJOB	BATCH	D	13	5	8	92	1136			$1.50	
				DISC:		41 FILES		278 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		3 FILES		162 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$1.50
J699	4 /12/81	14:1	UFUPDTCA	BUSENTRY	D	7	2	4	24	790			$0.62	
				DISC:		28 FILES		218 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		2 FILES		50 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$0.62
J700	4 /12/81	14:3	GL1AJOB	BATCH	D	25	4	8	92	1136			$1.66	
				DISC:		41 FILES		969 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		3 FILES		549 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$1.66
J701	4 /12/81	14:5	UFDSJENT	BUSENTRY	D	19	4	6	44	1093			$1.13	
				DISC:		36 FILES		2924 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		3 FILES		376 LINES		CARD READER:	0 FILES	0 RECORDS	$2.00	$3.13
J704	4 /12/81	14:9	FL1JOB	BATCH	D	9	3	5	53	465			$0.87	
				DISC:		12 FILES		313 BLOCKS		TERMINAL:	0 RECORDS			
				PRINTER:		1 FILES		34 LINES		CARD READER:	0 FILES	0 RECORDS	$0.00	$0.87

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SUMMARY REPORT FOR ADMIN FOR OCTOBER 1981

COST CENTRE:H42 GROUP:BUSINESS

JOB	DATE	TIME	JOBNAME	USER	G						PROC-I/O COST	JOB COST
BUSINESS GROUP TOTALS						361 CPU/SEC	78 CON/MIN	151 PROCESSES				
						1540 CODE/SEG	22718 SWAP	24 JOBS	0 SESSIONS			
						DISC: 786 FILES	19883 BLOCKS	TERMINAL:	0 RECORDS			
						PRINTER: 61 FILES	5980 LINES	CARD READER:	0 FILES	0 RECORDS		
						PROCESSING COSTS:	$28.48	I/O COSTS:	$9.00			
H42 COST CENTRE TOTALS						361 CPU/SEC	78 CON/MIN	151 PROCESSES				
						1540 CODE/SEG	22718 SWAP	24 JOBS	0 SESSIONS			
						DISC: 786 FILES	19883 BLOCKS	TERMINAL:	0 RECORDS			
						PRINTER: 61 FILES	5980 LINES	CARD READER:	0 FILES	0 RECORDS		
						PROCESSING COSTS:	$28.48	I/O COSTS:	$9.00			
ADMIN ACCOUNT TOTALS						361 CPU/SEC	78 CON/MIN	151 PROCESSES				
						1540 CODE/SEG	22718 SWAP	24 JOBS	0 SESSIONS			
						DISC: 786 FILES	19883 BLOCKS	TERMINAL:	0 RECORDS			
						PRINTER: 61 FILES	5980 LINES	CARD READER:	0 FILES	0 RECORDS		
						PROCESSING COSTS:	$28.48	I/O COSTS:	$9.00			

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COST CENTRE: --- GROUP: --------

SUMMARY REPORT FOR ADMIN FOR OCTOBER 1981

JOB	DATE	TIME	JOBNAME	USER	Q	CPU/S	CON/M	PROC	CD/SEG	SWAP	PROC-I/O COST	JOB COST

	NAME	JOBS (COUNT)	JOBS COST	SESSIONS (COUNT)	SESSIONS COST
USER TOTALS:	BUSENTRY	8	$16.17	0	$0.00
	BATCH	16	$21.31	0	$0.00

	NAME	JOBS (COUNT)	JOBS COST	SESSIONS (COUNT)	SESSIONS COST
JOB TOTALS:	UFBTCHCR	1	$1.75	0	$0.00
	FL9JOB	2	$1.57	0	$0.00
	UFBATCHO	1	$0.61	0	$0.00
	UFUPDTCA	3	$1.87	0	$0.00
	GL1AJOB	11	$17.07	0	$0.00
	UFDSJENT	1	$3.13	0	$0.00
	FL1JOB	1	$0.87	0	$0.00
	FL2JOB	2	$1.80	0	$0.00
	UFDISTAR	1	$1.49	0	$0.00
	UFUPDTPY	1	$7.32	0	$0.00

