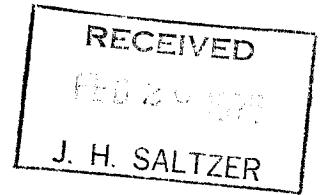




Student Information Processing Board
Massachusetts Institute of Technology
Room 39-200
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Cambridge, Massachusetts 02139



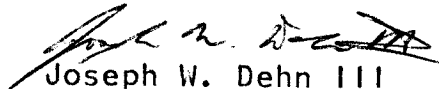
20 February 1975

Dear Prof. Saltzer:

As you know, discussions are currently taking place regarding proposals to reduce the deficit of the Information Processing Center, including the termination of Multics service. In the enclosed statement we would like to present some of the Board's thoughts regarding this proposal.

If you have any comments or questions, we would be very interested in hearing from you. Please feel free to call me or any Board member at x3-7788.

Sincerely yours,


Joseph W. Dehn III
Chairman, S.I.P.B.

Enc.

Comments on a Proposal to Terminate Multics Service

We understand that due to budgetary problems and under-utilization of the facilities of the MIT Information Processing Center (IPC) there is currently consideration of proposals for reducing the deficit of the center. One such proposal is the termination of the Multics service at MIT. We wish to present some thoughts on the usage of Multics at the Institute and the consequences of the termination of this service.

The SIPB's primary purpose is to lower the barriers to the use of computers by students for independent research projects, computer education, problem solving, and student activities. The user group that we fund is varied and uses many of the facilities of Multics such as languages, editors, and subsystems. With over two hundred users registered on Multics each year (and a comparable number on the IBM 370/168), we have built up experience in the patterns of usage by this type of user and in the administration of a large number of small accounts.

As a system for the new user to learn, Multics presents an easier environment and use. Among the least of the many advantages over the IBM 370 are higher level language debuggers, a choice of text editors, and more intelligible error messages. These messages and the debuggers pinpoint the location of errors so that the new user can do simple debugging with minimal training. More important are the sophisticated features of Multics which give the non-computer oriented student a better feeling for the tasks that a computer could potentially do for him. The wide variety of languages, debuggers, and editors allow users from different backgrounds to use familiar features while learning new ones. Since our purpose is to further computer education and usage, we feel that this view of a computer system is more enlightening than the less powerful but more complex bare-bones operating systems to be found on most other machines, such as the IBM 370. The administrative tools and the dynamic linking features of Multics allow us to provide specialized environments for naive users. Moreover, we can provide extra libraries of useful functions which are not supported by IPC and special commands which are tailored for the situation and perhaps simpler to use than those designed for more sophisticated users.

The administration of a large number of small user accounts is considerably easier on Multics than on other systems. Most of the necessary work can be done by the project administrator, without involving the IPC User Accounts Office. This gives flexibility in dealing with the day to day requirements of our users. Through the accounting system on Multics we can control and monitor the spending of users (and prevent excess overspending) as well as allocate more funds quickly when needed. It is currently not possible to prevent overruns on the IBM 370,

and will not be in the foreseeable future.

The access mechanisms and directory structure of Multics allow us to examine user files to give assistance with writing and debugging programs. The administration of the accounts is also simplified since we can control the amount of disk storage allowed to a user and delete old files after an account is terminated or its funds exhausted. The storage system also provides backup in case of system failure or user error. The IBM 370 does not provide backup or control of this sort and IPC policy in regard to access control denies the ability to look at a user's files to give him assistance.

One of our major services is the "Educational Calculator System" (ECS), a calculational problem solving subsystem running under Multics. It provides an easy to use environment for lab calculations, problem sets, and similar situations, and includes such capabilities as array handling and plotting. This subsystem would be difficult to support and control with the administrative tools on the IBM 370. Anonymous (non-registered) users, control over logons, and spending control are some of the facilities on Multics which make the support and administration of such service reasonable to do. Extended facilities can also be added to ECS on Multics with dynamic linking. The ability to write functions in other languages to add features to the system is supported by the runtime support features common to the languages. Generalized graphics facilities are available on Multics with well defined ways to support new devices with a minimum of effort. The usefulness of the features of ECS came about largely because of the relative ease of implementation and support on Multics. This system represents a considerable investment in software over the past two years which cannot be moved.

Multics is a good environment for the development of programs and systems. Student activities which depend on volunteer labor to operate achieve more with the same amount of time and effort on this system than they would on another system. TCA's course evaluation program was developed on Multics; the planned indexing system for the MITSFS library is being designed on it. For ourselves, the availability of a system which is easy to program helps people work on the support of our systems and services, and increases the speed with which development work gets done.

Beyond the student activities there are other research and development projects which have investments in Multics and rely on the unique environment it provides. MACSYMA, LISP, DISCOURSE, CASCON, TICS, the Consistent System, and RDMS are all available only on Multics and are all subsystems which depend on the directory structure, virtual storage/address space and access mechanisms of Multics. These systems are useful to MIT as development projects (which may well not have been undertaken without the Multics environment) and to the user community

(ourselves and the users we fund included) as software products to use for application purposes. Aside from these large projects there are smaller groups doing computation which have decided on Multics as the more tractable system to use and would have to invest more time and money (which they may not have available) to convert their programs.

It should be considered that the removal of Multics service would not be an isolated one-time act. Several times in the past significant services have been terminated. In the past, when such services as CTSS and CP/67 were terminated many users were forced to abandon investments. Some found the change of machines to be too great and either abandoned IPC as a source of computer resources or abandoned their project. Recent reductions in the hours of service have also reduced user confidence. While the financial or technical basis for those actions may have been sound, perhaps long range effects on the users have been overlooked.

The removal of Multics would be the final blow. The result of these reductions in service (including the removal of Multics) would give a large portion of the users at the Institute recent first hand experience with IPC having pulled a system, service or hour of service from under them. It would be clear that central computing facilities at MIT have little continuity and cannot be relied on. Already, for various reasons, many user groups have turned to private computers or outside systems to satisfy their computer requirements (e.g. The Joint Computer Facility, Sloan School, the Math Department, CAES, Chemical Engineering Department -- all of whom use their own facilities primarily for functions the IPC can provide). Lack of confidence will lead others to join them.

The point is that further curtailment of the computer services by IPC should be considered more than just another change of system. MIT would be poorer for having only one computer facility on campus available to the general user. Large users may have the option of using outside facilities or purchasing their own computer, but the small users such as we represent are limited to on-campus facilities. If the financial situation is so bad that services cannot be continued at their present level, then it is time to reexamine the entire subject of computing at MIT.

It is time to start at the beginning and determine what the MIT community needs in the way of computing. Both the needs of the community and the economics of computers have changed significantly, and the traditional solutions of large central installations may or may not be the best. In the meantime we must take care to do the best we can with this approach and not allow the educational function of the Institute to be impaired by lack of facilities.