H-P PROCESSING INVOICE FOR COST CENTRE H42, OCT 1981
WED, JAN 6, 1982, 11:43 PM

ACCOUNT	GROUP	COST
	PUB	$1.53
AAA		$1.53
	BUSINESS	$37.48
ADMIN		$37.48
	COMMON	$5.38
	PUB	$1.81
FINDEV		$7.19
	FILLADF	$4.70
	RICHMOSL	$4.70
STAFF		$9.40
	GILLILLK	$10.66
	HANFORET	$6.69
	RITCHEKO	$5.21
STU82		$22.56
	HODELDB	$49.00
	ROSIKSL	$2.56
STU83		$51.56
	PENGRADB	$2.03
STU84		$2.03
	COTTREFM	$63.16
	HANSONJA	$1.11
	HOWELLAC	$0.38
	HURSTSA	$41.55

```
TIME  TYPE       JOB#    * * * * * * * * * * * * * * FRI, DEC  4, 1981 * * * * * * * * * * * * * * * * * * * * * * * * * * * LOG2345 * *

12:55 FILE CLOSE #S2883 LDEV=13  MDISC  B1       .COTTREFM,STU84B    #RECORDS=69          #BLOCKS=23
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=24
12:55 FILE CLOSE #S2883 LDEV=5   MDISC  K3381255.COTTREFM,STU84B    #RECORDS=90          #BLOCKS=19
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=224
12:55 SPOOL FILE #J677  #06252 PRINTER  CR212JOB,BATCH    ,ADMIN    COPIES=3   ,PRI=12,RECS=1299      ,SECTORS=456
12:55 FILE CLOSE  SYS   LDEV=3   MDISC          ,BATCH    ,ADMIN    #RECORDS=1297        #BLOCKS=107
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=456
12:55 FILE CLOSE #J553  LDEV=1   MDISC  COMPDATA.PUB      ,SYS      #RECORDS=2           #BLOCKS=6
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=25
12:55 FILE CLOSE #J553  LDEV=1   MDISC  COMPDATA.PUB      ,SYS      #RECORDS=2           #BLOCKS=6
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=25
12:56 PROCESS    #S2885   0 PROG-SEGMENTS,   0 SL-SEGMENTS,   166 VIRTUAL-MEM-SECTORS, MAX-STACK(WRDS)=2772 ,MAX-XDS(SECTORS)=14
12:56 FILE CLOSE #S2885 LDEV=5   MDISC  UDCSTU   .PUB      ,IRIS     #RECORDS=72          #BLOCKS=11
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=24
12:56 FILE CLOSE #S2885 LDEV=13  MDISC  SYSUDC   .PUB      ,SYS      #RECORDS=93          #BLOCKS=6
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=35
12:56 FILE CLOSE #S2885 LDEV=11  MDISC  $OLDPASS,HANFORET,STU82     #RECORDS=0           #BLOCKS=0
                                       DOMAIN:  NEW          DISPOSITION:  DELETE        #SECTORS=10
12:56 JOB TERM   #S2885    12 PROCESSES RUN,          25 CPU SEC USED,          14 ELAPSED MINUTES
12:56 FILE CLOSE #S2885 LDEV=47  TERM   $STDLIST,        ,                   #RECORDS=816         #BLOCKS=816
12:56 FILE CLOSE #S2885 LDEV=17  TERM   $STDIN   .       .                   #RECORDS=816         #BLOCKS=816
**JOB SUMMARY ** #S2885 LDEV=47  HANFORET,STU82   12:42-12:56 PROG-RUNS=13   STACK:      8240=MAX,      5360=AVG; CPU=25        0=CS
                        TRANSFERRED       27 RECORDS TO DEVICE 1   MOVING HEAD DISC
                        TRANSFERRED      635 RECORDS TO DEVICE 2   MOVING HEAD DISC
                        TRANSFERRED      447 RECORDS TO DEVICE 3   MOVING HEAD DISC
                        TRANSFERRED      409 RECORDS TO DEVICE 5   MOVING HEAD DISC
                        TRANSFERRED      469 RECORDS TO DEVICE 11  MOVING HEAD DISC
                        TRANSFERRED      591 RECORDS TO DEVICE 13  MOVING HEAD DISC
                        TRANSFERRED       37 RECORDS TO DEVICE 18  LINE PRINTER
                        TRANSFERRED    21049 RECORDS TO DEVICE 47  TERMINAL
12:56 FILE CLOSE #S2883 LDEV=5   MDISC  B1       .COTTREFM,STU84B    #RECORDS=0           #BLOCKS=0
                                       DOMAIN:  NEW          DISPOSITION:  NO CHANGE     #SECTORS=5
12:56 FILE CLOSE #S2883 LDEV=13  MDISC  B1       .COTTREFM,STU84B    #RECORDS=0           #BLOCKS=0
                                       DOMAIN:  OLD          DISPOSITION:  DELETE        #SECTORS=24
12:56 FILE CLOSE #S2883 LDEV=5   MDISC  K3381255.COTTREFM,STU84B    #RECORDS=89          #BLOCKS=16
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=224
12:56 FILE CLOSE #S2883 LDEV=11  MDISC  B1       .COTTREFM,STU84B    #RECORDS=69          #BLOCKS=23
                                       DOMAIN:  NEW          DISPOSITION:  SAVE          #SECTORS=24
12:56 FILE CLOSE #S2883 LDEV=5   MDISC  K3381255.COTTREFM,STU84B    #RECORDS=108         #BLOCKS=12
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=224
12:56 FILE CLOSE #S2883 LDEV=5   MDISC  K3381255.COTTREFM,STU84B    #RECORDS=3           #BLOCKS=3
                                       DOMAIN:  OLD          DISPOSITION:  DELETE        #SECTORS=224
12:56 PROCESS    #S2883  12 PROG-SEGMENTS,   0 SL-SEGMENTS,   133 VIRTUAL-MEM-SECTORS, MAX-STACK(WRDS)=8240 ,MAX-XDS(SECTORS)=14
12:56 FILE CLOSE #S2883 LDEV=61  TERM   $STDIN   .       .                   #RECORDS=2054        #BLOCKS=2054
12:56 FILE CLOSE #S2883 LDEV=61  TERM   $STDLIST.        .                   #RECORDS=2054        #BLOCKS=2054
12:56 FILE CLOSE #S2883 LDEV=61  TERM   EDITOUT  .       .                   #RECORDS=2054        #BLOCKS=2054
12:56 FILE CLOSE #S2883 LDEV=61  TERM   EDITIN   .       .                   #RECORDS=2054        #BLOCKS=2054
12:56 FILE CLOSE #S2883 LDEV=5   MDISC  FORTRAN  .PUB     ,SYS      #RECORDS=15          #BLOCKS=15
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=384
12:56 FILE CLOSE #S2883 LDEV=5   MDISC  FTNUSL   .COTTREFM,STU84B    #RECORDS=0           #BLOCKS=0
                                       DOMAIN:  NEW          DISPOSITION:  NO CHANGE     #SECTORS=11
12:56 SPOOL FILE #J677  #06252 PRINTER  CR212JOB,BATCH    ,ADMIN    COPIES=2   ,PRI=12,RECS=1299      ,SECTORS=456
12:56 FILE CLOSE  SYS   LDEV=3   MDISC          ,BATCH    ,ADMIN    #RECORDS=1297        #BLOCKS=107
                                       DOMAIN:  OLD          DISPOSITION:  NO CHANGE     #SECTORS=456
12:56 FILE CLOSE #S2883 LDEV=11  MDISC  $NEWPASS,COTTREFM,STU84B    #RECORDS=17          #BLOCKS=17
                                       DOMAIN:  NEW          DISPOSITION:  NO CHANGE     #SECTORS=201
```

```
TIME  TYPE       JOB:   * * * * * * * * * * * * * FRI, DEC  4, 1981 * * * * * * * * * * * * * * * * * * * * * * * * * LOG2345 * *

12:57 FILE CLOSE #S2890 LDEV=11  MDISC  GUARD11 ,GUARD    ,IRIS      #RECORDS=1           #BLOCKS=1
                                       DOMAIN:  OLD         DISPOSITION:  NO CHANGE    #SECTORS=468
12:57 FILE CLOSE #S2890 LDEV=13  MDISC  GUARD12 ,GUARD    ,IRIS      #RECORDS=1           #BLOCKS=1
                                       DOMAIN:  OLD         DISPOSITION:  NO CHANGE    #SECTORS=30
12:57 FILE CLOSE #S2890 LDEV=13  MDISC  GUARD13 ,GUARD    ,IRIS      #RECORDS=1           #BLOCKS=1
                                       DOMAIN:  OLD         DISPOSITION:  NO CHANGE    #SECTORS=64

      0 LOG FILE ERRORS
     10 JOB INITIATIONS
     12 JOB TERMINATIONS
    111 PROCESS COMPLETIONS
   1295 FILE CLOSES
     31 SPOOFLE FINISHED
```

12/ 4/81 THRU 12/ 4/81 ANALYZED ON WED, JAN 6, 1982, 12:08 AM

USER.ACCOUNT	# JOBS	# SESN	CONNECT HOURS	CPU TIME (HOURS) BS	CS	DS	ES	PRIME	TOTAL	STACK MAX	STACK AVE	# PROC	DISC RECORDS	PRINTER LINES	MAG TAPE RECORDS	READR CARDS	PUNCH CARDS
MANAGER .AAA	0	1	.20		.01			.01	.01	5871	4321	2	126.	0	0	0	0
WINTERJ .FAC	0	1	2.32					.00	.11	13237	5075	4	5098.	5579	0	0	0
HAMFORET.STUR2	0	1	.23		.01			.01	.01	8240	5360	13	2578.	37	0	0	0
WEISSHC .STU85B	0	2	.33		.01			.01	.01	8240	5591	8	11327.	235	0	0	0
NYHAGEN .CCS	0	1	.10		.00			.00	.00	5558	4165	2	329.	0	0	0	0
@ .@	0	6	3.18		.02			.02	.13	13237	5229	29	19458.	5851	0	0	0

! SUMMARY OF I/O ERRORS !

BETWEEN FRI, DEC 4, 1981, 12:05 PM - FRI, DEC 4, 1981, 2:57 PM
THERE WERE 0 POWER FAILURES
THE SYSTEM WAS SHUT DOWN 0 TIMES
THE SYSTEM WAS RESTARTED 0

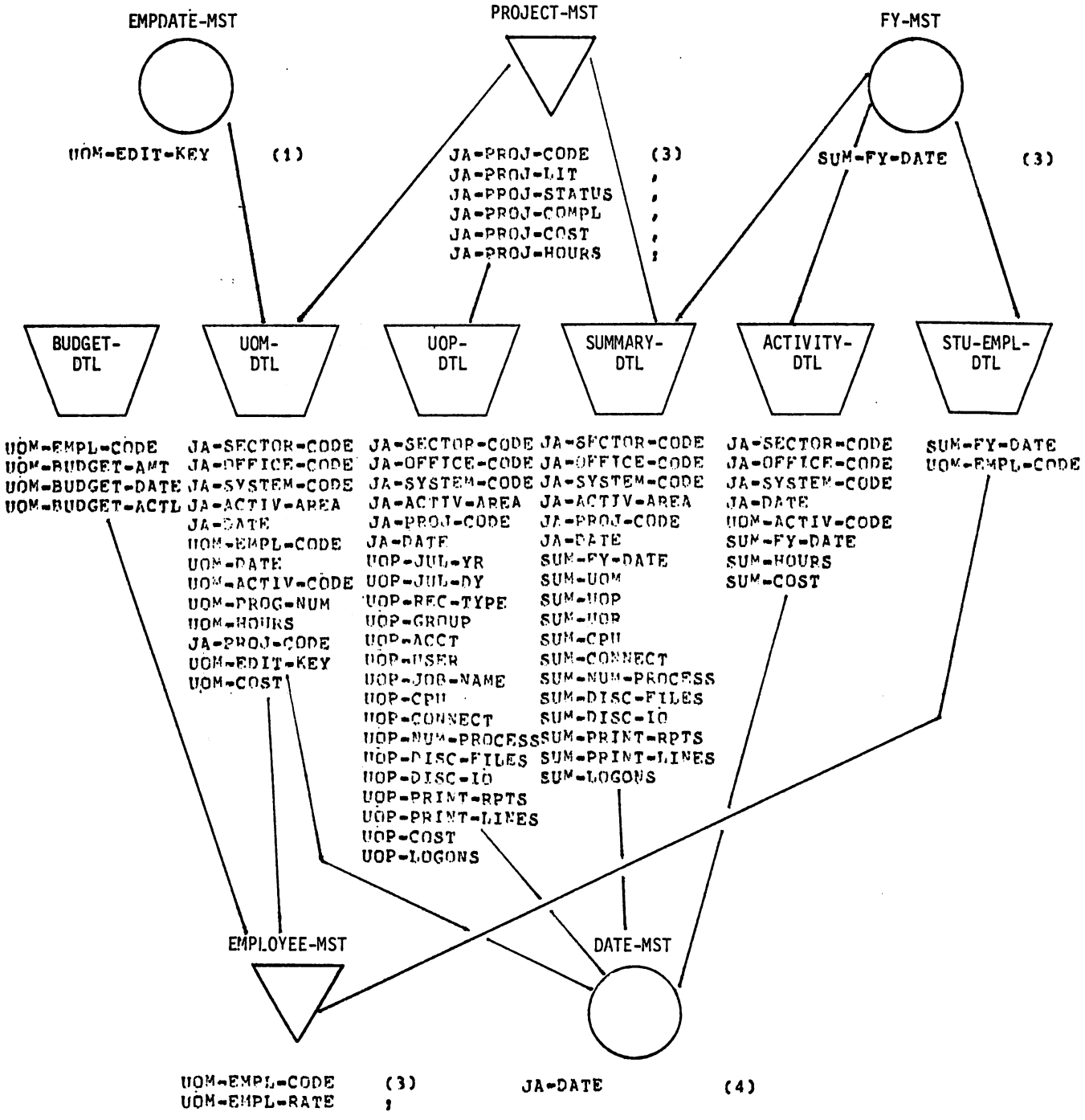
REPORT FROM SUMMARY FILE FILESUM.LOGFILES.SYS FRI, DEC 4, 1981, 12:05 PM TO FRI, DEC 4, 1981, 12:57 PM
WED, JAN 6, 1982, 12:06 AM SHORT FILE ACTIVITY REPORT BY FILE NAME PAGE 1

FILE/USER NAME	DISPOSITION	LDN	SECTORS	CLOSES:TTL	JOBS	SESS	REC-USE:TTL	JOBS	SESS	BLKS:-TTL	JOBS	SESS
CATALOG.PUB.SYS	PERM,SAME	1	910	4		4	576		576	36		36
COMMAND.PUB.SYS	PERM,SAME	3	168	9		9	41		41	34		34
CONFDATA.PUB.SYS	PERM,SAME	1	25	52	52		104	104		312	110	
EDITOR.PUB.SYS	PERM,SAME	2	289	29		29	261		261	261		261
FORTRAN.PUB.SYS	PERM,SAME	5	384	15		15	225		225	225		225
LOG2344.PUB.SYS	PERM,SAME	11	2046	1			8326			1022		
LOG2345.PUB.SYS	NEW,PERM	11	128	1			0			0		
QUERY.PUB.SYS	PERM,SAME	13	371	2		1	156		34	156		34
SEGPROC.PUB.SYS	PERM,SAME	1	144	17		17	153		153	153		153
SPL.PUB.SYS	PERM,SAME	2	372	19		10	1965		300	1965		300
SPLINTR.PUB.SYS	PERM,SAME	3	133	10		10	78		78	74		74
SYSUDC.PUB.SYS	PERM,SAME	13	35	12	2	10	1123	193	930	73	200	60

APPENDIX B

Table of Contents

The DIARY Data Base



Appendix B - I.1

91	M.A.R.C.U.S. Utilities System
AD	Student Admissions System
AL	Alumni Records System
AP	Accounts Payable System
AR	Accounts Receivable
AS	Academic Support System
AT	Art
AY	Astronomy
BD	Budget Analysis System
BG	Beacon/Guardian System
BI	Biology
BP	Bibliographic Retrieval System
CG	Class Grading System
CH	Chemistry
CL	Contact Log System
CO	General Purpose Consulting System
CR	Class Registration System
CS	Central Supply Inventory System
DR	Drama
EC	Economics
ED	Education
EN	Environmental Studies
ER	Employee Records System
FA	Student Financial Aid System
FD	Financial Development System
FL	FISL Maintenance System
FS	Freshman Seminar
GE	Geology
GL	General Ledger System
GR	Gift Records System 07/02/81-06/30/82
HI	History
IB	Interdepartmental Billing System
JA	TROIKA -- HP3000 Computer Job Accounting
LA	Languages
LC	Library Circulation System
MA	Mathematics
ML	Central Mailing System
MU	Music
NL	NDL Maintenance System
OH	Overhead
PC	Psychology
PE	Physical Education
PH	Philosophy
PS	Political Science
PT	General Plotter/Graphics System
PY	Payroll System
PZ	Physics
RE	Religion
SA	Sociology/Anthropology
SC	Treasurer's Securities System.
SH	Student Housing System

Whitman College Computer Center
Staff Activity Report

Date	09/07/81
ID	G4

Name: [signature]

Activity	# Hours	Project	Comments
TAI20	3.5		Testing
OH-M	1.0		Staff meeting
CG-MA	3.5	13281	Analysis w/ Buck, Bob, Wayne
AD-PS	.5		Fire fighting - Admissions
Total Hours	8.5		

Appendix B - II.2

Type of Work	Staff Activity Report		Corr. Job/Session Logon
PRODUCTION	SS-PS*	SS-G	PYDDDnSS (after sys install)
	SS-K	SS-TS	SSPROD (before or after inst)
	OH-A	OH-AM	SSnnnJOB (after sys install)
	OH-SM	OH-C	
	OH-T	OH-S	
	OH-VS	OH-M	
DEVELOPMENT	SS-P**	SS-SA**	DYDDDnSS (after sys. install)
	SSnnn**	SS-D**	SSDEV (before installed)
MAINTENANCE	SS-MA	SS-D***	MYDDDnSS
	SS-P***	SSnnn***	SSLOOK (after sys install)

Underlining indicates literal value

* - SR number may accompany activity code

** - abscence of SR number implies development on uninstalled sys

***-- SR number must accompany activity code

General Format of Service Request (SR) numbers : XYDDDNSS, where

X= "D" (development)
"M" (maintenance) or
"P" (production)

Y= "0" through "9", the current year of the decade in which SR was approved

DDD= Julian day of the year Y

N= sequence number of an SR recieved on the Julian day

SS= any valid system code, indicating the system in which work is being performed on behalf of SR

The other logons SSLOOK, SSDEV, and SSPROD are appropriate where SRs are not, as shown above.

LOGON # : #SR79 JAFROD
REPORT : JA323/F906
PRIVACY : CONFIDENTIAL
RPT DATE: 07/08/81

Whitman College Computer Center

Monthly Manpower Summary by Employee

USER: MANAGER
RUN DATE: 07/08/81
RUN TIME: 11:06:39
PAGE: 10

******* January 1981 - June 1981 *******

Amy Galpin

Manhours	%	Code	Activity
89.5	25.2	CL103	Contact Log System Programming
28.0	7.8	CL310	Contact Log System Programming
.5	.1	CL408	Contact Log System Programming
28.0	7.8	JA-AM	Job Accounting System Shop Management/Meeting
1.0	.2	JA-C	Job Accounting System Computer Operation
25.0	7.0	JA-K	Job Accounting System Key Entry/Clerical Support
14.0	3.9	JA-MA	Job Accounting System Maintenance Analysis/Meeting
5.5	1.5	JA***	Job Accounting System Programming
8.0	2.2	JA-SA	Job Accounting System System Design/Analysis/Meetin
2.0	.5	JA-T	Job Accounting System Trainng/Education/Professiona
6.0	1.6	OH-G	Overhead General Activities
64.0	18.0	OH-MA	Overhead Maintenance Analysis/Meeting
21.0	5.9	OH***	Overhead Programming
43.0	12.1	OH-T	Overhead Trainng/Education/Professiona
4.0	1.1	OH-TS	Overhead Technician Support
10.5	2.9	SR170	Student Records System Programming
4.0	1.1	SR175	Student Records System Programming
.5	.1	UT-MA	Computer Center Utilities Maintenance Analysis/Meeting
.5	.1	UT145	Computer Center Utilities Programming

355.0 Total Manhours

LOGON # : #S400/#S31
REPORT : JA405/F602
PRIVACY : CONFIDENTIAL
RPT DATE: 01/03/82

TROIKA -- HP3000 Computer Job Accounting
Whitman College Computer Center

F602 - UOP Monthly Summary by Area

Actual Usage for December , 1981

USER: GALPIN
RUN DATE: 01/03/82
RUN TIME: 19:45:49
PAGE: 1

	# RUNS	CON/M	CPU/S	# RPTS	PRINT LINES	# FILES	DISC I/O
Administrative Production							
Admissions Office	117	1,354	2,251	124	6,958	1,268	62,260
The Registrar	247	5,566	4,377	91	68,800	1,612	203,282
Financial Aid Services	11	31	194	2	2,815	59	11,236
Financial Development	388	2,091	15,381	104	102,456	2,348	878,625
Housing Office	3	40	8	1	20	27	187
Business Office	1,168	3,004	5,269	424	64,670	7,341	378,390
Subtotal	1,934	12,086	27,480	746	245,719	12,655	1,533,980
Academic Support							
Faculty	533	4,410	7,969	123	38,186	4,890	231,282
Students	5,593	21,349	22,100	859	102,119	30,887	568,780
Curriculum/Organizations	218	947	788	15	1,511	1,072	15,979
Subtotal	6,344	26,706	30,857	997	141,816	36,849	816,041
Computer Services							
Software Development	969	6,273	9,780	269	137,450	6,834	257,619
Overhead Support	387	2,965	5,380	142	37,693	2,417	79,890
Subtotal	1,356	9,238	15,160	411	175,143	9,251	337,509
Miscellaneous							
HP Users Group	1	1	1	0	0	1	2
Other	0	0	0	0	0	0	0
Subtotal	1	1	1	0	0	1	2
Total for Month	9,635	48,031	73,498	2,154	562,678	58,756	2,687,532
Batch Jobs	1,563	2,338	26,672	721	330,134	8,577	1,421,646
Interactive Terminal Sessions	8,072	45,693	46,826	1,433	232,544	50,179	1,265,886

LOGON # : #S400/#S31
REPORT : JA405/F602
PRIVACY : CONFIDENTIAL
RPT DATE: 01/03/82

TROIKA -- HP3000 Computer Job Accounting
Whitman College Computer Center

F602 - UOP Monthly Summary by Area

Percentage Usage for December , 1981

USER: GALPIN
RUN DATE: 01/03/82
RUN TIME: 19:45:50
PAGE: 2

	# RUNS	CON/M	CPU/S	# RPTS	PRINT LINES	# FILES	DISC I/O
Administrative Production							
Admissions Office	1.2	2.8	3.0	5.7	1.2	2.1	2.3
The Registrar	2.5	11.5	5.9	4.2	12.2	2.7	7.5
Financial Aid Services	.1	.0	.2	.0	.5	.1	.4
Financial Development	4.0	4.3	20.9	4.8	18.2	3.9	32.6
Housing Office	.0	.0	.0	.0	.0	.0	.0
Business Office	12.1	6.2	7.1	19.6	11.4	12.4	14.0
Subtotal	20.0	25.1	37.3	34.6	43.6	21.5	57.0
Academic Support							
Faculty	5.5	9.1	10.8	5.7	6.7	8.3	8.6
Students	58.0	44.4	30.0	39.8	18.1	52.5	21.1
Curriculum/Organizations	2.2	1.9	1.0	.6	.2	1.8	.5
Subtotal	65.8	55.6	41.9	46.2	25.2	62.7	30.3
Computer Services							
Software Development	10.0	13.0	13.3	12.4	24.4	11.6	9.5
Overhead Support	4.0	6.1	7.3	6.5	6.6	4.1	2.9
Subtotal	14.0	19.2	20.6	19.0	31.1	15.7	12.5
Miscellaneous							
HP Users Group	.0	.0	.0	.0	.0	.0	.0
Other	.0	.0	.0	.0	.0	.0	.0
Subtotal	.0	.0	.0	.0	.0	.0	.0
Total for Month	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Batch Jobs	16.2	4.8	36.2	33.4	58.6	14.5	52.8
Interactive Terminal Sessions	83.7	95.1	63.7	66.5	41.3	85.4	47.1